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Asthma and Asthma-Related Health Care for Children Enrolled in HUSKY A: 2006

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PURPOSE

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

This report is the ninth annual report on asthma and asthma-related health care in HUSKY A (Medicaid managed care).[1]

METHODS

Study Population

Children under 21 years who were continuously enrolled in any HUSKY A plan between January 1 and December 31, 2006 were included in the study sample.[2]

Data

HUSKY A enrollment data files were searched to determine which children were continuously enrolled for the one-year period. HUSKY A encounter records were searched for records corresponding to outpatient, inpatient, and emergency care with a primary diagnosis of asthma (ICD-9-CM code 493.0-493.9). HUSKY pharmacy data were searched for prescriptions for any one of the medications on a list developed by the National Committee for Quality Assurance for managed care plan performance monitoring.[3] To determine hospital and emergency department

[1] 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 between the Connecticut Department of Social Services and the Hartford Foundation for Public Giving, with a grant from the Hartford Foundation to Connecticut Voices. Connecticut Voices for Children contracts with MAXIMUS, Inc. for data management and data analysis. This report was prepared by Mary Alice Lee, Ph.D., Karen M. Sautter, M.P.H., and Amanda Learned, B.A. This publication does not express the views of the Department or the State of Connecticut. The views and opinions expressed are those of the authors. This report and earlier reports are available online at www.ctkidslink.org.

[2] 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.

[3] National Committee for Quality Assurance. HEDIS 2006. Healthcare Effectiveness data & information set. Vol. 2, Technical specifications. Washington (DC): National Committee for Quality Assurance; 2005.

(ED) follow up rates, encounter records were also searched for care for related respiratory conditions.[4]

Measure of Asthma Prevalence

For 2006, the prevalence of asthma was estimated by determining the percentage of all continuously enrolled children who received *any care for a primary diagnosis of asthma or any prescriptions for medication used to control or treat asthma*. This approach to estimating prevalence represents a change from the method used in earlier reports where prevalence was based on children who had a primary or secondary diagnosis of asthma; children with prescriptions alone were not counted. This change was made to make these findings more comparable to asthma prevalence reported in other states that use Medicaid claims data to track asthma.

In addition, the subset of children who had persistent asthma was determined. The National Committee for Quality Assurance (NCQA) criteria for determining that children had persistent asthma were modified for this study.[5] For the purpose of monitoring the quality of asthma care, NCQA defines persons with persistent asthma as those who had at least one hospital admission OR at least one emergency visit for treatment of asthma OR at least four outpatient visits plus at least two prescriptions OR at least four prescriptions for treatment of asthma. However, NCQA specifications require that these criteria are met in the current and previous measurement year, whereas our definition only includes the current measurement year.

Measures of Utilization and Quality

Health care utilization was described in terms of the number of visits for ambulatory care with an asthma diagnosis (average, range), percentage of children with more than one office or clinic visit for asthma-related care, and percentages of children with ED visits and hospitalizations for treatment of asthma.

The National Heart, Lung and Blood Institute recommends that children with asthma should be seen regularly (about every 6 months for mild intermittent or mild persistent asthma that has been under control for 3 months or more with more frequent visits for uncontrolled asthma or moderate to severe persistent asthma) in order to prevent recurrent exacerbations of asthma and to minimize the need for ED visits or hospitalizations.[6]

The seasonality of office visits and emergency visits was also described by plotting the number of visits by weeks of the year.

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[4] Asthma-related diagnoses: bronchitis (ICD-9-CM codes 466, 480), bronchioloitis (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).

[5] Criteria for the HEDIS definition of persistent asthma are described in: National Committee for Quality Assurance. HEDIS 2006. Healthcare Effectiveness data & information set. Vol. 2, Technical specifications. Washington (DC): National Committee for Quality Assurance; 2005.

[6] National Heart, Lung, and Blood Institute. Guidelines for diagnosis and management of asthma. Bethesda, MD: NHLBI, 2007; p. 67. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/.

The National Heart, Lung and Blood Institute recommends that children who were seen for emergency care or discharged after hospitalization for treatment of asthma should be seen for follow-up within 1 to 4 weeks.[7] The percentage of children who received timely follow-up (an office or clinic visit within two weeks of an ED visit or hospital discharge) for asthma or related respiratory diagnoses following an emergency visit or hospital discharge was determined overall and by managed care plan for the first emergency visit or hospital discharge for each child.

The percentage of children with persistent asthma who received treatment with long-term control medications (i.e., preferred therapies), according to a measure developed by NCQA and modified for this study, was determined overall, by age, and by managed care plan.[8] Changes from NCQA specifications included: focus on children only, assumption that each medication dispensing event was for a 30-day supply, and inclusion of children with at least four asthma medication dispensing events even if leukotriene modifiers were the sole asthma medication dispensed.[9]

Limitations of the Data

Treatment 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 when based on health service utilization. Second, the completeness and accuracy of the encounter data could not be assessed. What may appear to be increases or decreases in prevalence and utilization over time can be due in part to changes in the quality of data submissions. Third, depending on the data source, prevalence estimates can vary significantly.[10,11,12,13] Fourth, the accuracy of the diagnosis, the severity of the condition, and the appropriateness of clinical care cannot be assessed using administrative data alone. Fifth, the data available for these analyses do not include records of phone contacts with providers, case management, or other services that do not typically result in submission of an encounter record. Despite these limitations, this approach

[7] National Heart, Lung, and Blood Institute. Guidelines for diagnosis and management of asthma. Bethesda, MD: NHLBI, 2007; 401. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/.

[8] National Committee for Quality Assurance. Use of appropriate medications for people with asthma. HEDIS 2005, volume 2: technical specifications. Washington, DC: NCQA, 2005.

[9] Ways in which HEDIS specifications were modified for this study: no look back to previous year for identification of children with persistent asthma; no check of amount of prescription medication dispensed; inclusion of children with at least four asthma medication dispensing events even if leukotriene modifiers were the sole asthma medication dispensed. NCQA HEDIS criteria include children 5 and older. Criteria for the HEDIS definition of persistent asthma are described in: National Committee for Quality Assurance. HEDIS 2006. Healthcare Effectiveness data & information set. Vol. 2, Technical specifications. Washington (DC): National Committee for Quality Assurance; 2005.

[10] Dombkowski KJ, Wasilevich EA, Lyon-Callo SK. Pediatric asthma surveillance using Medicaid claims. Public Health Reports, 2005; 120: 515-524.

[11] 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.

[12] Children's Health Council. Asthma and asthma-related health care for Children in HUSKY A: FFY 2002. Hartford, CT: CHC, 2003.

[13] Twiggs JE, Fifield J, Apter AJ, Jackson EA, Cushman RA. Stratifying medical and pharmaceutical administrative claims as a method to identify pediatric asthma patients in a Medicaid managed care organization. Journal of Clinical Epidemiology, 2002; 55: 938-944.

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.[14]

RESULTS

Description of the Study Population

There were 157,178 children under 21 who were continuously enrolled in HUSKY A in 2006, an 8 percent decrease over 2005 (169,580 children were enrolled in 2005). The sociodemographic and enrollment characteristics of these children are described in Table 1.

Estimated Prevalence of Pediatric Asthma

In 2006, 32,957 children (21.0%) aged under 21 who were continuously enrolled in HUSKY A received care or filled at least one prescription for asthma medication (Table 2), a rate similar to the 2005 rates (33,217 children, or 19.6%, had asthma care or a prescription for asthma medication).[15] As in previous years, asthma prevalence in 2006 varied with age, gender, race/ethnicity, primary language, residence, and health plan:

- **Age:** Children under 6 were more likely to have asthma care or medication than children 6 and older.[16]
- **Gender:** Boys were more likely than girls to have asthma care or medication.[17]
- **Race/ethnicity:** Hispanic children were more likely to have care or medication for asthma compared with African-American children, White children, and children of other racial/ethnic groups.[18]
- **Residence:** Hartford children were somewhat more likely to have asthma care or medication compared with those living in all other towns.[19]
- **Primary Language:** Children from Spanish-speaking households were more likely to have asthma care or medication compared with children from English-speaking households and households with other primary languages.[20]

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[14] Pearce N, Beasley R, Burgess C, Crane J. Asthma epidemiology: principles and methods. New York: Oxford University Press; 1998.

[15] Had the prevalence estimate been based on visits for primary or secondary diagnoses of asthma, without respect to whether the child received a prescription for asthma medication, the prevalence estimate would have been 10.7%, slightly lower than estimates for 2005 (8.9%), 2004 (9.4%) or 2003 (9.2%) using the same method. Had the prevalence estimate been based on any primary diagnosis or at least 4 filled asthma prescriptions, as adopted for monitoring in Michigan's Medicaid program, the rate would have been 11.9%.

[16] $RR_{\text{Age <1: all others}} = 1.12$ (95% CI: 1.02, 1.22); $RR_{\text{Age 1 to 5: all others}} = 1.24$ (95% CI: 1.21, 1.26); $RR_{\text{Age 6 to 14: all others}} = 0.97$ (95% CI: 0.95, 0.99); $RR_{\text{Age 15 to 20: all others}} = 0.77$ (95% CI: 0.75, 0.79).

[17] $RR_{\text{boys: girls}} = 1.19$ (95% CI: 1.17, 1.22).

[18] $RR_{\text{African American: all others}} = 0.95$ (95% CI: 0.93, 0.97); $RR_{\text{White: all others}} = 0.92$ (95% CI: 0.90, 0.94); $RR_{\text{Hispanic: all others}} = 1.16$ (95% CI: 1.14, 1.19); $RR_{\text{Other racial/ethnic groups: White, African American, Hispanic}} = 0.76$ (95% CI: 0.70, 0.82).

[19] $RR_{\text{Bridgeport : all other cities and towns}} = 1.02$ (95% CI: 0.99, 1.06) ; $RR_{\text{Hartford : all other cities and towns}} = 1.07$ (95% CI: 1.04, 1.10) ; $RR_{\text{New Haven : all other cities and towns}} = 0.82$ (95% CI: 0.80, 0.86) ; $RR_{\text{Bridgeport, Hartford, New Haven: other towns}} = 1.03$ (95% CI: 1.00, 1.05).

- **Health Plan:** Rates for children in the four health plans were very similar.[21]

There were 7,843 children with persistent asthma using the modified definition of the NCQA definition of persistent asthma, corresponding to a prevalence estimate of 5.0 percent in 2006 (23.8% of all children who received any care or any prescription for asthma). The overall prevalence estimate for 2005 was higher (7.0%), as were the estimated number of children with persistent asthma (11,787), and proportion of children with persistent asthma among all children with asthma (35.5%).

Asthma-related Health Care Utilization

In 2006, children who had any asthma care (14,615 children or 44 percent of children who met our definition of asthma) made an average of three office visits for asthma care (range: 1 to 42) (Table 3). Just 18 percent of children with any visits made more than one visit, as recommended by national guidelines for care.[22]

Among children with asthma, 3,208 children (9.7%) made 4,257 visits for emergency care (average 1.3 per child with any emergency care), virtually unchanged from 2005 (9.8% with an average of 1.4 per child with any emergency care). One in five children (656 children or 20.4% of children with any emergency care) was seen in the emergency department more than once, a slight decrease over 2005 where one in four children had more than one emergency care visit. The emergency care utilization rate among asthmatic children who changed health plans was higher than the rate for children who stayed in the same health plan (12.0% and 9.6%, respectively).

In 2006, 553 asthmatic children (1.7% of all those with asthma) were hospitalized at least once for asthma; 96 were hospitalized more than once. Hospitalizations for asthma mirror those in 2005, where 510 children (1.5% of those with asthma) were hospitalized at least once for asthma and 65 children were hospitalized more than once. The hospitalization rate among asthmatic children who changed health plans was no different than the rate for children who stayed in the same health plan (2.1% and 1.7%, respectively).

As expected, office and clinic visits for asthma showed a seasonal pattern (Figure 1), as did emergency visits (Figure 2). An increase in the visit rate for both office visits and emergency visits occurred in mid- to late-September. Visits peaked in the fourth quarter when 32 percent of office visits and 33 percent of emergency visits occurred.

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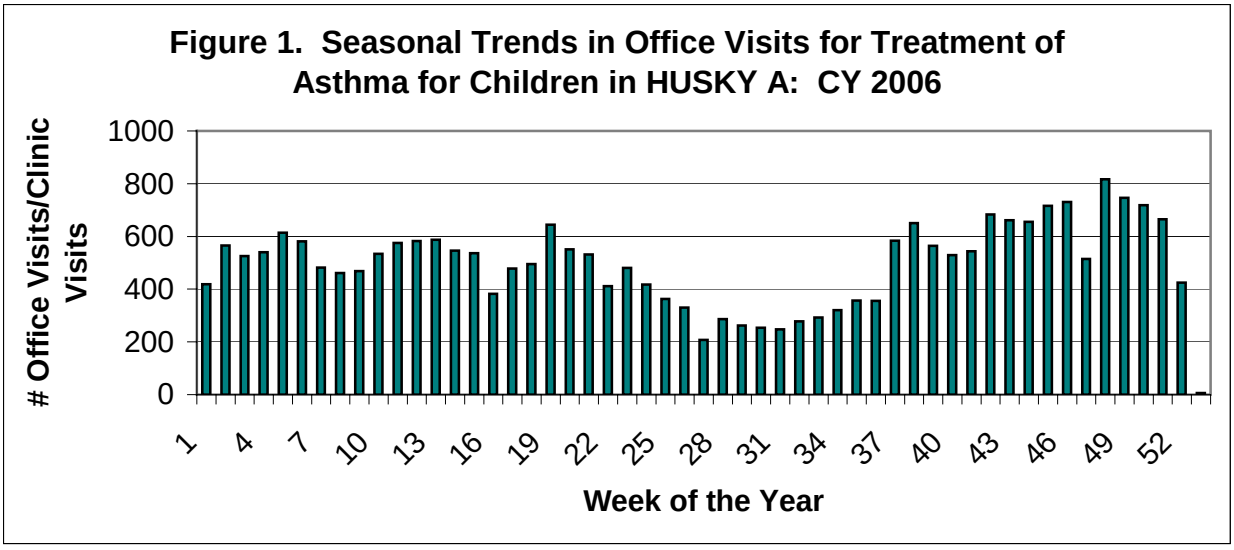
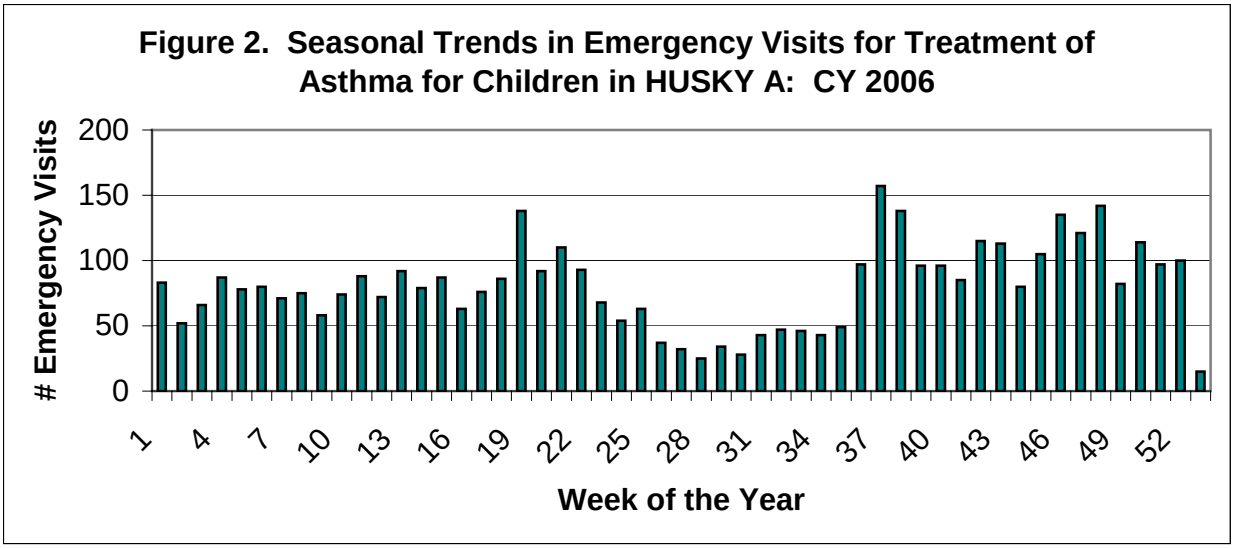
[20] $RR_{\text{English: all others}} = 0.89$ (95% CI: 0.86, 0.92); $RR_{\text{Spanish: all others}} = 1.13$ (95% CI: 1.10, 1.17); $RR_{\text{Other language groups: English, Spanish}} = 0.99$ (95% CI: 0.88, 1.12).

[21] $RR_{\text{BlueCare: all others}} = 1.07$ (95% CI: 1.05, 1.09); $RR_{\text{CHNCT: all others}} = 0.98$ (95% CI: 0.95, 1.00); $RR_{\text{HealthNet: all others}} = 0.95$ (95% CI: 0.93, 0.97); $RR_{\text{Preferred One: all others}} = 0.92$ (95% CI: 0.89, 0.95); $RR_{\text{Changers: all others}} = 1.08$ (95% CI: 1.04, 1.12).

[22] National Heart, Lung, and Blood Institute. Guidelines for diagnosis and management of asthma. Bethesda, MD: NHLBI, 2007; p. 67. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/.





Two in five (40.1% of) children with asthma had both a visit for treatment or management of asthma *and* a prescription (Table 4), unchanged from 2005 (40.8%). Over half of children with asthma (55.7%) had only prescriptions without any other visits, similar to 2005 (54.4%).

Over half (55.7%) of children who met our definition of asthma had one or more prescriptions for asthma medication but no evidence of any office-based or acute care for asthma (i.e., no primary diagnosis for asthma). The most frequent diagnoses for other office and clinic visits that these children had included diagnoses of upper respiratory or ear, nose and throat conditions.[23] These findings may be explained in several ways: First, some of these children may not have had asthma but were being treated for other conditions such as exercise-induced bronchoconstriction or allergic

[23] In descending order of numbers of visits in 2006: otitis media; acute upper respiratory infection; symptoms involving the respiratory system (including wheezing); acute pharyngitis, bronchitis or bronchiolitis; viral infection (including rhinovirus); allergic rhinitis; acute sinusitis; contact dermatitis; streptococcal sore throat; and disorders of the conjunctiva.

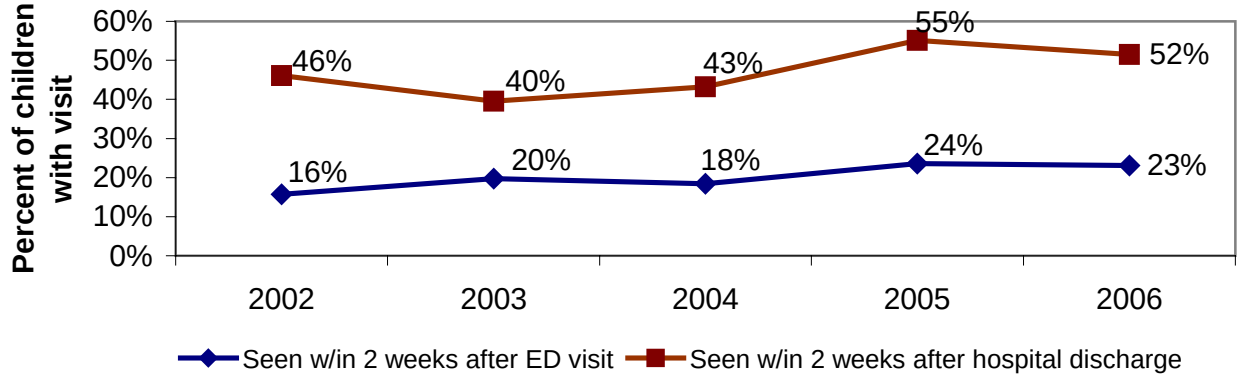
rhinitis.[24] Some of these children may have received prescriptions for asthma medications during well-child visits (for which a secondary, uncounted diagnosis may have been asthma) or during other acute care visits for upper respiratory conditions. Some may have had other third party coverage for the visit but relied on HUSKY coverage for medications.

Follow-up after emergency care and hospitalization

Among the 3,208 asthmatic children who received any emergency care, fewer than one in four (23.1%) children received follow-up care with an asthma-related diagnosis within 2 weeks of the visit as recommended (Table 5)—unchanged from 2005 (23.6%). The proportion of children who received follow-up for an asthma-related diagnosis within one month of the ED visit was higher than the two-week follow-up rate but is not substantially improved (27.4%). Managed care plan-specific follow-up rates at two weeks varied somewhat (range: 17.7% - 26.1%) at 2 weeks and even more by one month following the emergency visit (21.5% - 31.3%).

Just one of every two children who was hospitalized for treatment of asthma (51.5%) was seen in the 2 weeks following discharge; managed care plan-specific rates varied widely (range: 46.5% for BlueCare - 64.1% for CHNCT). These rates for follow-up are very low, give NHLBI guidelines, and have declined among children who were hospitalized over the previous years for which comparable data are available (Figure 3).

Figure 3. HUSKY A Children With Follow-Up After Emergency Care or Hospitalization for Treatment of Asthma: 2003-2006



Preferred Medications

Among the 7,843 children with persistent asthma, 6,500 (82.9%) filled prescriptions for preferred therapies for long-term control of symptoms. The rates varied only slightly by managed care plan (Table 6). Rates for filled prescriptions were lowest among the youngest and oldest children (73.5%

[24] For example, Singulair is a leukotrine modifier that is indicated for prophylaxis and chronic treatment of asthma and for treatment of other conditions, such as allergic rhinitis or exercise-induced bronchoconstriction.

for children under 5, 87.8% for children 5 to 9, 86.5% for children 10 to 17, and 67.6% for children 18 to 20).

COMPARISON WITH OTHER DATA

Asthma Prevalence

Prevalence estimates from other states are shown in Table 7 and compared with the estimate for children in HUSKY A. Different sampling methods and case definitions undoubtedly contributed to the rate differences, with the estimate for children in HUSKY A considerably higher than the rates reported for other states. Were we to have counted only those children with a primary diagnosis or four or more prescriptions (11.9%), our results would have been higher than rates reported for New Hampshire (7.0 – 8.2%, depending on child's age) and comparable to rates reported for New York (8.2% - 15.5%, depending on child's age and coverage type).

Data from the 2006 National Health Interview Survey show that an estimated 9.4 percent of children in the United States have asthma; asthma rates are highest among Black children and those insured by Medicaid.[25] Connecticut-specific asthma prevalence data from the 2003 National Survey on Children's Health show that parents reported a lower overall percentage of all children affected by asthma in the 12 months prior to the survey (8.1% of children 0-17), but a higher percentage of affected children among those whose parents reported that they were publicly insured (16.0%).[26]

Asthma Management

The percentages of children in HUSKY A in 2006 who received appropriate medications for management of persistent asthma were consistent with age-specific rates reported by NCQA for Medicaid managed care plans nationwide (for children 5 to 9: 87.8% in HUSKY A, compared with 89.6% nationwide; for children 10 to 17: 86.5% in HUSKY A, compared with 87.0% nationally).[27]

DISCUSSION

The asthma prevalence estimate (21.0%) in this report is high, relative to recent data from other states. This difference is probably due to having included in that count those children with any prescription medications versus four or more. However, the estimated prevalence of persistent asthma is consistent with results from other states, despite our modification of the NCQA methodology. The study methods should be revisited and refined for next year's reporting.

Even so, it is evident that there is room for improvement in the quality of care that children with asthma receive:

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[25] See Table IV in: Bloom B, Cohen RA. Summary Health Statistics for U.S. Children: National Health Interview Survey, 2006. National Center for Health Statistics. Vital Health Stat 10(234). 2007.

[26] U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. The National Survey of Children's Health 2003. Rockville, Maryland: U.S. Department of Health and Human Services, 2005. Available from: http://www.nschdata.org.

[27] National Committee for Quality Assurance. The state of health care quality 2007. HEDIS measures of care. Washington, DC: NCQA, 2007. Available at: http://www.ncqa.org/Portals/0/Publications/Resource%20Library/SOHC/SOHC_07.pdf. NCQA reporting methods were modified for this report, as described in earlier.

- **Follow-up after emergency care or hospitalization:** Relatively few children receive a follow-up visit for evaluation of the symptoms that prompted an emergency visit (23.1% within 2 weeks, 27.4% within 4 weeks). The two-week follow-up after discharge from inpatient treatment of asthma (51.5%) is also troublingly low. Neither rate has improved remarkably since monitoring began five years ago.

- **Use of long-term control medication:** While the percentages of children who received appropriate medications for asthma management compare favorably to those reported by NCQA for other Medicaid managed care organizations nationwide, the rates for children 5 to 9 and 10 to 17 also show that ten percent or more of children with asthma could be better managed.

CONCLUSIONS

- **One in five children in HUSKY A received health care for asthma or prescriptions used for treatment of asthma in 2006.** The burden of disease is disproportionately high among younger children, boys, Hispanic children, and children residing in Spanish-speaking households.

- **Relatively few children receive timely office or clinic visits following an emergency visit or hospital discharge.** Follow-up rates have not improved in recent years and have fallen farther below treatment guidelines.

- **Most but not all children with persistent asthma received appropriate medications for long-term control of symptoms.**

- **Methods for estimating asthma prevalence should be revised to produce data comparable to reporting from other states.**

Table 1. Sociodemographic Characteristics of HUSKY A Enrollees by Health Plan, CY 2006

	All Enrollees[a]		BlueCare		CHNCT		HealthNet		Preferred One		Changed Plans[b]	
	#	%	#	%	#	%	#	%	#	%	#	%
Total	157,178	100.0%	63,938	40.7%	27,070	17.2%	41,463	26.4%	15,444	9.8%	9,263	5.9%
Age:												
<1	1,575	1.0%	634	1.0%	280	1.0%	361	0.9%	165	1.1%	135	1.5%
1-5	46,359	29.5%	18,928	29.6%	8,309	30.7%	11,392	27.5%	4,760	30.8%	2,970	32.1%
6-14	76,219	48.5%	31,119	48.7%	12,719	47.0%	20,536	49.5%	7,534	48.8%	4,311	46.5%
15-20	33,025	21.0%	13,257	20.7%	5,762	21.3%	9,174	22.1%	2,985	19.3%	1,847	19.9%
Gender:												
Female	71,381	45.4%	28,854	45.1%	12,423	45.9%	18,848	45.5%	7,046	45.6%	4,210	45.4%
Male	71,507	45.5%	29,114	45.5%	12,148	44.9%	19,183	46.3%	6,909	44.7%	4,153	44.8%
Unknown	14,290	9.1%	5,970	9.3%	2,499	9.2%	3,432	8.3%	1,489	9.6%	900	9.7%
Race/ethnicity:												
Black	35,984	22.9%	13,202	20.6%	5,922	21.9%	8,370	20.2%	5,816	37.7%	2,674	28.9%
White	51,739	32.9%	22,968	35.9%	5,157	19.1%	18,877	45.5%	2,549	16.5%	2,188	23.6%
Hispanic	51,508	32.8%	20,161	31.5%	12,906	47.7%	9,677	23.3%	5,403	35.0%	3,361	36.3%
Other groups	3,657	3.5%	1,637	4.0%	586	2.7%	1,107	4.9%	187	1.5%	140	2.0%
Unknown	14,290	13.6%	5,970	14.6%	2,499	11.4%	3,432	15.2%	1,489	11.5%	900	12.7%
Primary Language:												
English	134,752	85.7%	54,367	85.0%	22,088	81.6%	37,031	89.3%	13,495	87.4%	7,771	83.9%
Spanish	13,189	8.4%	5,484	8.6%	3,708	13.7%	1,758	4.2%	1,375	8.9%	864	9.3%
Other	979	0.6%	404	0.6%	175	0.6%	245	0.6%	106	0.7%	49	0.5%
Unknown	8,258	5.3%	3,683	5.8%	1,099	4.1%	2,429	5.9%	468	3.0%	579	6.3%
Residence:												
Bridgeport	15,087	9.6%	1,751	2.7%	2,734	10.1%	6,268	15.1%	3,209	20.8%	1,125	12.1%
Hartford	17,928	11.4%	11,651	18.2%	2,170	8.0%	1,432	3.5%	1,677	10.9%	998	10.8%
New Haven	14,906	9.5%	3,004	4.7%	5,731	21.2%	1,190	2.9%	3,555	23.0%	1,426	15.4%
All other towns	109,257	69.5%	47,532	74.3%	16,435	60.7%	32,573	78.6%	7,003	45.3%	5,714	61.7%

Source: HUSKY A enrollment data from the Connecticut Department of Social Services.

[a] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

[b] Children who changed plans at least once in CY 2006.

Table 2. Prevalence of Asthma[a] Among Children Continuously Enrolled in HUSKY A by Health Plan, CY 2006

	All Enrollees[b]		BlueCare		CHNCT		HealthNet		Preferred One		Changed Plans[c]	
	#	%	#	%	#	%	#	%	#	%	#	%
Total	32,957	21.0%	13,914	21.8%	5,566	20.6%	8,393	20.2%	2,993	19.4%	2,091	22.6%
Age:												
<1	369	23.4%	166	26.2%	70	25.0%	70	19.4%	39	23.6%	24	17.8%
1-5	11,248	24.3%	4,775	25.2%	1,938	23.3%	2,711	23.8%	1,062	22.3%	762	25.7%
6-14	15,747	20.7%	6,689	21.5%	2,611	20.5%	4,079	19.9%	1,444	19.2%	924	21.4%
15-20	5,593	16.9%	2,284	17.2%	947	16.4%	1,533	16.7%	448	15.0%	381	20.6%
Gender:												
Female	13,402	18.8%	5,609	19.4%	2,275	18.3%	3,466	18.4%	1,193	16.9%	859	20.4%
Male	16,029	22.4%	6,720	23.1%	2,695	22.2%	4,133	21.5%	1,471	21.3%	1,010	24.3%
Unknown	3,526	24.7%	1,585	26.5%	596	23.8%	794	23.1%	329	22.1%	222	24.7%
Race/ethnicity:												
Black	7,118	19.8%	2,831	21.4%	1,058	17.9%	1,678	20.0%	1,002	17.2%	549	20.5%
White	10,080	19.5%	4,561	19.9%	950	18.4%	3,617	19.2%	455	17.9%	497	22.7%
Hispanic	11,658	22.6%	4,649	23.1%	2,883	22.3%	2,144	22.2%	1,179	21.8%	803	23.9%
Other groups	575	15.7%	288	17.6%	79	13.5%	160	14.5%	28	15.0%	20	14.3%
Unknown	3,526	24.7%	1,585	26.5%	596	23.8%	794	23.1%	329	22.1%	222	24.7%
Primary Language:												
English	27,891	20.7%	11,686	21.5%	4,408	20.0%	7,515	20.3%	2,560	19.0%	1,722	22.2%
Spanish	3,095	23.5%	1,307	23.8%	880	23.7%	376	21.4%	326	23.7%	206	23.8%
Other	203	20.7%	92	22.8%	27	15.4%	57	23.3%	18	17.0%	9	18.4%
Unknown	1,768	21.4%	829	22.5%	251	22.8%	445	18.3%	89	19.0%	154	26.6%
Residence:												
Bridgeport	3,231	21.4%	324	18.5%	567	20.7%	1,362	21.7%	709	22.1%	269	23.9%
Hartford	3,977	22.2%	2,634	22.6%	451	20.8%	284	19.8%	371	22.1%	237	23.7%
New Haven	2,622	17.6%	583	19.4%	1,010	17.6%	181	15.2%	584	16.4%	264	18.5%
All other towns	23,127	21.2%	10,373	21.8%	3,538	21.5%	6,566	20.2%	1,329	19.0%	1,321	23.1%

Source: HUSKY A enrollment data from the Connecticut Department of Social Services.

[a] Children in HUSKY A with at least one encounter record with primary diagnosis of asthma (ICD-9-CM code 493.0 - 493.9) or at least one prescription for asthma medication (long-term control medication or quick-relief medications) in CY 2006.

[b] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

[c] Children who changed plans at least once in CY 2006.

Table 3. Asthma Health Care Utilization in HUSKY A, CY 2006

	All Enrollees	Same Plan	Changed Plans[c]
Number of children enrolled in HUSKY A[a]	157,178	147,915	9,263
Number of children with asthma[b]	32,957	30,866	2,091
Prevalence of asthma	21.0%	20.9%	22.6%
Number of children with prescription for asthma only	18,342	17,203	1,139
Percent of children with prescription only	55.7%	55.7%	54.5%
Number of children with care for asthma:	14,615	13,663	952
Total office or clinic visits made for asthma	43,416	40,579	2,837
Average number of office or clinic visits	2.98	2.97	2.98
Range	1 to 42	1 to 42	1 to 13
Number with more than one asthma visit[d]	5,769	5,410	359
Percent of children with asthma	17.50%	17.53%	17.17%
Number with any emergency care	3,208	2,957	251
Percent enrollees	2.0%	2.0%	2.7%
Percent of children with asthma	9.7%	9.6%	12.0%
Number hospitalized at least once	553	510	43
Percent of enrollees	0.4%	0.3%	0.5%
Percent of children with asthma	1.7%	1.7%	2.1%

Source: HUSKY A encounter data from the Connecticut Department of Social Services.

[a] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

[b] Children in HUSKY A with at least one encounter record with primary diagnosis of asthma (ICD-9-CM code 493.0 - 493.9) or at least one prescription for asthma medication (long-term control medication or quick-relief medications) in CY 2006.

[c] Children who changed plans at least once in CY 2006.

[d] Office and clinic visits only; does not include emergency care or hospitalizations.

Table 4. Children with Asthma[a] in HUSKY A: Visits and Prescription Medications, CY 2006

	Had medication for asthma treatment?	
Had asthma care?	**YES**	**NO**
YES	13,232	1,383
Percent children with asthma	40.1%	4.2%
NO	18,342	did not have asthma care
Percent children with asthma	55.7%	or prescription

Source: HUSKY A encounter data from the Connecticut Department of Social Services.

[a] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

Children in HUSKY A with at least one encounter record with primary diagnosis of asthma (ICD-9-CM code 493.0 - 493.9) or at least one prescription for asthma medication (long-term control medication or quick-relief medications) in CY 2006.

Table 5. Follow-up After Emergency Visit or Hospitalization for Asthma, CY 2006[a]

	All Enrollees[b]		BlueCare		CHNCT		HealthNet		Preferred One		Changed Plans[c]	
	#	%	#	%	#	%	#	%	#	%	#	%
Asthmatic children with any emergency care	3208	100.0%	1301	100.0%	637	100.0%	652	100.0%	367	100.0%	251	100.0%
Seen within 2 weeks of first ER visit with asthma related diagnosis	742	23.1%	306	23.5%	150	23.5%	170	26.1%	65	17.7%	51	20.3%
Seen within 1 month of first ER visit with asthma related diagnosis	879	27.4%	352	27.1%	181	28.4%	204	31.3%	79	21.5%	63	25.1%
Seen within 2 weeks of first ER visit with any diagnosis	1308	40.8%	533	41.0%	259	40.7%	311	47.7%	112	30.5%	93	37.1%
Seen within 1 month of first ER visit with any diagnosis	1622	50.6%	660	50.7%	329	51.6%	370	56.7%	144	39.2%	119	47.4%
Asthmatic children with any hospitalization	553	100.0%	225	100.0%	117	100.0%	107	100.0%	61	100.0%	43	100.0%
Seen within 7 days of first hospitalization with asthma related diagnosis	232	42.0%	86	38.2%	60	51.3%	48	44.9%	23	37.7%	15	34.9%
Seen within 2 weeks of first hospitalization with asthma related diagnosis	285	51.5%	105	46.7%	75	64.1%	56	52.3%	29	47.5%	20	46.5%
Seen within 1 month of first hospitalization with asthma related diagnosis	313	56.6%	112	49.8%	79	67.5%	62	57.9%	35	57.4%	25	58.1%
Seen within 7 days of first hospitalization with any diagnosis	305	55.2%	118	52.4%	69	59.0%	69	64.5%	27	44.3%	22	51.2%
Seen within 2 weeks of first hospitalization with any diagnosis	371	67.1%	140	62.2%	85	72.6%	79	73.8%	37	60.7%	30	69.8%
Seen within 1 month of first hospitalization with any diagnosis	409	74.0%	157	69.8%	90	76.9%	84	78.5%	42	68.9%	36	83.7%

Source: HUSKY A encounter data from the Connecticut Department of Social Services.

[a] Children in HUSKY A with at least one encounter record with primary diagnosis of asthma (ICD-9-CM code 493.0 - 493.9) or at least one prescription for asthma medication (long-term control medication or quick-relief medications) in CY 2006.

[b] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

[c] Children who changed plans at least once in CY 2006.

Table 6. Use of Appropriate Medications for Persistent Asthma by Age and Managed Care Plan, CY 2006[a]

	Total		BlueCare		CHNCT		HealthNet		Preferred One		Changed Plans[c]	
	#	%	#	%	#	%	#	%	#	%	#	%
Connecticut[b]	7,843	82.9%	2,769	83.9%	1,161	81.0%	1,591	85.6%	592	78.2%	387	78.7%
5 to 9	2,296	87.8%	990	89.0%	397	86.7%	561	88.8%	205	85.1%	143	82.7%
10 to 17	2,532	86.5%	1,036	86.0%	472	86.3%	663	88.6%	234	85.1%	127	82.5%
United States		NA										
5 to 9		89.6%										
10 to 17		87.0%										

Source: HUSKY A encounter data from the Connecticut Department of Social Services.

[a] Children in HUSKY A with persistent asthma who received treatment with long-term control medications (i.e., preferred therapies) according to a HEDIS measure developed by NCQA and modified for this study, in CY 2006.

[b] Children aged under 21 years and continuously enrolled in HUSKY A in CY 2006.

[c] Children who changed plans at least once in CY 2006.

Table 7. Asthma Prevalence Estimates for Children in Medicaid: Comparison of state data

	Connecticut	New Hampshire	New York		Minnesota	
Year	2006	2004	2005		2003-2005	
Age group	birth - 21	birth - 17	birth-17		birth - 17	
Enrollment criteria	continuously enrolled 1 yr	continuously enrolled 11 months	continuously enrolled 1 yr		continuously enrolled 11 months	
Type of program[a]	MMC	All Medicaid	MMC	FFS	MMC	FFS
Number of children	157,178	43,606	801,943	207,426	99,411	28,460
Had asthma diagnosis or med[b]	**1^{o} dx or rx**	**1^{o} dx or 4^{+} rx**	**1^{o} or 2^{o} dx or 4^{+} rx**		**NR**	
Percent with asthma	21.0%	0 - 4 8.2% 5 - 9 7.9% 10-17 7.0%	0 - 4 12.5% 5 - 9 12.1% 10-17 8.2%	0 - 4 15.5% 5 - 9 13.7% 10-17 10.1%		
Had persistent asthma[c]	At least 1 ED visit *OR* at least 1 inpatient stay *OR* 4^{+} outpatient visits plus 2^{+} prescriptions *OR* 4^{+} prescriptions					
	0 - 4 5.1% 5 - 9 5.9% 10-17 4.5% 18 - 20 3.4%	0 - 4 4.9% 5 - 9 5.4% 10-17 5.0%	0 - 4 2.8%[c] 5 - 9 3.8% 10-17 2.3%	0 - 4 2.4%[c] 5 - 9 2.6% 10-17 1.8%	0 - 4 3.4% 5 - 9 3.6% 10-17 2.7%	0 - 4 6.3% 5 - 9 5.6% 10-17 4.5%

[a] MMC: Medicaid managed care program; FFS: Medicaid fee-for-services program; NR: not reported

[b] Had encounter record for care with primary or secondary diagnosis of asthma (1^{o} or 2^{o} dx) or prescription (rx) for asthma medications

[c] NY State counted records for at least 1 ED visit OR at least 1 hospital admission OR 4 outpatient visits OR 4 prescriptions

Connecticut data: Connecticut Voices for Children. Asthma and asthma-related health care for children enrolled in HUSKY A: 2006. www.ctkidslink.org

New Hampshire data: New Hampshire Department of Health and Human Services. Asthma in New Hampshire, 1990-2004. June 2006.

New York data: New York State Department of Health. New York State asthma surveillance summary report: October 2007.

Minnesota data: Minnesota Department of Health. Asthma Among Minnesota Health Care Program Enrollees. May 2007.