

HSC Statistical Brief No. 20

Asthma Surveillance in the West Virginia CHIP Population – Year 2005

The West Virginia Children’s Health Insurance Program (CHIP) provides coverage to uninsured children who are not eligible to receive coverage through the Medicaid program. These children are in families whose incomes are too high to qualify for Medicaid, but are less than twice that of the current Federal Poverty Level (1). CHIP enrollees are of particular interest to public health programs because many health conditions, including asthma, are inversely associated with socioeconomic indicators such as income. That is, individuals with low levels of income are more likely to have chronic health conditions. In fact, in 2003 the prevalence of asthma was nearly two times higher among West Virginia children with health care coverage through CHIP or Medicaid than children with private health insurance (15.0% vs. 8.0%) (2).

West Virginia public health programs are working to reduce socioeconomic disparities related to chronic disease and access to health care. The first step is to identify and understand the burden of disease among West Virginians of low socioeconomic status. Therefore, the West Virginia Asthma Education and Prevention Program funded a project headed by Michael Smith, Ph.D., R.Ph., at the West Virginia University School of Pharmacy to analyze West Virginia CHIP claims data from calendar year 2005 to determine: 1) the prevalence of asthma in the CHIP population, 2) asthma-related medical services and prescription utilization among CHIP enrollees, and 3) the amount reimbursed for asthma-related services and prescriptions by West Virginia CHIP. It is important to note that the methodology used in this report may overestimate the prevalence of asthma and asthma-related medical service visits and reimbursements. See the Appendix for a discussion of the study methodology and for detailed data tables.

Table 1
Summary of Utilization of Asthma-related Health Care by West Virginia CHIP Enrollees, 2005

TOTAL ASTHMA UTILIZATION ^a				
Type of utilization	Number of enrollees with asthma	Prevalence rate per 1,000 enrollees	Total amount reimbursed ^{d,e}	Avg. reimbursed per enrollee ^e
Total asthma utilization	4,086	168	\$1,845,669 - \$1,942,183	\$452 - \$475
MEDICAL VISIT UTILIZATION ^b				
Type of utilization	Number of visits	Rate of visits per 10,000 enrollees	Total amount reimbursed	Avg. reimbursed per visit
Office/Clinic visits	5,725	2,350	\$543,404	\$95
Emergency Room visits	455	187	\$121,671	\$267
Hospitalizations	65	27	\$86,529 - \$183,043	\$1,331 - \$2,816
PRESCRIPTION UTILIZATION ^c				
Type of utilization	Number of claims for asthma-related drugs	Average number of claims per enrollee	Total amount reimbursed	Avg. reimbursed per enrollee
Prescriptions	11,089	5.0	\$754,343	\$340

a. Based on enrollees identified with asthma by the presence of at least one claim for a medical service with a primary or secondary diagnosis of asthma OR at least two prescription claims for asthma-related medications, at least one of which was for a drug other than an oral steroid.

b. Based on services with a primary or secondary diagnosis of asthma.

c. Based on enrollees with a medical service claim with a primary or secondary diagnosis of asthma and at least one prescription claim for an asthma-related drug.

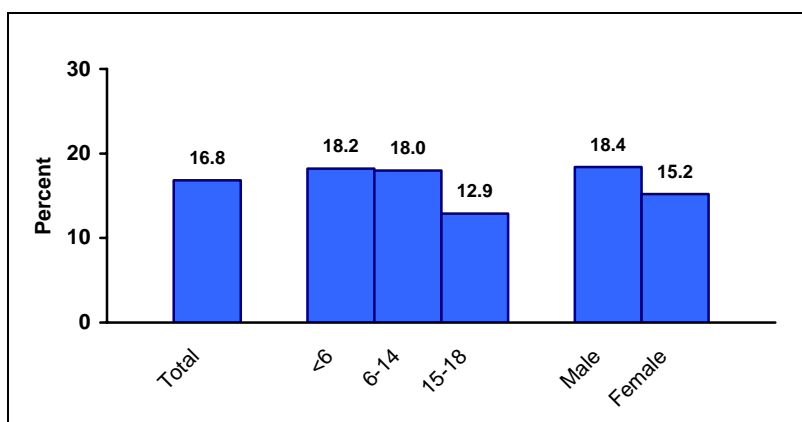
d. The amounts reimbursed for medical visit claims and prescription utilization claims do not sum to the total amount reimbursed for all asthma-related claims. The prescription utilization results presented are only for those enrollees who had a medical visit with a primary or secondary diagnosis of asthma. Enrollees who were identified with asthma based only on prescription utilization are not represented in the “Prescription Utilization” results in this table but are represented in the “Total Asthma Utilization” results.

e. The range of dollars reimbursed reflects the two different methods used to calculate hospitalization costs (see Methodology in Appendix for a detailed discussion).

ASTHMA PREVALENCE & TOTAL REIMBURSEMENTS

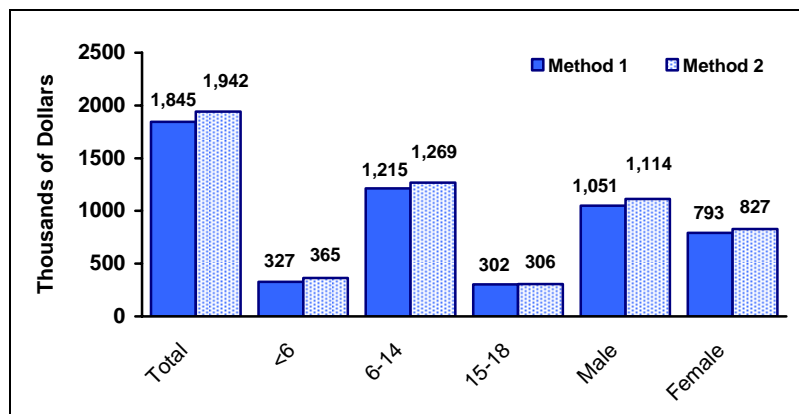
In 2005, approximately 17% of West Virginia CHIP enrollees had asthma. This equals more than 4,000 of the approximately 24,000 CHIP enrollees. Enrollees were identified as having asthma if they had at least one medical service claim (office/clinic, emergency room, or hospital) with a primary or secondary diagnosis of asthma (ICD-9 CM codes 493.00-493.99), or at least two prescription claims for asthma-related drugs, of which at least one was for a drug other than an oral steroid¹. The prevalence of asthma was highest among infants and children 5 years of age and younger, children between 6 and 14 years of age, and males (see Figure 1). In 2005, West Virginia CHIP reimbursed more than \$1.8 million for asthma-related medical service and prescription claims (see Figure 2). This is an average of approximately \$450 to \$475 per enrollee with asthma.

Figure 1
The Prevalence of Asthma among
West Virginia CHIP Enrollees by Age and Gender, 2005



See Appendix for the methodology used to identify enrollees with asthma.
See Appendix Table A1 for more detail.

Figure 2
Total West Virginia CHIP Asthma-Related
Reimbursements by Age and Gender of Enrollees, 2005



Note: Two estimates of total reimbursements for asthma are presented based on the two different methods used to calculate hospitalization costs. See Methodology in Appendix for a detailed discussion of these methods and Table A1 for more detailed data.

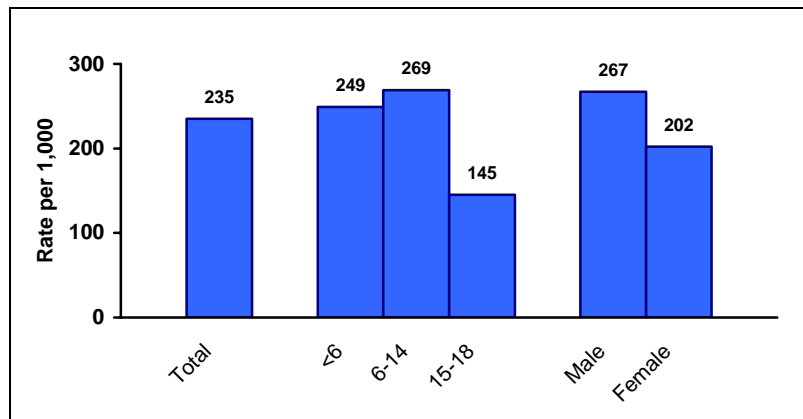
¹ The definition used to identify enrollees with asthma is based on modified criteria of the National Committee for Quality Assurance (NCQA). Oral steroids are used to treat many conditions other than asthma. Therefore, if an enrollee had a claim for an oral steroid, he/she must also have had an asthma-related prescription claim for a medication in another pharmacotherapy class to be classified as having asthma. See Appendix for a more detailed discussion of the study methodology.

MEDICAL SERVICES USE & COSTS

Asthma-related medical services were defined as office/clinic visits, emergency room (ER) visits, and hospitalizations with a primary or secondary diagnosis of asthma². In 2005, there were 5,725 office/clinic visits, 455 ER visits, and 65 hospitalizations for asthma-related illnesses among West Virginia CHIP enrollees. Male enrollees had higher rates of all types of medical services visits than females (see Figure 3, Figure 4, and Figure 5). Children under the age of six had a substantially higher rate of asthma-related hospitalizations than the older enrollees. Enrollees 15 to 18 years old had a much lower rate of office/clinic visits than the younger enrollees.

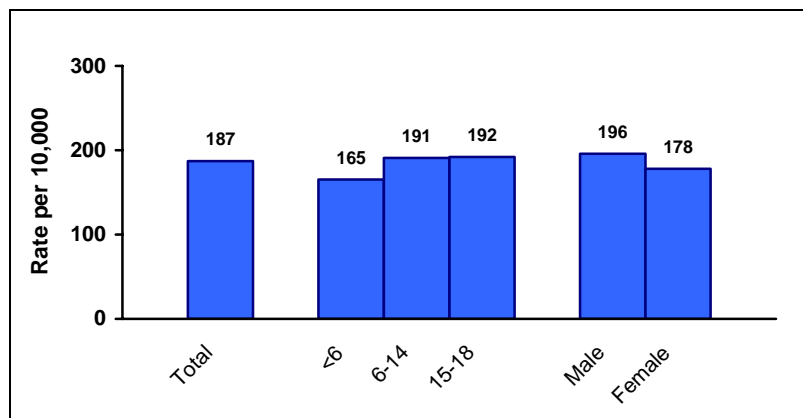
West Virginia CHIP reimbursements for asthma-related medical services totaled between approximately \$750,000 and \$850,000. ER visits and hospitalizations accounted for approximately one-third (28% to 36%) of this total. CHIP reimbursed an average of \$95 per office/clinic visit, \$267 per ER visit, and between \$1,331 and \$2,816 per hospitalization (see Table 2).

Figure 3
Rates of Asthma-Related Office/Clinic Visits among West Virginia CHIP Enrollees by Age and Gender, 2005



Note: Based on claims with a primary or secondary diagnosis of asthma. See Appendix Table A2 for more detail.

Figure 4
Rates of Asthma-Related Emergency Room Visits among West Virginia CHIP Enrollees by Age and Gender, 2005

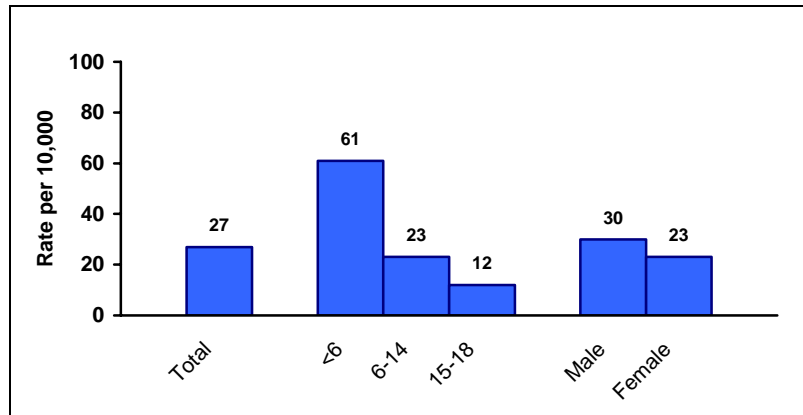


Note: Based on claims with a primary or secondary diagnosis of asthma. See Appendix Table A3 for more detail.

² If an enrollee had an ER and hospital claim on the same date of service, then it was assumed that the enrollee visited the ER and then was subsequently admitted to the hospital. In this circumstance, the event was classified only as a hospitalization to avoid double counting. See Appendix for a more detailed discussion of the study methodology.

MEDICAL SERVICES USE & COSTS

Figure 5
Rates of Asthma-Related Hospitalizations among
West Virginia CHIP Enrollees by Age and Gender, 2005



Note: Based on claims with a primary or secondary diagnosis of asthma.
 See Appendix Table A4 for more detail.

Table 2
West Virginia CHIP Reimbursements for Asthma-Related Medical Services Visits, 2005

Medical Services	Number of Visits	Total Amount Reimbursed ^a	Average Amount Reimbursed per Visit ^a
Office/Clinic Visits	5,725	\$543,404	\$95
Emergency Room Visits	455	\$121,671	\$267
Hospitalizations	65	\$86,529 - \$183,043	\$1,331 - \$2,816
TOTAL	6,245	\$751,604 - \$848,118	----

a. The range of dollars reimbursed reflects the two different methods used to calculate hospitalization costs. See Methodology in Appendix for a detailed discussion of these methods.
 Note: Based on claims with a primary or secondary diagnosis of asthma.
 See Appendix Table A2, Table A3, and Table A4 for more detail.

PRESCRIPTION MEDICATION USE & COSTS

In 2005, there were 2,218 West Virginia CHIP enrollees who had a medical service claim with a primary or secondary diagnosis of asthma who also had at least one prescription claim for an asthma-related medication. These enrollees had a total of 11,089 prescription claims for asthma-related medications – an average of 5 claims per enrollee with asthma (defined as having had an asthma-related medical service claim and an asthma-related prescription claim).

There are two main types of asthma medications: 1) quick-relief medications, which are used to relieve symptoms during an asthma attack, and 2) long-term controller medications, which are used to prevent attacks from occurring. Most enrollees with asthma who had filled a prescription for an asthma-related medication had received some type of quick-relief medication (see Figure 6). A higher percentage of enrollees with asthma who had filled an asthma-related prescription had received leukotriene modifiers (52.8%) than other types of controller medications.

CHIP reimbursed more than \$754,000 for asthma-related medications for enrollees who had a medical service visit for asthma. The average amount reimbursed per claim was approximately \$68 and the average amount reimbursed per asthma enrollee was \$340. CHIP reimbursed more dollars for leukotriene modifiers than any other asthma-related class of medication (\$374,924, see Figure 7).

Figure 6
Percentage of West Virginia CHIP Enrollees with Asthma by Pharmacotherapy Class*, 2005

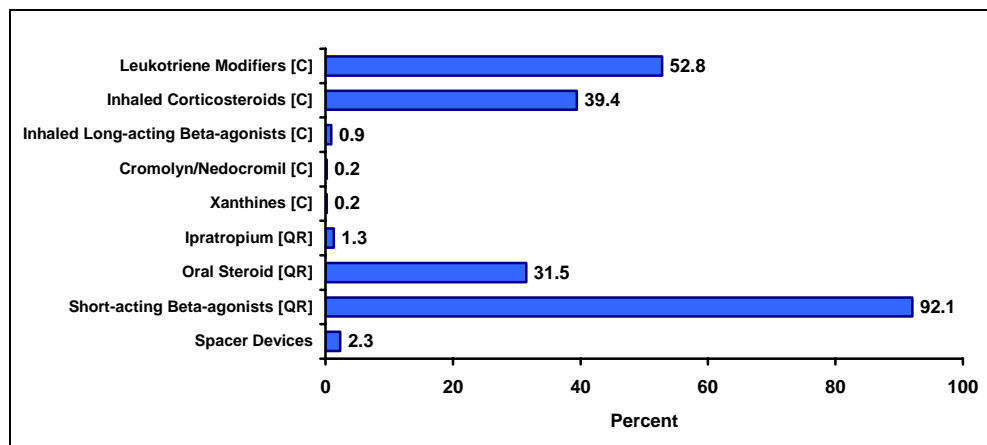
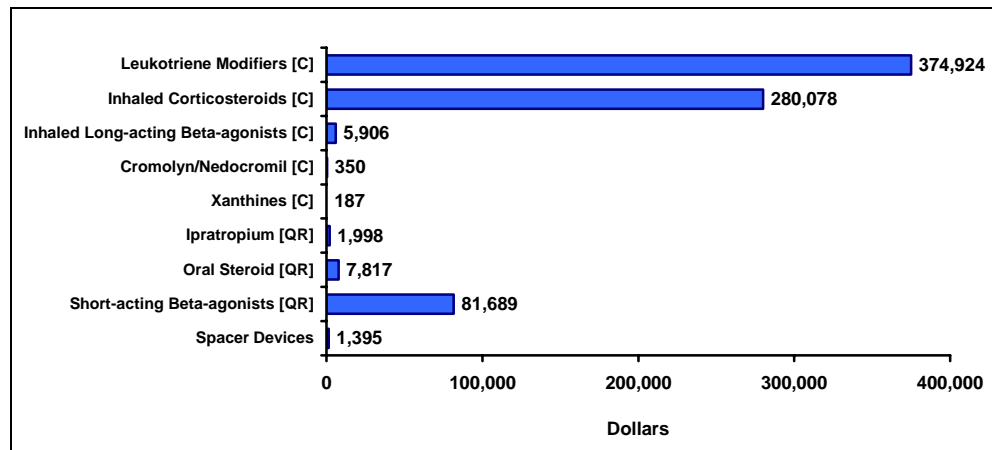


Figure 7
Total Reimbursements by West Virginia CHIP for Asthma-related Prescriptions among Enrollees with Asthma by Pharmacotherapy Class*, 2005



*[C] = Controller Medication; [QR] = Quick-Relief Medication.

Note: Based on enrollees with at least one medical service claim with a primary or secondary diagnosis of asthma and at least one prescription claim for an asthma-related medication.

See Appendix Table A5 and Table A6 for more detail.

REFERENCES

1. West Virginia Children's Health Insurance Program. *2005 Annual Report*. Available online at: http://www.wvchip.org/new_docs/2005%20Annual%20Report.pdf.
2. Centers for Disease Control and Prevention, National Center for Health Statistics, State and Local Area Integrated Telephone Survey, National Survey of Children's Health, 2003. Analysis conducted by West Virginia Health Statistics Center.

APPENDIX

METHODOLOGY

Only fee-for-service paid claims data were used in this analysis. Claims data are administrative data used for billing purposes. They provide information on all medical services and prescriptions billed to CHIP for reimbursement. Disease conditions are identified by analyzing medical services diagnosis codes and prescription claims. CHIP enrollees were identified as having asthma if they had at least one medical service claim (office/clinic, ER, or hospital) with a primary or secondary diagnosis of asthma (ICD-9 CM codes 493.00-493.99), or at least two prescription claims for asthma-related drugs, of which at least one was for a drug other than an oral steroid. Oral steroids are used to treat many conditions other than asthma. Therefore, if an enrollee had a claim for an oral steroid, he/she must also have had an asthma-related prescription claim for a medication in another pharmacotherapy class to be classified as having asthma.

The definition used to identify enrollees with asthma is based on modified criteria of the National Committee for Quality Assurance (NCQA). It is important to note that this methodology may overestimate the prevalence of asthma, asthma-related medical service and prescription use, and asthma-related costs to CHIP. Specifically, medical service claims with only a secondary diagnosis of asthma are included in the rates presented in this brief, although the primary reason for obtaining treatment may be unrelated to asthma. In addition, asthma-related prescriptions are used to treat other respiratory conditions, such as emphysema and bronchitis. Diagnoses are not identified in prescription claims; therefore, it is unknown for what specific condition enrollees are being prescribed asthma-related medications.

Each person identified with asthma was only counted once when estimating a prevalence rate, and an event (such as hospitalization) was only counted once in estimating utilization. The denominator for total prevalence rates was the number of persons enrolled in West Virginia CHIP at any time during fiscal year 2005. Data were de-identified in compliance with HIPAA regulations. This study underwent review and approval by the West Virginia University Institutional Review Board.

Amounts reimbursed by CHIP for asthma-related medical services and prescription medications were used to report total costs for asthma. Costs for ER visits, office/clinic visits, and prescription medications were based on amounts paid by CHIP that were recorded in the claims data. Costs for hospitalizations were calculated using two methods: 1) costs based on the amounts paid by CHIP that were recorded in the claims data, and 2) costs that were estimated using average diagnosis related group (DRG) reimbursement rates for 2005. Both of these hospitalization cost estimates were used to report a range of total asthma costs and asthma-related hospitalization costs.

DETAILED TABLES

Table A1. Prevalence rates of asthma in the West Virginia CHIP population and total CHIP reimbursements for asthma-related services – By demographic category, 2005

Demographic variables	Number of enrollees with asthma ^a (N)	Prevalence rate per 1,000 CHIP enrollees ^b	Total amount reimbursed ^{c,e} (\$)	Average amount reimbursed per enrollee ^{d,e} (\$)
Age (years)				
0-5	772	182	\$327,701 - \$365,945	\$424 - \$474
6-14	2,549	180	\$1,215,912 - \$1,269,847	\$477 - \$498
15-18	765	129	\$302,056 - \$306,391	\$395 - \$401
Gender				
Male	2,299	184	\$1,051,954 - \$1,114,752	\$458 - \$485
Female	1,787	152	\$793,715 - \$827,431	\$444 - \$463
Total	4,086	168	\$1,845,669 - \$1,942,183	\$452 - \$475

- a. Total number of enrollees of West Virginia CHIP who had at least one medical service claim with a primary or secondary diagnosis of asthma or at least two prescription claims for an asthma-related medication (at least one of which was for a drug other than an oral steroid).
- b. Rates based on the number of enrollees of West Virginia CHIP in fiscal year 2005 in each demographic category (Total N = 24,318).
- c. Total = (Amount reimbursed by West Virginia CHIP for enrollees who had a medical service with a primary or secondary diagnosis of asthma, including all asthma-related prescription claims for these enrollees) + (Amount reimbursed for enrollees who did not have medical services for asthma, but who had at least two prescription claims for an asthma-related medication, at least one of which was for a drug other than an oral steroid).
- d. Average amount reimbursed by West Virginia CHIP for asthma-related medical services and prescription drugs per enrollee identified with asthma in that demographic category.
- e. The range of dollars reimbursed reflects the two different methods used to calculate asthma hospitalization costs (see Methodology for a discussion of these methods).

Table A2. Asthma-related office/clinic services among enrollees of West Virginia CHIP and reimbursements by CHIP for the same – By demographic category, 2005

Demographic Variables	Number of office/clinic visits ^a (N)	Rate of office/clinic visits per 1,000 enrollees ^b	Total amount reimbursed ^c (\$)	Average amount reimbursed per visit ^d (\$)
Age (years)				
0-5	1,052	249	\$89,649	\$85
6-14	3,811	269	\$365,984	\$96
15-18	861	145	\$87,771	\$102
Gender				
Male	3,348	267	\$308,832	\$92
Female	2,377	202	\$234,572	\$99
Total	5,725	235	\$543,404	\$95

- a. Total number of office/clinic visits with a primary or secondary diagnosis of asthma among enrollees of West Virginia CHIP.
- b. Rates based on the number of office/clinic visits with a primary or secondary diagnosis of asthma divided by the number of enrollees of West Virginia CHIP in fiscal year 2005 in each demographic category (Total N = 24,318).
- c. Total amount reimbursed by West Virginia CHIP for office/clinic visits with a primary or secondary diagnosis of asthma.
- d. Average amount reimbursed by West Virginia CHIP per office/clinic visit with a primary or secondary diagnosis of asthma.

Table A3. Asthma-related ER services among enrollees of West Virginia CHIP and reimbursements by CHIP for the same – By demographic category, 2005

Demographic Variables	Number of ER visits ^a (N)	Rate of ER visits per 10,000 enrollees ^b	Total amount reimbursed ^c (\$)	Average amount reimbursed per visit ^d (\$)
Age (years)				
0-5	70	165	\$18,312	\$262
6-14	271	191	\$68,521	\$253
15-18	113	192	\$34,838	\$306
Gender				
Male	245	196	\$67,781	\$277
Female	210	178	\$53,890	\$257
Total	455	187	\$121,671	\$267

a. Total number of ER visits with a primary or secondary diagnosis of asthma among enrollees of West Virginia CHIP.

b. Rates based on the number of ER visits with a primary or secondary diagnosis of asthma divided by the number of enrollees of West Virginia CHIP in fiscal year 2005 in each demographic category (Total N = 24,318).

c. Total amount reimbursed by West Virginia CHIP for ER visits with a primary or secondary diagnosis of asthma.

d. Average amount reimbursed by West Virginia CHIP per ER visit with a primary or secondary diagnosis of asthma.

Table A4. Asthma-related inpatient services among enrollees of West Virginia CHIP and reimbursements by CHIP for the same – By demographic category, 2005

Demographic variables	Number of hospital visits ^a (N)	Rate of hospital visits per 10,000 enrollees ^b	Total amount reimbursed ^{c,f} (\$)	Average amount reimbursed per visit ^{d,f} (\$)	Average length of stay per visit ^e (days)
Age (years)					
0-5	26	61	\$31,849 - \$70,093	\$1,225 - \$2,696	1.4
6-14	32	23	\$40,802 - \$94,737	\$1,275 - \$2,961	1.3
15-18	7	12	\$13,878 - \$18,213	\$1,983 - \$2,602	1.3
Gender					
Male	38	30	\$44,235 - \$107,033	\$1,164 - \$2,817	1.4
Female	27	23	\$42,294 - \$76,011	\$1,566 - \$2,815	1.2
Total	65	27	\$86,529 - \$183,043	\$1,331 - \$2,816	1.3

a. Total number of hospital admissions with a primary or secondary diagnosis of asthma among enrollees of West Virginia CHIP.

b. Rates based on the number of hospital admissions with a primary or secondary diagnosis of asthma divided by the number of enrollees of West Virginia CHIP in fiscal year 2005 in each demographic category (Total N = 24,318).

c. Total amount reimbursed by West Virginia CHIP for hospital admissions with a primary or secondary diagnosis of asthma.

d. Average amount reimbursed by West Virginia CHIP per hospital admission with a primary or secondary diagnosis of asthma.

e. Average length of stay per hospital visit with a primary or secondary diagnosis of asthma.

f. The range of dollars reimbursed reflects the two different methods used to calculate asthma hospitalization costs (see Methodology for a discussion of these methods).

Table A5. Asthma-related prescription utilization among enrollees of West Virginia CHIP with asthma and reimbursements by CHIP for the same – By demographic category, 2005


Demographic Variables	Number of enrollees with asthma with a prescription claim (N ₁) ^a	Number of prescription claims (N ₂) ^b	Average number of claims per enrollee ^c	Total amount reimbursed ^d (\$)	Average amount reimbursed per enrollee ^e (\$)
Age (years)					
0-5	413	1,674	4.1	\$129,833	\$314
6-14	1,410	7,525	5.3	\$514,048	\$365
15-18	395	1,890	4.8	\$110,461	\$280
Gender					
Male	1,305	6,668	5.1	\$453,788	\$348
Female	913	4,421	4.8	\$300,555	\$329
Total	2,218	11,089	5.0	\$754,343	\$340

- a. Number of enrollees of West Virginia CHIP who had at least one medical service claim with a primary or secondary diagnosis of asthma and at least one prescription claim for an asthma-related medication.
 b. Number of prescription claims for asthma-related medications for each demographic category.
 c. Average number of prescription claims for asthma-related medications per enrollee in each demographic category.
 d. Total amount reimbursed by West Virginia CHIP for prescriptions for asthma-related medications.
 e. Average amount reimbursed by West Virginia CHIP for asthma-related medications per enrollee.

Table A6. Enrollees of West Virginia CHIP with asthma, prescription claims, and amounts reimbursed by CHIP by pharmacotherapy class, 2005

Pharmacotherapy Class	Number (and %) of enrollees with asthma ^a with a prescription claim (N ₁)		Number (and %) of prescription claims ^b (N ₂)		Total amount reimbursed ^c (\$)	Average amount per claim ^d (\$)
Spacer devices	51	2.3%	52	0.5%	\$1,395	27
Short-acting beta-agonists (all dosage forms)	2,042	92.1%	3,493	31.5%	\$81,689	\$23
Oral corticosteroids	698	31.5%	916	8.3%	\$7,817	\$9
Inhaled corticosteroids	874	39.4%	2,128	19.2%	\$280,078	\$132
Ipratropium	29	1.3%	35	0.3%	\$1,998	\$57
Methylxanthines	5	0.2%	8	0.1%	\$187	\$23
Inhaled Long-acting beta-agonists	21	0.9%	70	0.6%	\$5,906	\$84
Leukotriene modifiers	1,172	52.8%	4,381	39.5%	\$374,924	\$86
Cromolyn/Nedocromil	5	0.2%	6	0.1%	\$350	\$58
Total	2,218	100%^e	11,089	100%^e	\$754,343	\$68

- a. Based on enrollees with at least one medical service claim with a primary or secondary diagnosis of asthma and at least one prescription claim for an asthma-related medication.
 b. Number of prescription claims in each pharmacotherapeutic category.
 c. Total amount reimbursed by West Virginia CHIP for prescriptions in each pharmacotherapeutic category.
 d. Average amount reimbursed by West Virginia CHIP per claim in each pharmacotherapeutic category.
 e. Column sums to more than 100% due to recipients who had claims in more than one pharmacotherapeutic category.



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