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Department of Health Care Policy and Financing

Colorado Medicaid 2004
Asthma Medication Management
Focused Study Evaluation

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Final Report

HSAG
HEALTH SERVICES
ADVISORY GROUP

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Introduction

The asthma medication management focused study was conducted for the Colorado Department of Health Care Policy and Financing (DHCPF) by Colorado Medicaid's External Quality Review Organization, Health Services Advisory Group, Inc. (HSAG). The Colorado Medicaid 2003-2004 Quality Strategy Work Plan identified asthma as one of the top 10 diagnoses for the Medicaid managed care population. Asthma is also the third most common inpatient diagnosis in the Colorado managed care population, comprising 10.4 percent of total inpatient claims. Based on Colorado Hospital Association data, there were nearly 4,000 hospitalizations in Colorado due to asthma in 2000 with more than 1,700 of those among children.¹ Currently, it is estimated that 83,763 children have asthma in Colorado.²

The Colorado Asthma Coalition is a consortium of health care professionals and community members committed to solving the asthma public health crisis. It includes over 100 agencies and has a membership of nearly 450 individuals. The Coalition serves as a catalyst for the development of public education strategies, policies, and an advocacy agenda. The Coalition has played a key role in addressing the public health crisis caused by asthma. The framework of the Coalition provided the infrastructure for the development of a statewide plan. The statewide plan created by the Colorado Public Education and Awareness Workgroup established a goal to increase awareness regarding asthma prevalence rates, the impact of asthma in Colorado, and how to manage the chronic disease, with an emphasis on culturally diverse populations and differing geographic areas of Colorado.³

One of the Colorado Asthma Coalition members is the National Jewish Medical and Research Center (Center). The Center served as the asthma disease management provider for Colorado fee-for-service members between October 2002 and August 2003, under a pilot program to test the cost-effectiveness and clinical efficacy of disease management for Medicaid recipients. The program provided tailored asthma education and telephonic support to caregivers, parents, and participants; it also provided physicians with ongoing clinical reports regarding their patient's health and educational needs. Results of the study, which included data on 150 participants, produced a total dollar savings (after program costs were subtracted) of \$68,833. The study showed significant reductions in emergency room visits, unscheduled physician visits, and caregiver days missed from work. These early results suggest that if these services were provided to the entire population of Colorado Medicaid asthma patients, considerable cost savings would be realized, and patients would have better health and quality of life.

In 1991, the National Asthma Education and Prevention Program (NAEPP) distributed its first series of clinical practice guidelines for the diagnosis and treatment of asthma. These guidelines were based on a comprehensive review of the medical literature. The 1997 update, released as the Expert Panel Report 2 (EPR-2), confirmed the significance of inhaled corticosteroids (ICS) in the treatment of asthma. The 2002 update of EPR-2 issued new evidence-based recommendations for long-term management of asthma that reiterate the worth of low to medium doses of inhaled corticosteroids as the basis of prevailing asthma therapy in children, and recommend that inhaled

corticosteroids are the preferred treatment for all forms of persistent asthma, including for patients as young as 5 years of age (supplanting an initial trial of cromolyn or nedocromil).⁴

Healthy People 2010 concurs with NAEPP that emphasizing the treatment of persistent asthma requires daily long-term therapy aimed at the underlying inflammation and preventing symptoms, rather than relying solely on treating symptoms with short-acting inhaled medication, such as a beta-agonist medication. Healthy People 2010 further affirms that the use of more than one canister of the short-acting inhaled beta-agonist medication per month is an indication of uncontrolled asthma and the need to start or increase long-term preventive therapy.⁵

The National Committee for Quality Assurance (NCQA) Health Plan Employer Data and Information Set (HEDIS[®]) measure, *Use of Appropriate Medications for People With Asthma*, evaluates whether members with persistent asthma are being prescribed medications acceptable as primary therapy for *long-term* control of asthma. This HEDIS measure follows the EPR-2 recommended guidelines. In addition to the HEDIS measure, another important indicator of inappropriate use of asthma medications is the overuse of short-acting beta-agonists. Several studies, and the National Institutes of Health (NIH) National Asthma Education and Prevention Guidelines, indicate that using one or more canisters per month of beta-agonist correlates with poor control of asthma and its consequences.^{6,7,8,9} Studies suggest that the regular use of short-acting beta-agonists can lead to decreased lung function, increased airway responsiveness, and worse asthma control.⁸ This study included assessing utilization of short-acting beta-agonists to complement the HEDIS asthma measure.

Methodology

The asthma study focused on members enrolled in one of the following Colorado Medicaid programs: Primary Care Physician Program (PCPP), unassigned Fee-for-Service (FFS), Colorado Access (CO Access), or Rocky Mountain Health Plan (RMHP).

This focused study utilized the current denominator criteria for *Use of Appropriate Medications for People With Asthma* from the *HEDIS 2004 Technical Specifications, Volume 2* to identify the population as beneficiaries between the ages of 5 and 56 years, as of December 31, 2003, who were continuously enrolled from January 1, 2002, through December 31, 2003, with no more than one 45-day gap of enrollment allowed each year.

HSAG examined administrative and pharmacy claims data provided by DHCPF, RMHP, and CO Access to assess utilization of appropriate medications for the treatment of asthma and the potential overuse of short-acting beta-agonists, defined as 12 or more canisters per year (based on the quantities dispensed field in administrative claims). The two measures were evaluated and reported for ages 5 to 9, 10 to 17, and 18 to 56, as well as for the combined study population.

HEDIS[®] is a registered trademark of the National Committee for Quality Assurance (NCQA).

Summary of Findings

The final population for this focused study consisted of 3,342 Colorado Medicaid members with persistent asthma between 5 and 56 years of age. Since this focused study used only administrative data, no sampling was performed and the entire eligible population was assessed. The table below displays the results of the first measure, *Use of Appropriate Medications for People With Asthma*.

The goal for the first measure, *Use of Appropriate Medications for People With Asthma*, was based on the NCQA National Medicaid HEDIS 2003 50th Percentile of 63.7 percent. Overall, the Colorado Medicaid rate of 72.0 percent was statistically higher than the NCQA National Medicaid HEDIS 2003 50th Percentile and above the NCQA National Medicaid HEDIS 2003 90th Percentile of 70.9 percent. The rates for both the PCPP and FFS programs were consistently higher than the two managed care plans for all age groups.

Table 1-1—Use of Appropriate Medications for People With Asthma					
Age Group	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Ages 5 to 9 Years	69.4% N = 736	66.9% N = 248	59.6% N = 52	71.8% N = 312	72.6% N = 124
Ages 10 to 17 Years	72.3% N = 949	66.9% N = 323	71.9% N = 57	76.0% N = 400	74.0% N = 169
Ages 18 to 56 Years	72.9% N = 1,657	68.5% N = 492	70.6% N = 143	74.5% N = 608	76.6% N = 414
Overall (5 to 56 Years)	72.0% N = 3,342	67.6% N = 1,063	68.7% N = 252	74.3% N = 1,320	75.3% N = 707

The results for the second measure, *Overuse of Inhaled, Short-Acting Beta-Agonists*, are displayed in the table below. This measure is not a HEDIS measure and does not have comparable rates at this time. The goal for this measure, *Overuse of Inhaled, Short-Acting Beta-Agonists*, will be established following the results of this focused study.

Table 1-2—Overuse of Inhaled, Short-Acting Beta-Agonists					
Age Group	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Ages 5 to 9 Years	4.6% N = 736	5.2% N = 248	9.6% N = 52	4.5% N = 312	1.6% N = 124
Ages 10 to 17 Years	7.6% N = 949	11.5% N = 323	7.0% N = 57	6.3% N = 400	3.6% N = 169
Ages 18 to 56 Years	12.7% N = 1,657	21.3% N = 492	7.7% N = 143	9.9% N = 608	8.5% N = 414
Overall (5 to 56 Years)	9.5% N = 3,342	14.6% N = 1,063	7.9% N = 252	7.5% N = 1,320	6.1% N = 707

Note: Low rates are better for this measure. At this time, there are no benchmarks established for this measure.

Table 1-3 below displays the frequency of the most commonly prescribed inhaled, short-acting beta-agonists (or canisters) for the members in this focused study. Using one or more canisters per month (or more than 12 per year) of inhaled, short-acting beta-agonist correlates with poor control of asthma.

The average Colorado Medicaid member with asthma received 3.9 canisters per year. This number is well below the threshold of 12 canisters per year. For those members who actually received 12 or more canisters during the year, the average member received 18.3 canisters, or about 3 canisters every two months. The most common type of canister (or short-acting beta-agonist) prescribed was albuterol.

Table 1-3—Most Commonly Prescribed Short-Acting Beta-Agonists					
	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Average Number of Prescribed Short-Acting Beta-Agonists Canisters for All Members with Asthma	3.9 Canisters	5.4 Canisters	3.8 Canisters	3.3 Canisters	3.0 Canisters
Average Number of Prescribed Short-Acting Beta-Agonists Canisters, Excluding Members Without a Prescription	6.0 Canisters	7.0 Canisters	5.3 Canisters	5.4 Canisters	5.4 Canisters
Average Number of Prescribed Short-Acting Beta-Agonists Canisters for Members with 12 or More Canisters	18.3 Canisters	18.8 Canisters	17.3 Canisters	18.1 Canisters	17.2 Canisters
Most Commonly Prescribed Inhaled, Short-Acting Beta-Agonists	N =10,638	N =4,526	N =828	N =3,610	N =1,674
Albuterol	96.1%	98.1%	99.5%	92.7%	90.9%
Maxair Autohaler	2.2%	1.1%	0.5%	3.7%	2.8%
Proventil HFA	1.9%	0.6%	0.0%	2.7%	4.7%
Alupent	0.4%	0.2%	0.0%	0.5%	0.8%
Ventolin	0.1%	0.0%	0.0%	0.1%	0.5%
Proventil	0.1%	0.0%	0.0%	0.3%	0.2%

Conclusions and Recommendations

The main findings from this focused study showed:

- ◆ The Colorado Medicaid program rate (72.0 percent) for the first measure, *Use of Appropriate Medications for People With Asthma*, was above the 2003 NCQA National Medicaid HEDIS 90th Percentile of 70.9 percent.
- ◆ The *Use of Appropriate Medications for People With Asthma* measure rates for the two health plans (CO Access and RMHP) were consistently lower than the rates for PCPP and FFS.
- ◆ The average Colorado Medicaid member with asthma received 3.9 canisters for inhaled, short-acting beta-agonists.
- ◆ Members in the 18-56 year age group were prescribed short-acting beta-agonists nearly twice as often as the other age groups. For those members who received 12 or more canisters of a short-acting beta-agonist, the average member received 18.3 canisters.
- ◆ There appears to be a direct correlation between the first measure, *Use of Appropriate Medications for People With Asthma*, and the second measure for *Overuse of Inhaled, Short-Acting Beta-Agonists*. A high rate for the first measure is usually associated with a low rate for the second measure.

The rates show that the Colorado Medicaid program performs well for asthma medication management.

The results from the two quality indicators tend to indicate the vast majority of members with asthma appear to be in control, as defined by this focused study. However, for those members who used more than 12 canisters of a short-acting beta-agonist, the results indicate these members may need more intense case management.

HSAG recommends that the data from this study be used to identify members overusing short-acting beta-agonists for targeted intervention. Typically, the older members had a higher rate for overuse of short-acting beta-agonists. In addition, the use of study data to identify members who failed to fill monthly prescriptions for inhaled corticosteroids can further refine the target group.

Provider-prescribing practices can also be profiled to identify outliers regarding dispensing, prescribing, and adherence to asthma management guidelines. These targeted physicians can provide a study base in which to implement a practice-based asthma disease management intervention.

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Introduction

The asthma medication management focused study was conducted for the Colorado Department of Health Care Policy and Financing (DHCPF) by Colorado Medicaid's External Quality Review Organization, Health Services Advisory Group, Inc. (HSAG). The Colorado Medicaid 2003-2004 Quality Strategy Work Plan identified asthma as one of the top 10 diagnoses for the Medicaid managed care population. It is the fifth most common ambulatory diagnosis, comprising 9.3 percent of the total ambulatory claims in the managed care population. Asthma is also the third most common inpatient diagnosis in the Colorado managed care population, comprising 10.4 percent of total inpatient claims.

The NCQA HEDIS measure, *Use of Appropriate Medications for People With Asthma*, evaluates whether members with persistent asthma are being prescribed medications acceptable as primary therapy for long-term control of asthma. This HEDIS measure follows the guidelines recommended by the National Asthma Education and Prevention Program, known as the Expert Panel Report 2. The appropriate medications are updated yearly and available on the NCQA Web site. In addition to the HEDIS measure, one important indicator of inappropriate use of asthma medications is the overuse of short-acting beta-agonists.

This focused study evaluates the services received by the beneficiaries diagnosed with asthma within four Colorado Medicaid programs, and assesses utilization of appropriate medications for the treatment of asthma and overuse of inhaled short-acting beta-agonists. Whenever possible, national Medicaid benchmarks (i.e., the NCQA National HEDIS 2003 Percentiles) are presented for comparisons. The study will allow DHCPF and Colorado Medicaid programs to assess their rates compared to national statistics, and monitor appropriate and inappropriate use of medications for the treatment of asthma.

It should be noted that the dates of this study coincide with the statewide implementation of pharmacy co-payments for Medicaid recipients. For generic or multi-source drugs, the co-payment is \$1 per prescription or refill. It is \$3 per prescription or refill for single-source or brand name pharmaceuticals. Each pharmacy provider is responsible for collecting the appropriate co-payment from the recipient at the time that the prescription is filled. However, the provider may not deny a prescription to a recipient if the individual is unable to pay the co-payment.

Background

Asthma rates are increasing nationwide and the impact on health and the economy is substantial. Recent analysis of the economic impact of asthma, commissioned by the American Lung Association to study asthma costs, cited the annual estimated cost in 2002 of \$14 billion.¹⁰ Management of asthma is critical, and neglect of the condition frequently results in hospitalization, emergency department (ED) visits, and missed work and school days.

In 2001, asthma accounted for approximately 454,000 hospitalizations, an estimated 1.7 million ED visits, and approximately 11.3 million physician office visits.¹⁰ Problems with poor patient compliance to recommended therapies and various physician and patient barriers have led to difficulties in implementation of successful health outcomes in communities, which may explain the increased rate of asthma hospitalization and mortality despite significant advances in medical technologies over the past few years.

According to the 2002 Behavioral Risk Factor Surveillance System report, the current asthma prevalence rate reported for adults in Colorado was 7.7 percent of the population, while the rate for the U.S. population was 7.5 percent.¹¹

Nationally, the number of children with asthma more than doubled between 1980 and 1995. Rates for children under the age of 5 increased over 160 percent during the same period. According to the Centers for Disease Control and Prevention, emergency departments nationwide recorded 658,000 visits for asthma among children under the age of 15 in 1999.¹⁰ Based on Colorado Hospital Association data, there were nearly 4,000 hospitalizations in Colorado due to asthma in 2000 with more than 1,700 of those among children.¹² Currently, it is estimated that 83,763 children have asthma in Colorado, up from 48,757 in 2003.¹³

Successful management of asthma can be accomplished for most asthmatics if they take medications that provide long-term control. Learning how to manage asthma as a chronic disease is a major challenge for people with asthma and their families. Numerous approaches have been developed and implemented in a variety of community settings including schools, clinics, and homes. These approaches include comprehensive strategies such as education, skill development, counseling, and environmental control strategies.

Study Goals and Objectives

The goal of the asthma medication management focused study was to evaluate the extent to which Colorado Medicaid members with asthma receive appropriate medication management. The asthma study assesses utilization of short-acting beta-agonists to complement the HEDIS asthma measure and allows DHCPF and the Medicaid programs to monitor overuse of inhaled short-acting beta-agonists, defined as 12 or more canisters per year.

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Overview

The asthma study focused on members enrolled in one of the following Colorado Medicaid programs: PCPP, FFS, CO Access, or RMHP. The study population was limited to beneficiaries between the ages of 5 and 56 years, as of December 31, 2003, who were continuously enrolled from January 1, 2002, through December 31, 2003, with no more than one 45-day gap of enrollment allowed each year.

The asthma study was conducted using only administrative data (i.e., claims and encounter data); no medical record abstraction was performed.

All beneficiaries having persistent asthma were included in the study. Persistent asthma is defined by the *HEDIS 2004 Technical Specifications, Volume 2* as having had any of the following events during 2002:

- ◆ At least four asthma medication-dispensing events; or
- ◆ At least one ED visit with a primary diagnosis of asthma; or
- ◆ At least one hospitalization with a primary diagnosis of asthma; or
- ◆ At least four outpatient visits with a corresponding diagnosis of asthma and at least two asthma medication-dispensing events.

A complete description of the *HEDIS 2004 Technical Specifications* for identifying members with asthma can be found in Appendix A.

Measures

Two measures were evaluated and reported for ages 5 to 9, 10 to 17, and 18 to 56, as well as for the combined study population.

Use of Appropriate Medications for People With Asthma was calculated as the percent of members in the study population who received at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines during 2003.

Overuse of Inhaled, Short-Acting Beta-Agonists was calculated as the percent of members in the study population who received dispensed prescriptions for 12 or more canisters of inhaled, short-acting beta-agonists during 2003. The number of canisters of short-acting beta-agonists was determined by examining the “quantity dispensed” field for each submitted claim. For pharmacy claims for inhaled short-acting beta-agonists, this field contains multiples of the product canister size. Dividing each claim by the appropriate product canister size (based on the National Drug Code Directory, or NDC) yields the number of canisters dispensed.

The goal for the first measure, *Use of Appropriate Medications for People With Asthma*, was based on the National Medicaid HEDIS 2003 50th Percentile. *Overuse of Inhaled, Short-Acting Beta-Agonists* was a benchmark measure with no established national benchmarks or comparative rates. The goal for the second measure, *Overuse of Inhaled, Short-Acting Beta-Agonists*, will be established after the baseline year data are available.

Data Collection

Each health plan provided a database to HSAG containing the population of members enrolled in the health plan who had asthma, along with pharmacy claims information. For the PCPP and FFS population, HSAG obtained the information from DHCPF and determined the asthma population using the specified criteria.

HSAG examined administrative and pharmacy claims data provided by DHCPF, RMHP, and CO Access to assess utilization of appropriate medications for the treatment of asthma and potential overuse of short-acting beta-agonists. The list of inhaled, short-acting beta-agonists used in this report can be found in Appendix B.

Limitations

Providers who are not paid on a fee-for-service basis (e.g., capitated providers) may render services, but may neglect to submit the encounter to the managed care plan. Since this focused study relied on encounter data, rates may actually be higher than what is reported in the Results section. The eligible population of members who had asthma was identified using the HEDIS 2004 Technical Specifications, which calls for the use of both claims/encounter data and pharmacy data. Underreporting of encounter data for capitated providers may result in fewer members with asthma identified as part of the eligible population.

The results of this focused study were not adjusted based on the severity level or health status of the members. The level of severity or any comorbid conditions for the members with asthma in the four different populations (i.e., CO Access, RMHP, PCPP, and FFS) was unknown. It is possible members in one health plan may have more health related issues (e.g., a higher percentage of smokers) or different levels of severity in their asthma, and therefore require more intense treatment. This may result in higher utilization of services. For example, members with a higher level of severity may use more inhaled, short-acting beta-agonists.

This focused study addresses members with persistent asthma and who were enrolled in Colorado Medicaid for a considerable amount of time. Results should not be extrapolated to the general asthma population.

Key Findings

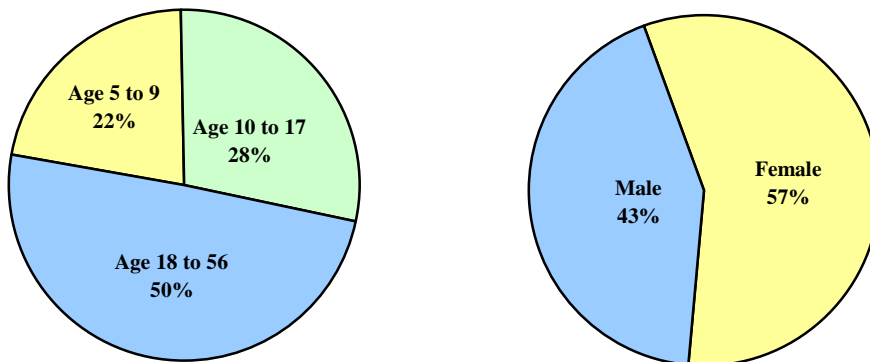
Study Population Characteristics

The final population for this focused study consisted of 3,342 Colorado Medicaid members with persistent asthma between 5 and 56 years of age. Since this focused study used only administrative data, no sampling was performed and the entire eligible population was assessed.

Figure 4-1 below displays the distribution by age group and gender for the eligible population of members in this focused study.

Figure 4-1—Age and Gender Distribution for Colorado Medicaid Members with Persistent Asthma, Between 5 and 56 Years of Age

Population = 3,342



Half of the eligible members were in the 18 to 56 year age group. Members in the 5 to 9 year age group and 10 to 17 year age group made up 22 and 28 percent of the eligible population, respectively. The majority (57 percent) of the members were female.

Individual age and gender distribution by program are provided in Table 4-1 below. Both the FFS and RMHP populations had a higher percentage of members in the 18 to 56 year age group than CO Access and the PCPP program.

Overall, the PCPP population was the largest (1,320 members out of 3,342 total members in the study). CO Access (1,063 cases) had the second largest population, followed by FFS, at 707 cases, and RMHP (252 cases).

The gender distribution for the FFS population showed a lower percentage of females (and higher percentage of males) than the other Colorado Medicaid programs.

Table 4-1—Age and Gender Distribution by Colorado Medicaid Program

Demographic	CO Access		RMHP		PCPP		FFS	
	N	%	N	%	N	%	N	%
Age								
5 to 9 Years	248	23.3%	52	20.6%	312	23.6%	124	17.5%
10 to 17 Years	323	30.4%	57	22.6%	400	30.3%	169	23.9%
18 to 56 Years	492	46.3%	143	56.8%	608	46.1%	414	58.6%
Total 5 to 56 Years	1,063	100.0%	252	100.0%	1,320	100.0%	707	100.0%
Gender								
Female	621	58.4%	152	60.3%	740	56.1%	386	54.6%
Male	441	41.5%	96	38.1%	580	43.9%	321	45.4%
Unknown	1	0.1%	4	1.6%	0	0.0%	0	0.0%

Key Findings: Use of Appropriate Medications for People With Asthma

Table 4-2 below shows the percent of Medicaid members, 5 to 56 years of age, in the study population who received at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines during 2003.

Table 4-2—Use of Appropriate Medications for People With Asthma					
Age Group	Sample Size	Colorado Medicaid Rate	95% Confidence Interval	Medicaid HEDIS 50th Percentile	P-Value
Ages 5 to 9 Years	736	69.4%	66.1 – 72.9	61.8%	0.000*
Ages 10 to 17 Years	949	72.3%	69.4 – 75.4	63.0%	0.000*
Ages 18 to 56 Years	1,657	72.9%	70.8 – 75.2	65.3%	0.000*
Overall (5 to 56 Years)	3,342	72.0%	70.4 – 73.6	63.7%	0.000*

* The difference between the Colorado Medicaid Rate and the Medicaid HEDIS 50th Percentile is statistically significant (P-Value < 0.05) for all of the age groups.

Results

The 5 to 9 year age group had the lowest rate at 69.4 percent, while the 10 to 17 and 18 to 56 year age groups had nearly identical rates of 72.3 and 72.9 percent, respectively.

Overall, the Colorado Medicaid rate of 72.0 percent was 8.3 percentage points above the Medicaid HEDIS 50th Percentile. The rate for each age group was also above the Medicaid HEDIS 50th Percentile. The p-value shown in the table indicates all of the rates were statistically higher than the Medicaid HEDIS 50th Percentile.

Table 4-3 below shows the Colorado Medicaid program rates compared to the 2003 NCQA National Medicaid HEDIS Percentiles.

Table 4-3—Comparison of Colorado Medicaid Rates to HEDIS 2003 National Medicaid Percentiles					
Age Group	Colorado Medicaid	HEDIS 2003 National Medicaid Percentiles			
		25th	50th	75th	90th
5 to 9	69.4%	51.0%	61.8%	66.4%	72.1%
10 to 17	72.3%	56.5%	63.0%	66.3%	71.3%
18 to 56	72.9%	59.9%	65.3%	69.9%	73.7%
Overall	72.0%	58.2%	63.7%	67.9%	70.9%

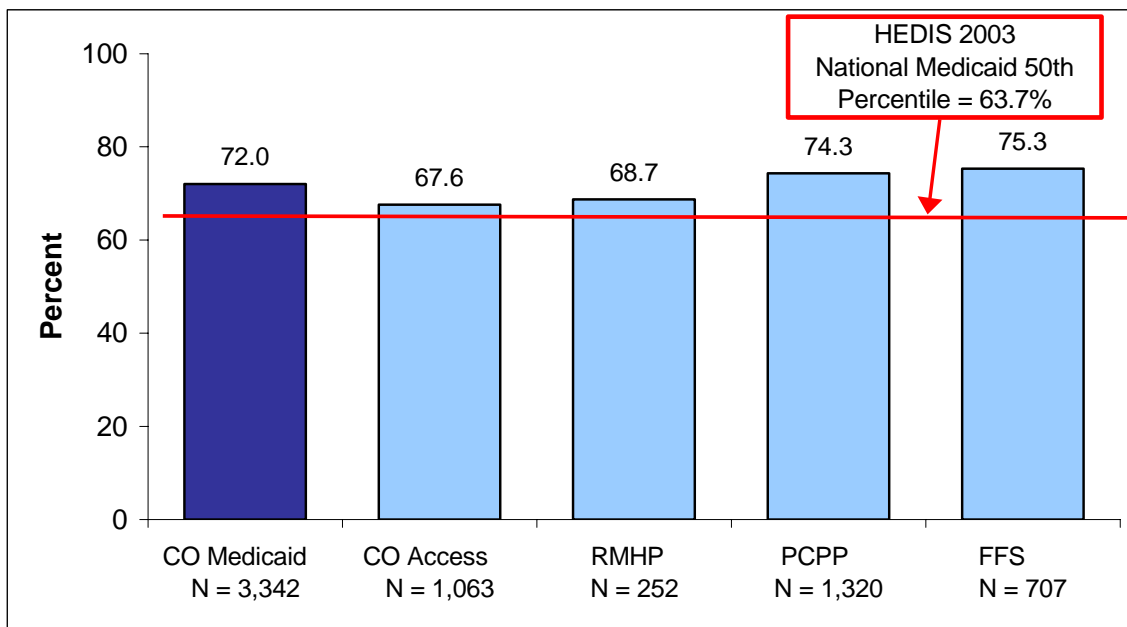
Results

The overall Colorado Medicaid rate and the rate for those in the 10 to 17 year old age group was above the 2003 NCQA National Medicaid HEDIS 90th Percentile, while the Colorado Medicaid rate for the 5 to 9 and 18 to 56 years of age was above the 75th Percentile.

Figure 4-2 below presents program comparisons of the *Use of Appropriate Medications for People With Asthma* for the combined rate (5 to 56 years of age).

The entire eligible population was used for this study since the methodology consisted of using only administrative data (i.e., claims and encounter data). The eligible population is shown in Figure 4-2 and ranges from 252 cases for RMHP to 1,320 for the PCPP population. The total eligible Colorado Medicaid population consisted of 3,342 cases.

Figure 4-2—Use of Appropriate Medications for People With Asthma, 5 to 56 Years of Age



Results

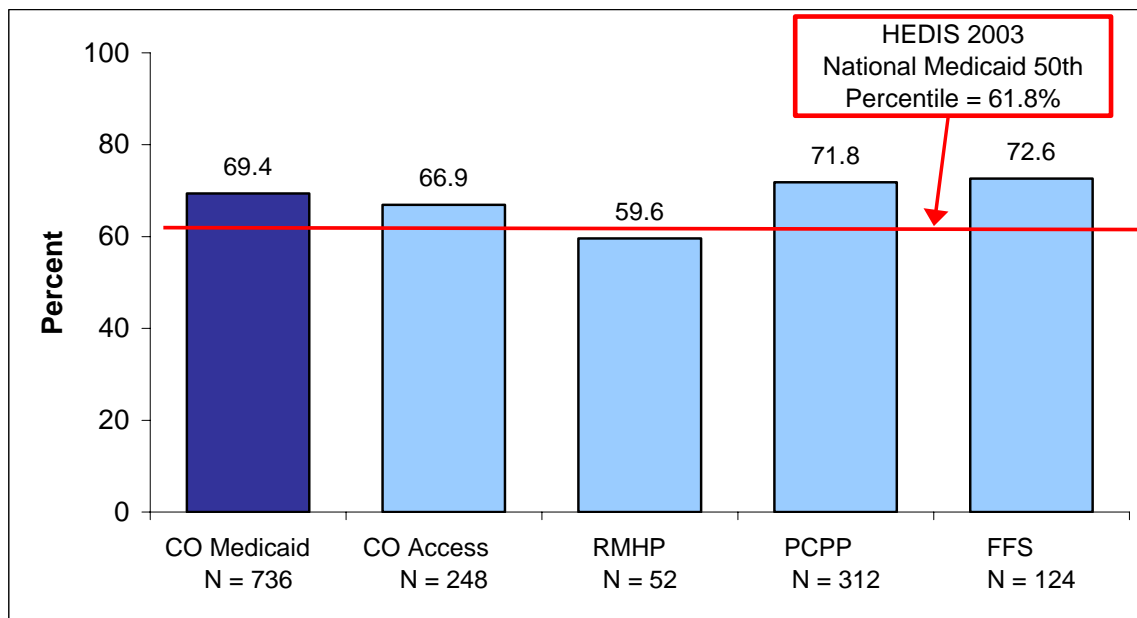
The overall Colorado Medicaid rate was 72.0 percent, or 8.3 percentage points higher than the HEDIS 2003 National Medicaid 50th Percentile of 63.7 percent.

All of the individual health plan rates were above the HEDIS 2003 National Medicaid 50th Percentile, ranging from 67.6 percent for CO Access to 75.3 percent for the Medicaid FFS program. The rates for the two health plans (CO Access and RMHP) were more than 5 percentage points lower than the rates for PCPP and FFS.

Figure 4-3 below presents program comparisons of the *Use of Appropriate Medications for People With Asthma* for members 5 to 9 years of age.

The eligible population is shown in Figure 4-3 and ranges from 52 cases for RMHP to 312 cases for the PCPP population. The total eligible Colorado Medicaid population for the 5 to 9 age group consisted of 736 cases.

Figure 4-3—Use of Appropriate Medications for People With Asthma, 5 to 9 Years of Age



Results

The overall Colorado Medicaid rate for the 5 to 9 year age group was 69.4 percent, or 7.6 percentage points higher than the HEDIS 2003 National Medicaid 50th Percentile of 61.8 percent.

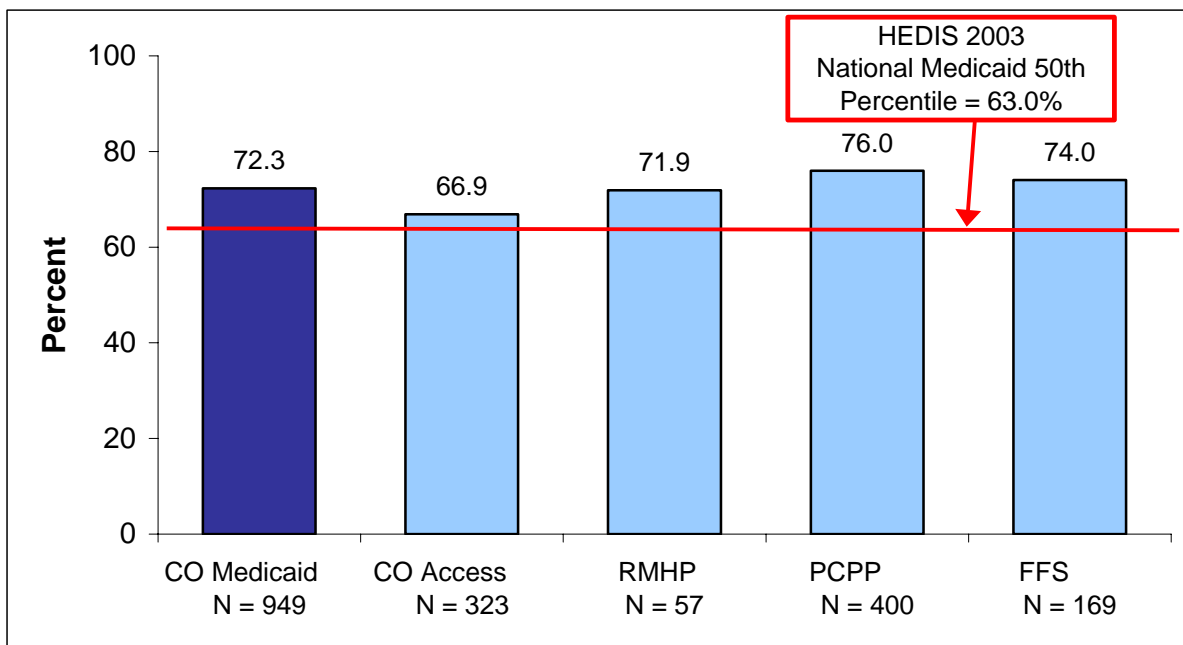
The rates for CO Access (66.9 percent), PCPP (71.8 percent) and FFS (72.6 percent) were all above the HEDIS 2003 National Medicaid 50th Percentile of 61.8 percent. RMHP, at 59.6 percent, was below the 50th percentile for this age group.

The rates for the two health plans (CO Access and RMHP) were lower than the PCPP rate and more than 5 percentage points lower than FFS rate.

Figure 4-4 below presents program comparisons of the *Use of Appropriate Medications for People With Asthma* for members 10 to 17 years of age.

The eligible population is shown in Figure 4-4 and ranges from 57 cases for RMHP to 400 cases for the PCPP population. The total eligible Colorado Medicaid population for the 10 to 17 age group consisted of 949 cases.

Figure 4-4—Use of Appropriate Medications for People With Asthma, 10 to 17 Years of Age



Results

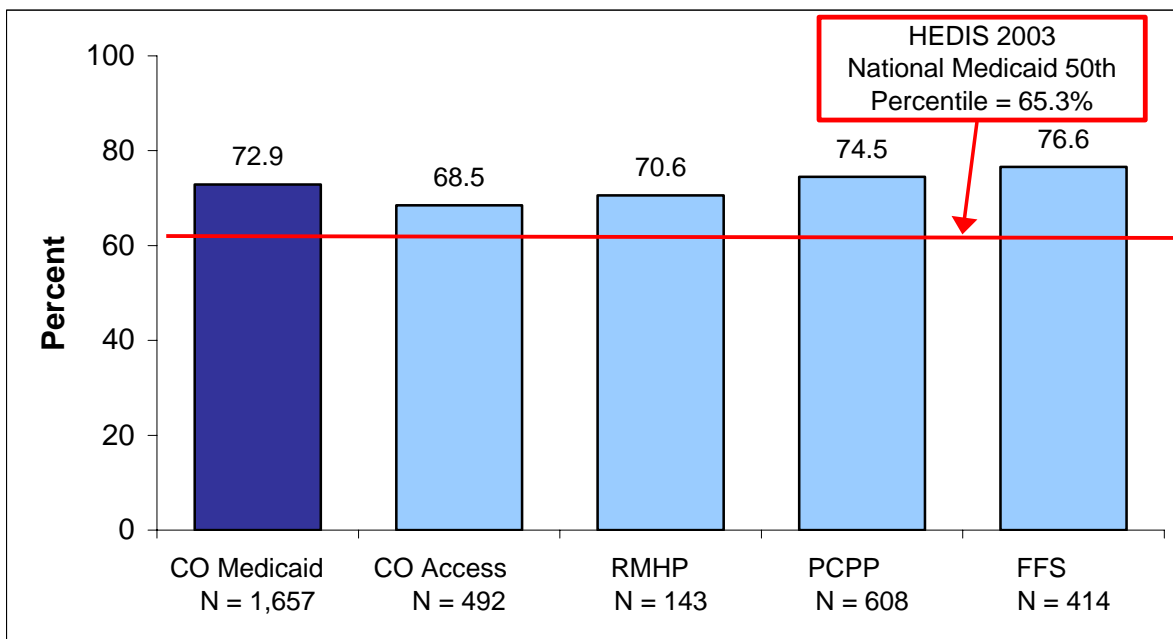
The overall Colorado Medicaid rate for the 10 to 17 year age group was 72.3 percent, or 9.3 percentage points higher than the HEDIS 2003 National Medicaid 50th Percentile of 63.0 percent.

All of the individual program rates were above the HEDIS 2003 National Medicaid 50th Percentile, ranging from 66.9 percent for CO Access to 76.0 percent for the Medicaid PCPP program. The rates for the two health plans (CO Access and RMHP) were lower than the rates for PCPP and FFS.

Figure 4-5 below presents program comparisons of the *Use of Appropriate Medications for People With Asthma* for members 18 to 56 years of age.

The eligible population is shown in Figure 4-5 and ranges from 143 cases for RMHP to 608 cases for the PCPP population. The total eligible Colorado Medicaid population for the 18 to 56 age group consisted of 1,657 cases.

Figure 4-5—Use of Appropriate Medications for People With Asthma, 18 to 56 Years of Age



Results

The overall Colorado Medicaid rate for the 18 to 56 year age group was 72.9 percent, or 7.6 percentage points higher than the HEDIS 2003 National Medicaid 50th Percentile of 65.3 percent.

All of the individual program rates were above the HEDIS 2003 National Medicaid 50th Percentile, ranging from 68.5 percent for CO Access to 76.6 percent for the Medicaid FFS program. The rates for the two health plans (CO Access and RMHP) were lower than the rates for PCPP, and more than 6 percentage points lower than the FFS rate.

Overuse of Inhaled, Short-Acting Beta-Agonists

Table 4-4 below displays the frequency of the most commonly prescribed inhaled, short-acting beta-agonists (or canisters) for the members in this focused study. Using one or more canisters per month (or more than 12 per year) of inhaled, short-acting beta-agonist correlates with poor control of asthma.

The average Colorado Medicaid member with asthma received 3.9 canisters per year. This number is well below the threshold of 12 canisters per year. Additionally, if those members who did not receive a prescription for a short-acting beta-agonist are excluded, then the average number of canisters prescribed is 6.0, or one canister every two months. For those members who actually received 12 or more canisters during the year, the average member received 18.3 canisters, or about 3 canisters every two months.

The results tend to indicate that the vast majority of members with asthma appear to be utilizing appropriate medications, as defined by this focused study. However, for those members who used more than 12 canisters, the results indicate these members may need intense case management.

Table 4-4—Most Commonly Prescribed Short-Acting Beta-Agonists					
	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Average Number of Prescribed Short-Acting Beta-Agonists Canisters for All Members with Asthma	3.9 Canisters	5.4 Canisters	3.8 Canisters	3.3 Canisters	3.0 Canisters
Average Number of Prescribed Short-Acting Beta-Agonists Canisters, Excluding Members Without a Prescription	6.0 Canisters	7.0 Canisters	5.3 Canisters	5.4 Canisters	5.4 Canisters
Average Number of Prescribed Short-Acting Beta-Agonists Canisters for Members with 12 or More Canisters	18.3 Canisters	18.8 Canisters	17.3 Canisters	18.1 Canisters	17.2 Canisters
Most Commonly Prescribed Inhaled, Short-Acting Beta-Agonists	N =10,638	N =4,526	N =828	N =3,610	N =1,674
Albuterol	96.1%	98.1%	99.5%	92.7%	90.9%
Maxair Autohaler	2.2%	1.1%	0.5%	3.7%	2.8%
Proventil HFA	1.9%	0.6%	0.0%	2.7%	4.7%
Alupent	0.4%	0.2%	0.0%	0.5%	0.8%
Ventolin	0.1%	0.0%	0.0%	0.1%	0.5%
Proventil	0.1%	0.0%	0.0%	0.3%	0.2%

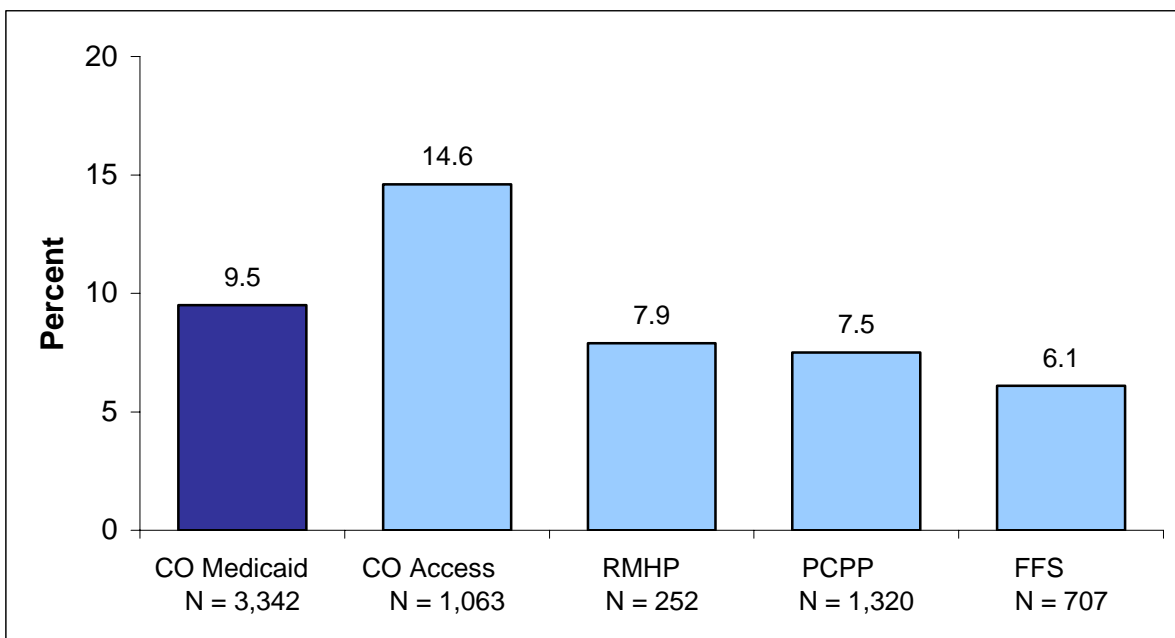
Of the approximately 135 inhaled, short-acting beta-agonists (see Appendix B) included in this focused study, only six were prescribed in the time period for this population. Albuterol (96.1 percent) was the most commonly prescribed short-acting beta-agonist, followed by Maxair

Autohaler at 2.2 percent, and Proventil HFA at 1.9 percent. Alupent, Ventolin, and Proventil were prescribed less than 1.0 percent of the time.

Figure 4-6 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for the combined rate (5 to 56 years of age).

The entire eligible population was used for this study since the methodology consisted of using only administrative data (i.e., claims and encounter data). The eligible population is shown in Figure 4-6 and ranges from 252 cases for RMHP to 1,320 for the PCPP population. The total eligible Colorado Medicaid population consisted of 3,342 cases.

Figure 4-6—Overuse of Inhaled, Short-Acting Beta-Agonists, 5 to 56 Years of Age



Note: Low rates are better for this measure. At this time, there are no benchmarks established for this measure.

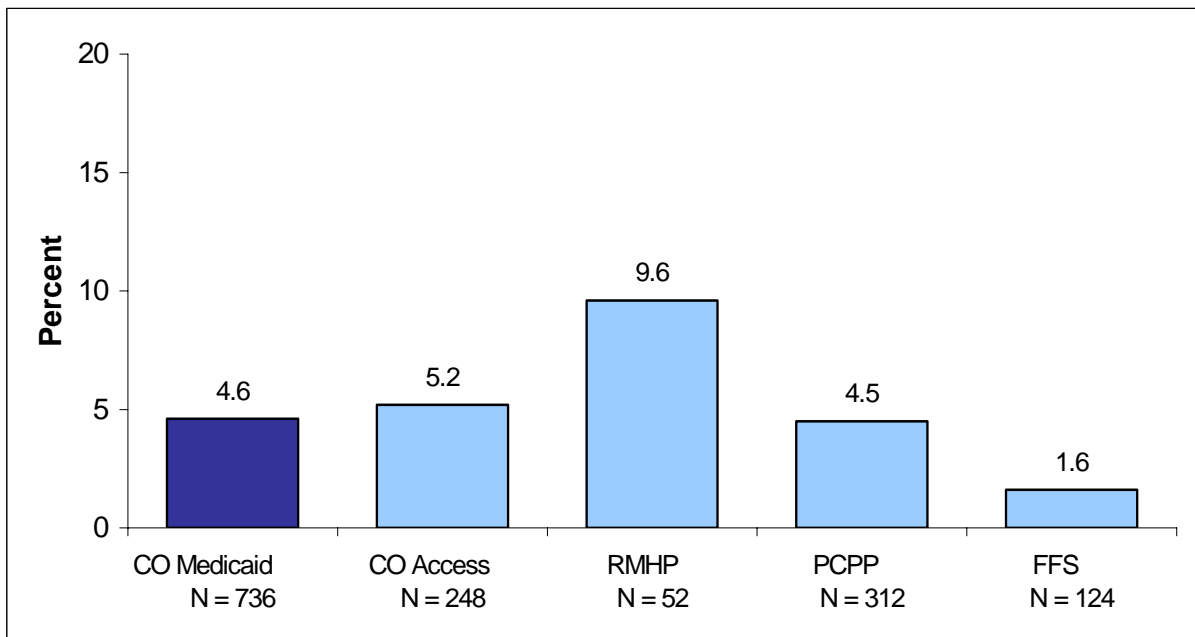
Results

The Colorado Medicaid rate for this measure was 9.5 percent. The program rates ranged from 6.1 percent for the FFS population to 14.6 percent for members with asthma enrolled in CO Access.

Figure 4-7 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 5 to 9 years of age.

The eligible population is shown in Figure 4-7 and ranges from 52 cases for RMHP to 312 cases for the PCPP population. The total eligible Colorado Medicaid population for the 5 to 9 age group consisted of 736 cases.

Figure 4-7—Overuse of Inhaled, Short-Acting Beta-Agonists, 5 to 9 Years of Age



Note: Low rates are better for this measure. At this time, there are no benchmarks established for this measure.

Results

For the 5 to 9 year age group, the Colorado Medicaid rate was 4.6 percent. The health plan rates ranged from 1.6 percent for the FFS population to 9.6 percent for members with asthma enrolled in RMHP.

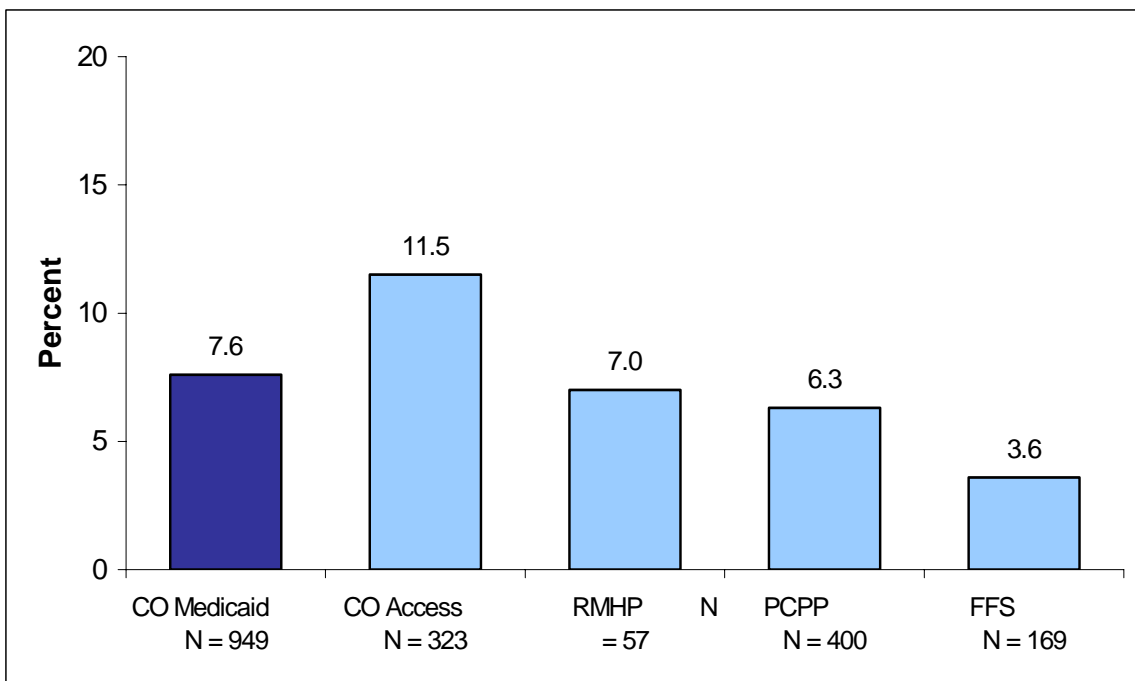
The rates for both the FFS and PCPP programs were under 5.0 percent for this measure. The FFS rate was particularly low, and may indicate Medicaid members 5 to 9 years of age:

- ◆ Tend to receive fewer prescriptions for inhaled, short-acting beta-agonists due to better patient health or the members are in better control for their asthma-related symptoms; or
- ◆ Tend to receive fewer prescriptions for inhaled, short-acting beta-agonists due to fewer physician office visits.

Figure 4-8 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 10 to 17 years of age.

The eligible population is shown in Figure 4-8 and ranges from 57 cases for RMHP to 400 cases for the PCPP population. The total eligible Colorado Medicaid population for the 10 to 17 age group consisted of 949 cases.

Figure 4-8—Overuse of Inhaled, Short-Acting Beta-Agonists, 10 to 17 Years of Age



Note: Low rates are better for this measure. At this time, there are no benchmarks established for this measure.

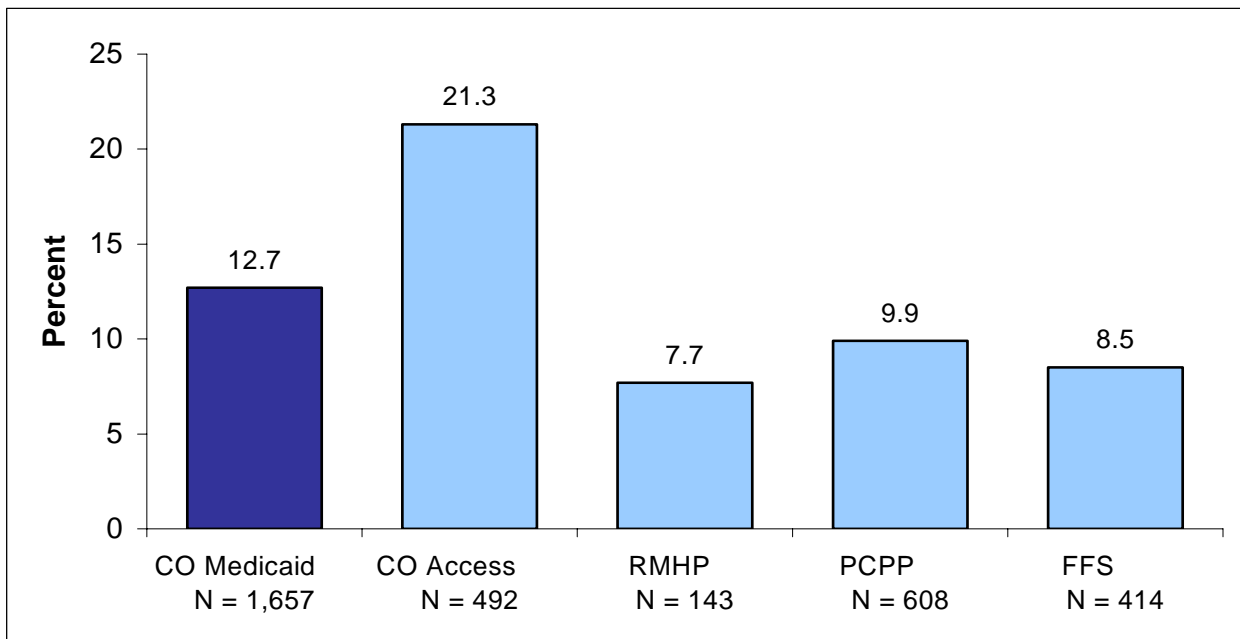
Results

The Colorado Medicaid rate was 7.6 percent for the 10 to 17 year age group. The health plan rates ranged from 3.6 percent for the FFS population to 11.5 percent for members with asthma enrolled in CO Access.

Figure 4-9 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 18 to 56 years of age.

The eligible population is shown in Figure 4-9 and ranges from 143 cases for RMHP to 608 cases for the PCPP population. The total eligible Colorado Medicaid population for the 18 to 56 age group consisted of 1,657 cases.

Figure 4-9—Overuse of Inhaled, Short-Acting Beta-Agonists, 18 to 56 Years of Age



Note: Low rates are better for this measure. At this time, there are no benchmarks established for this measure.

Results

For the 18 to 56 year age group, the Colorado Medicaid rate was 12.7 percent. The health plan rates ranged from 7.7 percent for the RMHP population to 21.3 percent for members with asthma enrolled in CO Access.

The health plan rates for this age group were generally higher than the other two age groups, with the exception of RMHP. This may indicate an increased need for asthma education among the adult population.

See Appendix C for the summary of rates tables.

5. Overall Medicaid Conclusions and Recommendations

Introduction

In 1991, the National Asthma Education and Prevention Program (NAEPP) distributed its first series of clinical practice guidelines for the diagnosis and treatment of asthma. These guidelines were based on a comprehensive review of the medical literature. Since then, the quantity of support for these recommendations has increased so much that the first guidelines have been updated twice. The 1997 update, released as the Expert Panel Report 2 (EPR-2), confirmed the significance of inhaled corticosteroids in the treatment of asthma. The 2002 update of EPR-2 issued new evidence-based recommendations for long-term management of asthma that reiterate the worth of low to medium doses of inhaled corticosteroids as the basis of prevailing asthma therapy in children, and recommend that inhaled corticosteroids are the preferred treatment for all forms of persistent asthma, including for patients as young as 5 years of age (supplanting an initial trial of cromolyn or nedocromil). The guidelines further recommend that leukotriene modifiers, etc., be used as add-on therapies since the literature supports that they demonstrate no impact on lung function and are quite expensive. The HEDIS measure, *Use of Appropriate Medications for People With Asthma*, follows these EPR-2 recommended guidelines.

Overall Conclusions

The main findings from this focused study showed:

- ◆ The Colorado Medicaid program rate (72.0 percent) for *Use of Appropriate Medications for People With Asthma* was above the 2003 NCQA National Medicaid HEDIS 90th Percentile of 70.9 percent.
- ◆ The *Use of Appropriate Medications for People With Asthma* rates for the two health plans (CO Access and RMHP) were consistently lower than the rates for PCPP and FFS.
- ◆ The average Colorado Medicaid member with asthma received 3.9 canisters for inhaled, short-acting beta-agonists.
- ◆ Members in the 18 to 56 year age group were prescribed short-acting beta-agonists nearly twice as often as the other age groups. For those members who received 12 or more canisters of short-acting beta-agonists, the average member received 18.3 canisters.
- ◆ There appears to be a direct correlation between the first measure, *Use of Appropriate Medications for People with Asthma*, and the second measure for *Overuse of Inhaled, Short-Acting Beta-Agonists*. A high rate for the first measure is usually associated with a low rate for the second measure.

The results from the two quality indicators tend to indicate the vast majority of members with asthma appear to be receiving appropriate medications, as defined by this focused study. However, for those members who used more than 12 canisters of a short-acting beta-agonist, the results indicate these members may need more intense case management.

Overall Recommendations

The rates show that the Colorado Medicaid program performs well for asthma medication management. General overall recommendations are provided below.

1. HSAG recommends that future studies measure consistent use of inhaled corticosteroids, along with the current HEDIS asthma measure as appropriate use of asthma medication. The standard for inhaled corticosteroid use is ongoing daily use since evidence shows that once inhaled corticosteroids are stopped, asthma symptoms and airway inflammation and subsequent hyper-responsiveness return.
2. As with all practice guidelines, regardless of the strength of the protocols, disease management cannot excel without the successful application of the guidelines by the provider who delivers care to the patient. A physician education/disease management program can be extremely helpful in ensuring the appropriate application of practice guidelines in the office setting.
3. HSAG recommends that the data from this study be used to identify members overusing short-acting beta-agonists for targeted intervention. Patients who overuse short-acting beta-agonists are usually out of control. In addition, the use of study data to identify members who failed to fill monthly subscriptions for inhaled corticosteroids can further refine the target group. Population groups that are out of control are more likely to use emergency room, urgent care, and hospital services. A targeted intervention could be based on recommendations from Healthy People 2010, which advises an asthma action plan be developed under their physician's guidance. The plan should explain when and how to take medicines correctly, as well as what to do when asthma worsens. Additionally, self-management skills to manage and control their disease should be included in the plan.
4. In addition to identifying target patient groups, provider-prescribing practices can be profiled to identify outliers regarding dispensing, prescribing, and adherence to asthma management guidelines. These targeted physicians can provide a study base in which to implement a practice-based asthma disease management intervention.

HEDIS 2004 Technical Specifications, Volume 2

The current *HEDIS 2004 Technical Specifications, Volume 2* were used to identify the population as follows:

Denominator

The percentage of enrolled Colorado Medicaid members 5 to 56 years of age as of December 31, 2003, who were identified as having persistent asthma during 2002.

The member must have been enrolled in the health plan, PCPP, or Medicaid FFS as of December 31, 2003.

The member must have been continuously enrolled in the health plan, PCPP, or Medicaid FFS in 2002 and 2003, with only one 45-day gap of enrollment allowed each year.

Members were identified as having *persistent* asthma by having **ANY** of the following during 2002:

- ◆ At least four asthma medication dispensing events.
- ◆ At least one emergency room visit with asthma (ICD-9 code 493) as the principal diagnosis.
- ◆ At least one hospitalization based on the visit codes listed below with asthma as the principal diagnosis.
- ◆ At least four outpatient asthma visits based on the visit codes below with asthma as one of the listed diagnoses codes (i.e., does not have to be primary diagnosis) **AND** at least two asthma medication dispensing events.

Acute Inpatient (Hospitalizations)

CPT Codes: 99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99261-99263, 99291, 99292

Revenue Codes: 100-169, 200-229, 987

Emergency Department

CPT Codes: 99281-99285, 99288

Revenue Codes: 450, 451, 452, 459, and 981

Outpatient Visit

CPT Codes: 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99271-99275

Revenue Codes: 456, 510, 515 - 517, 520, 521, 523, 526, 760 –769, 770, 779, 982, 983, 988

Numerators

Numerator #1

The percentage of members in the denominator who received at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines during 2003.

Numerator #2

The percentage of members in the denominator who received dispensed prescriptions for 12 or more canisters of inhaled, short-acting beta-agonists during 2003. Note that more than one canister may be dispensed on a given date. Only short-acting beta-agonist-type inhalers were used for this numerator. Specifically excluded: long-acting beta-agonists, inhaled corticosteroids, inhaled anti-inflammatories, methylxanthines, nebulized medications, oral bronchodilators, leukotriene modifiers, and mast cell stabilizers.

Appendix B. **NDC Codes for Short-Acting Beta-Agonists**

Appendix B contains tables that present the NDC codes for short-acting beta-agonists.

GENERIC DESCRIPTION	NDC CODE	LABEL CODE	CLASS
albuterol 90 mcg/inh inhalation aerosol with adapter	00047299711	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00085061402	Proventil 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00085061403	Proventil 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00085061510	Proventil 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00172439018	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00172439019	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00173032188	Ventolin 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00173032198	Ventolin 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00173046300	Ventolin 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00364263217	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00364263298	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	00403177118	Proventil 90 mcg inhaler	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	00403225118	Ventolin 90mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00472126463	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	00472126478	ALBUTEROL AER 90MCG	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00536041612	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00536041613	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00536121612	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00536121613	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00603100475	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00603100499	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00677154970	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00677154971	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00781750287	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00781750288	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00839760807	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00839760880	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/DOSE	00904287534	ALBUTEROL AER 90MCG/AC	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/DOSE	00904287557	ALBUTEROL AER REFILL	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	00904507834	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	00904507868	ALBUTEROL AER 90MCG	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	00904507934	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	49502030317	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	49502030327	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	49502033317	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	49502033327	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists

GENERIC DESCRIPTION	NDC CODE	LABEL CODE	CLASS
albuterol 90 mcg/inh inhalation aerosol with adapter	50111080131	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	50111080132	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	52493084701	PROVENTIL AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	52493084717	PROVENTIL AER 90MCG	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	52555059417	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	52555059418	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	52959112100	PROVENTIL AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	52959129301	VENTOLIN AER 90MCG	short-acting beta agonists
Albuterol Inhal Aerosol 90 MCG/ACT	52959142103	ALBUTEROL AER 90MCG	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	53002090264	Proventil 90 mcg inhaler	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	53002090265	Proventil 90 mcg inhaler	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54569005200	PROVENTIL AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54569100300	VENTOLIN AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54569100800	PROVENTIL AER 90MCG RF	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54569101100	VENTOLIN AER 90MCG	short-acting beta agonists
Albuterol Inhal Aerosol 90 MCG/ACT	54569424500	ALBUTEROL AER 90MCG	short-acting beta agonists
Albuterol Sulfate Inhal Aero 120 MCG/ACT (100MCG Base Equiv)	54569462100	PROVENTIL AER HFA	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54868073001	VENTOLIN AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54868104101	PROVENTIL AER 90MCG	short-acting beta agonists
Albuterol Inhal Aerosol 90 MCG/ACT	54868373900	ALBUTEROL AER 90MCG RF	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54977069501	PROVENTIL AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	54977070601	VENTOLIN AER 90MCG	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	55045148605	Proventil 90 mcg inhaler	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	55175256801	Proventil 90 mcg inhaler	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	55175257201	VENTOLIN AER 90MCG	short-acting beta agonists
Albuterol Inhal Aerosol 90 MCG/ACT	55175257501	ALBUTEROL AER 90MCG	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	55953005101	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	55953005153	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	57362011601	VENTOLIN AER 90MCG	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	58016605901	Proventil 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	58016605917	Proventil 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	58016609901	Ventolin 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	58016620501	Proventil 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	58016631617	Ventolin 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	58016656901	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists

GENERIC DESCRIPTION	NDC CODE	LABEL CODE	CLASS
albuterol 90 mcg/inh inhalation aerosol	58980010817	Respirol 90 mcg/inh inhalation aerosol	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	59723012201	Ventolin 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	59772617501	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	59772617502	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol with adapter	59930156001	Albuterol Sulfate 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol 90 mcg/inh inhalation aerosol	59930156002	Albuterol Sulfate 90 mcg/inh inhalation aerosol	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	60346033176	PROVENTIL AER 90MCG RF	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	60346038476	VENTOLIN AER 90MCG RF	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	60346039476	VENTOLIN AER 90MCG	short-acting beta agonists
ALBUTEROL INHAL AEROSOL 90 MCG/ACT	60346040876	PROVENTIL AER 90MCG	short-acting beta agonists
Albuterol 90 mcg/inh inhalation	62037079444	Albuterol 90 mcg inhaler	short-acting beta agonists
albuterol sulfate 108 mcg/inh inhalation aerosol with adapter	00085113201	Proventil HFA 108 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
albuterol sulfate 108 mcg/inh inhalation aerosol with adapter	00085113202	Proventil HFA 108 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	00024106001	TORNALATE IN AER .37MG/AC	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	00024106101	TORNALATE RF AER .37MG/AC	short-acting beta agonists
Bitolterol Mesylate Inhal Aerosol 0.8%	53002052373	TORNALATE IN AER .37MG/AC	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	54569100500	TORNALATE IN AER .37MG/AC	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	54868354900	TORNALATE IN AER .37MG/AC	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	55175257301	Tornalate 0.37 mg inhaler	short-acting beta agonists
BITOLTEROL MESYLATE INHAL AEROSOL 0.8%	58016652360	Tornalate 0.37 mg inhaler	short-acting beta agonists
bitolterol mesylate 0.37 mg/inh inhalation aerosol	51479001201	Tornalate 0.37 mg/inh inhalation aerosol	short-acting beta agonists
bitolterol mesylate 0.37 mg/inh inhalation aerosol	51479001202	Tornalate 0.37 mg/inh inhalation aerosol	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW	00000106201	Metaproterenol 15mg/ml MDI 650mcg	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW	00000123501	Metaproterenol 15mg/ml MDI 650mcg	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	00054355140	METAPROTEREN AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	00078020953	METAPREL INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	00078020957	METAPREL INH AER .65/ACT	short-acting beta agonists
Metaproterenol Sulfate Inhal Aerosol	00597007086	Alupent 650 mcg w/adapter	
Metaproterenol Sulfate Inhal Aerosol	00597007095	Alupent 650 mcg	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	52493080710	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	52493080715	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	52959100300	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	54569004500	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	54569273200	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	54569345200	ALUPENT REF AER .65/ACT	short-acting beta agonists

GENERIC DESCRIPTION	NDC CODE	LABEL CODE	CLASS
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	54868104301	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	54868250901	METAPREL INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	55175152001	METAPREL INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	55175152101	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	55175441001	METAPROTEREN AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	60346042747	ALUPENT INH AER .65/ACT	short-acting beta agonists
metaproterenol sulfate 0.65 mg/inh inhalation aerosol with adapter	00054355240	Metaproterenol Sulfate 0.65 mg/inh inhalation aerosol with adapter	short-acting beta agonists
metaproterenol sulfate 0.65 mg/inh inhalation aerosol with adapter	00597007017	Alupent 0.65 mg/inh inhalation aerosol with adapter	short-acting beta agonists
metaproterenol sulfate 0.65 mg/inh inhalation aerosol	00597007018	Alupent 0.65 mg/inh inhalation aerosol	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	55947020615	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	58016600201	ALUPENT INH AER .65/ACT	short-acting beta agonists
METAPROTERENOL SULFATE INHAL AEROSOL POW 0.65 MG/ACT	58016653700	ALUPENT INH AER .65/ACT	short-acting beta agonists
metaproterenol sulfate 0.65 mg/inh inhalation aerosol with adapter	58016653714	Alupent 0.65 mg/inh inhalation aerosol with adapter	short-acting beta agonists
PIRBUTEROL INHAL AEROSOL 200 MCG	52493086926	MAXAIR INH AER 200MCG	short-acting beta agonists
Pirbuterol Acetate Breath Activated Inhal Aerosol 200MCG/INH	54569461500	MAXAIR AUTOH AER 200MCG	short-acting beta agonists
Pirbuterol Acetate Breath Activated Inhal Aerosol 200MCG/INH	55175520501	MAXAIR AUTOH AER 200MCG	short-acting beta agonists
PIRBUTEROL INHAL AEROSOL 200 MCG	60346020797	MAXAIR INH AER 200MCG	Xanthines
pirbuterol acetate 0.2 mg/inh inhalation aerosol with adapter	00089079021	Maxair 0.2 mg/inh inhalation aerosol with adapter	short-acting beta agonists
pirbuterol acetate 0.2 mg/inh inhalation aerosol with adapter	00089081521	Maxair Autohaler 0.2 mg/inh inhalation aerosol with adapter	short-acting beta agonists
pirbuterol acetate 0.2 mg/inh inhalation aerosol with adapter	00089081710	Maxair Autohaler 0.2 mg/inh inhalation aerosol with adapter	short-acting beta agonists
pirbuterol acetate 0.2 mg/inh inhalation aerosol with adapter	54569225300	Maxair 0.2 mg/inh inhalation aerosol with adapter	short-acting beta agonists
pirbuterol acetate 0.2 mg/inh inhalation aerosol with adapter	54868282101	Maxair Autohaler 0.2 mg/inh inhalation aerosol with adapter	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	52493081308	BRETHAIRE AER 0.2MG	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	54569101400	BRETHAIRE AER 0.2MG	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	54569101500	BRETHAIRE RF AER 0.2MG	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	54868291100	BRETHAIRE AER 0.2MG	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	54977068001	BRETHAIRE RF AER 0.2MG	short-acting beta agonists
TERBUTALINE SULFATE INHAL AEROSOL SOLN 0.2 MG/ACT	58016623301	BRETHAIRE AER 0.2MG	short-acting beta agonists
terbutaline sulfate 0.2 mg/inh inhalation aerosol	00028555787	Brethaire 0.2 mg/inh inhalation aerosol	short-acting beta agonists
terbutaline sulfate 0.2 mg/inh inhalation aerosol with adapter	00028555788	Brethaire 0.2 mg/inh inhalation aerosol	short-acting beta agonists

Table C-1—Use of Appropriate Medications for People With Asthma

Age Group	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Ages 5 to 9 Years	69.4% N = 736	66.9% N = 248	59.6% N = 52	71.8% N = 312	72.6% N = 124
Ages 10 to 17 Years	72.3% N = 949	66.9% N = 323	71.9% N = 57	76.0% N = 400	74.0% N = 169
Ages 18 to 56 Years	72.9% N = 1,657	68.5% N = 492	70.6% N = 143	74.5% N = 608	76.6% N = 414
Overall (5 to 56 Years)	72.0% N = 3,342	67.6% N = 1,063	68.7% N = 252	74.3% N = 1,320	75.3% N = 707

Table C-2—Overuse of Short-Acting Beta-Agonists

Age Group	Colorado Medicaid	CO Access	RMHP	PCPP	FFS
Ages 5 to 9 Years	4.6% N = 736	5.2% N = 248	9.6% N = 52	4.5% N = 312	1.6% N = 124
Ages 10 to 17 Years	7.6% N = 949	11.5% N = 323	7.0% N = 57	6.3% N = 400	3.6% N = 169
Ages 18 to 56 Years	12.7% N = 1,657	21.3% N = 492	7.7% N = 143	9.9% N = 608	8.5% N = 414
Overall (5 to 56 Years)	9.5% N = 3,342	14.6% N = 1,063	7.9% N = 252	7.5% N = 1,320	6.1% N = 707

Rates by Colorado Medicaid Program

CO Access

Table C-3—Rates for CO Access					
Age Group	Eligible Population	Use of Appropriate Medications for People With Asthma		Use of Short-Acting Beta-Agonists*	
		%	CI	%	CI
Age 5 – 9	248	66.9%	61.1 – 72.8	5.2%	2.5 – 8.0
Age 10 – 17	323	66.9%	61.7 – 72.0	11.5%	8.0 – 14.9
Age 18 – 56	492	68.5%	64.4 – 72.6	21.3%	17.7 – 25.0
Combined Rate	1,063	67.6%	64.8 – 70.5	14.6%	12.5 – 16.7

*Percent of eligible members who received 12 or more canisters of an inhaled, short-acting beta-agonist during 2003.

RMHP

Table C-4—Rates for RMHP					
Age Group	Eligible Population	Use of Appropriate Medications for People With Asthma		Use of Short-Acting Beta-Agonists*	
		%	CI	%	CI
Age 5 – 9	52	59.6%	45.3 – 73.9	9.6%	1.6 – 17.6
Age 10 – 17	57	71.9%	59.4 – 84.5	7.0%	0.4 – 13.6
Age 18 – 56	143	70.6%	62.8 – 78.4	7.7%	3.3 – 12.1
Combined Rate	252	68.6%	62.7 – 74.6	7.9%	4.6 – 11.3

*Percent of eligible members who received 12 or more canisters of an inhaled, short-acting beta-agonist during 2003.

PCPP

Table C-5—Rates for PCPP					
Age Group	Eligible Population	Use of Appropriate Medications for People With Asthma		Use of Short-Acting Beta-Agonists*	
		%	CI	%	CI
Age 5 – 9	312	71.8%	66.6 – 76.9	4.5%	2.2 – 6.8
Age 10 – 17	400	76.0%	71.7 – 80.3	6.3%	3.9 – 8.6
Age 18 – 56	608	74.5%	71.0 – 78.1	9.9%	7.5 – 12.2
Combined Rate	1,320	74.3%	71.9 – 76.7	7.5%	6.1 – 8.9

*Percent of eligible members who received 12 or more canisters of an inhaled, short-acting beta-agonist during 2003.

FFS

Table C-6—Rates for FFS					
Age Group	Eligible Population	Use of Appropriate Medications for People With Asthma		Use of Short-Acting Beta-Agonists*	
		%	CI	%	CI
Age 5 – 9	124	72.6%	64.3 – 80.8	1.6%	0.0 – 3.8
Age 10 – 17	169	74.0%	67.1 – 80.9	3.6%	0.8 – 6.3
Age 18 – 56	414	76.6%	72.4 – 80.8	8.5%	5.8 – 11.1
Combined Rate	707	75.3%	72.0 – 78.5	6.1%	4.3 – 7.8

*Percent of eligible members who received 12 or more canisters of an inhaled, short-acting beta-agonist during 2003.