

State of Colorado



Department of Health Care Policy and Financing

**FY 06–07**  
**COLORADO ASTHMA MEDICATION**  
**MANAGEMENT FOCUSED STUDY**

June 2007



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<b>1. Executive Summary .....</b>	<b>1-1</b>
Introduction.....	1-1
Methodology .....	1-1
Summary of Findings.....	1-2
Conclusions and Recommendations .....	1-4
Overall Recommendations .....	1-5
References .....	1-6
<b>2. Introduction and Background .....</b>	<b>2-1</b>
Introduction.....	2-1
Background .....	2-1
Study Goals and Objectives .....	2-2
References .....	2-3
<b>3. Methodology .....</b>	<b>3-1</b>
Overview.....	3-1
Measures.....	3-2
Data Collection .....	3-2
Limitations .....	3-2
References .....	3-4
<b>4. Results.....</b>	<b>4-1</b>
Study Population Characteristics.....	4-1
Measure 1: Use of Appropriate Medications for People With Asthma .....	4-2
Measure 2: Use of Short-Acting Beta-Agonists.....	4-7
<b>5. Overall Medicaid Conclusions and Recommendations.....</b>	<b>5-1</b>
Introduction.....	5-1
Overall Conclusions.....	5-1
Overall Recommendations .....	5-2
<b>Appendices</b>	
Appendix A–Technical Specifications.....	A-1
Appendix B–NDC Codes for Short-Acting Beta-Agonists.....	B-1

## Introduction

Asthma is a chronic disease of the lungs characterized by sudden, recurring attacks of difficult breathing, wheezing, and coughing. This chronic disease has been on a steep rise since 1980 and is estimated to affect nearly 20 million Americans, including 6.3 million children. The Colorado Medicaid 2003–2004 Quality Strategy Work Plan identified asthma as one of the top 10 diagnoses for the Medicaid managed care population. Based on Colorado Hospital Association data, there were nearly 3,400 hospitalizations in Colorado due to asthma in 2005.<sup>1-1</sup> According to the American Lung Association’s State of the Air: 2007 report, an estimated 92,458 children have asthma in Colorado.<sup>1-2</sup>

The FY 06–07 Colorado Asthma Medication Management Focused Study was conducted for the Colorado Department of Health Care Policy & Financing (the Department) by Colorado Medicaid’s external quality review organization, Health Services Advisory Group, Inc. (HSAG). This focused study evaluated the services received by Colorado Medicaid beneficiaries in four Colorado Medicaid programs who had been diagnosed with asthma, and assessed the use of appropriate medications for the treatment of asthma and the overuse of inhaled, short-acting beta-agonists. The study will allow the Department and Colorado Medicaid programs to assess their rates compared with national statistics and monitor appropriate and inappropriate use of medications for the treatment of asthma.

This FY 06–07 asthma focused study was built on the findings of the FY 03–04 study by reporting asthma care. The study included four Colorado Medicaid programs: the Colorado Medicaid Primary Care Physician Program (PCPP), the unassigned fee-for-service (FFS) program, and two health plans—Denver Health Medicaid Choice (DHMC) and Rocky Mountain Health Plans (RMHP).

## Methodology

The study population consisted of Medicaid beneficiaries between 5 and 56 years of age as of December 31, 2006, who were continuously enrolled and identified as having persistent asthma during 2005 and 2006. Based on the 2007 Health Plan Employer Data and Information Set (HEDIS<sup>®</sup>) technical specifications, the following focused study defined persistent asthma as any of the following events:

- ◆ At least four asthma medication dispensing events
- ◆ At least one emergency department visit with a primary diagnosis of asthma
- ◆ At least one hospitalization with a primary diagnosis of asthma
- ◆ At least four outpatient visits with a corresponding diagnosis of asthma and at least two asthma medication dispensing events

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HEDIS<sup>®</sup> is a registered trademark of the National Committee for Quality Assurance (NCQA).

Two indicators were evaluated and reported in the current focused study. These measures were based on administrative data and used the entire eligible population; no sampling was employed. Further, the results were stratified by the following age groups: 5 to 9 years of age, 10 to 17 years of age, and 18 to 56 years of age. Also, when appropriate, comparisons were made to the original FY 03–04 Colorado Medicaid asthma baseline study. However, due to population changes in the distribution of members across Colorado Medicaid programs, caution should be used when interpreting differences in performance between study years.

The first measure, *Use of Appropriate Medications for People With Asthma*, is an NCQA HEDIS measure. This indicator evaluates whether Colorado Medicaid members with persistent asthma are being prescribed medications acceptable as primary therapy for long-term control of asthma. The second measure evaluates the overuse of inhaled, short-acting beta-agonists. Several studies along with the National Institutes of Health (NIH) National Asthma Education and Prevention Guidelines indicate that using one or more canisters per month of beta-agonists correlates with poor control of asthma and its consequences.<sup>1-3,4,5,6</sup> Both of these measures were evaluated in the original FY 03–04 Colorado Medicaid asthma focused study.

## Summary of Findings

Overall, the eligible population consisted of 2,246 Colorado Medicaid beneficiaries with persistent asthma between 5 and 56 years of age. Colorado Medicaid members 5 to 9 years of age had the smallest population (26.0 percent). The two oldest age groups each accounted for more than one-third of the total asthmatic population (10 to 17 years of age = 35.8 percent, and 18 to 56 years of age = 38.1 percent). Considerable variation in the distribution of members by age was identified across individual Colorado Medicaid programs.

Table 1-1 displays the results of the first measure, *Use of Appropriate Medications for People With Asthma*. Overall, the Colorado Medicaid rate (84.4 percent) for the current study was 12.4 percentage points higher than the FY 03–04 Colorado Medicaid rate (72.0 percent). However, while an improvement in the use of appropriate asthma medications was noted across all Medicaid programs and age groups, the overall Colorado Medicaid rate was somewhat lower than the NCQA 2006 HEDIS national Medicaid 50th percentile (87.1 percent). None of the Colorado Medicaid programs met this standard. Only the rate for children 5 to 9 years of age (92.6 percent) was higher than the national 50th percentile for its age group (90.2 percent).

Table 1-1—Use of Appropriate Medications for People With Asthma							
Age Group	FY 03–04 Colorado Medicaid	FY 06–07					NCQA 2006 HEDIS National Medicaid 50th Percentile
		Colorado Medicaid	DHMC	RMHP	PCPP	FFS	
5 to 9 Years	69.4% N=736	92.6% N=685	90.9% N=22	97.4% N=39	90.9% N=154	93.0% N=370	90.2%
10 to 17 Years	72.3% N=949	86.7% N=805	85.2% N=27	79.5% N=39	87.8% N=205	86.9% N=534	87.4%
18 to 56 Years	72.9% N=1,657	76.5% N=856	77.9% N=86	85.9% N=99	75.9% N=266	74.3% N=405	84.9%
<b>Overall (5 to 56 Years)</b>	<b>72.0%</b> <b>N=3,342</b>	<b>84.4%</b> <b>N=2,246</b>	<b>81.5%</b> <b>N=135</b>	<b>87.0%</b> <b>N=177</b>	<b>83.5%</b> <b>N=625</b>	<b>84.7%</b> <b>N=1,309</b>	<b>87.1%</b>

The results of the second measure, *Overuse of Inhaled, Short-Acting Beta-Agonists*, are displayed in Table 1-2. Short-acting beta-agonists remain an effective treatment of choice for relieving acute asthma episodes. Daily use is generally not recommended. In general, using one or more canisters per month (or more than 12 canisters per year) of an inhaled, short-acting beta-agonist is an indication of poor control of asthma. As such, a lower percentage equates to better control of asthma. There are no national benchmarks available for this measure.

Table 1-2—Overuse of Inhaled, Short-Acting Beta-Agonists						
Age Group	FY 03–04 Colorado Medicaid	FY 06–07				
		Colorado Medicaid	DHMC	RMHP	PCPP	FFS
5 to 9 Years	4.6% N=736	5.0% N=585	0.0% N=22	2.6% N=39	5.2% N=154	5.4% N=370
10 to 17 Years	7.6% N=949	11.3% N=805	29.6% N=27	12.8% N=39	13.7% N=205	9.4% N=534
18 to 56 Years	12.7% N=1,657	18.5% N=856	31.4% N=86	18.2% N=99	16.5% N=266	17.0% N=405
<b>Overall (5 to 56 Years)</b>	<b>9.5%</b> <b>N=3,342</b>	<b>12.4%</b> <b>N=2,246</b>	<b>25.9%</b> <b>N=135</b>	<b>13.6%</b> <b>N=177</b>	<b>12.8%</b> <b>N=625</b>	<b>10.6%</b> <b>1,309</b>

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

Table 1-2 shows that 12.4 percent of the Colorado Medicaid population with persistent asthma used 12 or more canisters of an inhaled, short-acting beta-agonist in FY 06–07. This result represents a 2.9 percentage point increase from the rate in FY 03–04 (9.5 percent) and a small decline in overall performance. In general, overuse of beta-agonists was most prevalent among adults 18 to 56 years of age (18.5 percent), with children 5 to 9 years of age exhibiting the least amount of overuse (5.0 percent). While this age-based pattern was consistent across all Colorado Medicaid programs, considerable variation was noted across total plan rates.

Table 1-3 shows the average number of canisters of inhaled, short-acting beta-agonists prescribed to Colorado Medicaid members.

Table 1-3—Average Number of Prescribed Short-Acting Beta-Agonists						
	Colorado Medicaid	RMHP	DHMC	PCPP	All Health Plans and PCPP	FFS
Average Number of Prescribed Short-Acting Beta-Agonist Canisters for All Members With Asthma	5.2 Canisters	6.2 Canisters	9.0 Canisters	5.0 Canisters	5.7 Canisters	4.8 Canisters
Average Number of Prescribed Short-Acting Beta-Agonist Canisters for Members With 12 or More Canisters	16.3 Canisters	16.7 Canisters	17.1 Canisters	16.0 Canisters	16.4 Canisters	16.3 Canisters

## Conclusions and Recommendations

The main findings from this focused study showed:

- ◆ Slightly more than 8 of every 10 Colorado Medicaid members with asthma 5 to 56 years of age (84.4 percent) had evidence of appropriate use of medication during FY 06–07. While this rate was 12.4 percentage points higher than the rate in FY 03–04 (72.0 percent), the Colorado Medicaid rate was slightly lower than the NCQA 2006 HEDIS national Medicaid 50th percentile of 87.1 percent. Children 5 to 9 years of age exhibited the highest rate (92.6 percent) followed by children 10 to 17 years of age and adults 18 to 56 years of age (86.7 percent and 76.5 percent, respectively). Some variation in performance was noted across the health plans and age groups.
- ◆ Among Colorado Medicaid members with persistent asthma, 12.4 percent exhibited overuse (i.e., 12 or more canisters) of inhaled, short-acting beta-agonists during FY 06–07. This rate suggests a small decrease in performance compared with the Colorado Medicaid rate in FY 03–04 (9.5 percent). Three Colorado Medicaid programs showed similar rates, ranging from 10.6 percent to 13.6 percent, while one health plan displayed a considerably higher rate of overuse (25.9 percent).
- ◆ The average Colorado Medicaid member with persistent asthma received 5.2 canisters of an inhaled, short-acting beta-agonist during the study period compared with 3.9 canisters in FY 03–04. While this represented an increase of approximately one canister per year, the overall use of short-acting beta-agonists was well below the threshold of 12 canisters per year. Further, the average number of canisters used by members prescribed 12 or more canisters was 16.3 canisters per year, or 2 canisters fewer than in FY 03–04. Individual Colorado Medicaid program rates ranged from 4.8 canisters to 9.0 canisters.
- ◆ In general, the results from the first two quality measures indicate that Colorado Medicaid members with asthma appear to be receiving appropriate asthma medications. However, for members who used more than 12 canisters of an inhaled, short-acting beta-agonist, the results suggest that more intense case management may be appropriate.

## Overall Recommendations

Based on the findings of this focused study, HSAG makes the following recommendations:

- ◆ HSAG recommends that future studies measure consistent use of inhaled corticosteroids, along with the current HEDIS asthma measures, as an appropriate use of asthma medication.
- ◆ The Department should work with the Colorado Medicaid programs to ensure that all providers understand national guidelines for appropriate asthma care. Additionally, ongoing communication designed to provide practitioners and their office staff with best practices may help to increase the provision of appropriate asthma care.
- ◆ 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 may be more likely to use less cost-effective resources such as the emergency department, urgent care, and inpatient services. Targeted interventions could then follow recommendations outlined in Healthy People 2010, including encouraging providers to establish an asthma action plan. The asthma action 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 the disease should be included in the plan.
- ◆ Colorado Medicaid programs should encourage providers to evaluate member compliance with prescribed medications at every office visit.

## References

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- <sup>1-1</sup> Colorado Hospital Association database. Available at: <http://www.chha.com/download/crpt05np.pdf>. Accessed on May 31, 2007.
- <sup>1-2</sup> American Lung Association, State of the Air: 2007. Available at: <http://lungaction.org/reports/stateoftheair2007.html>. Accessed on May 31, 2007.
- <sup>1-3</sup> Sears, M.R. ( May 2001). Deleterious Effects of Inhaled Beta-Agonists. *Chest*, 119.
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- <sup>1-5</sup> Reddy, P. Kelly, T.E. et al., (June 2001). Medicaid's  $\beta_2$ -Agonist Recipients and Their Treatment by National Standards. *The Annals of Pharmacotherapy*, 35.
- <sup>1-6</sup> National Institutes of Health (July 1997) . Guidelines for the Diagnosis and Management of Asthma. *National Asthma Education and Prevention Program Clinical Practice Guidelines Expert Panel Report 2*. NIH Publication, 97-4051.

### Introduction

Asthma is a chronic disease of the lungs, characterized by sudden, recurring attacks of difficult breathing, wheezing, and coughing. These attacks, usually triggered by allergens and irritants such as animals, dust, cigarette smoke, and fragrances, can range from mild to life threatening. This chronic disease has been on a steep rise since 1980 and is estimated to affect nearly 20 million Americans, including 6.3 million children.

The FY 06–07 Colorado Asthma Medication Management Focused Study was conducted for the Department by Colorado Medicaid’s external quality review organization, HSAG. This focused study evaluated the services received by Colorado Medicaid beneficiaries in four Colorado Medicaid programs who had been diagnosed with asthma, and assessed the use of appropriate medications for the treatment of asthma and the overuse of inhaled short-acting beta-agonists. The study will allow the Department and Colorado Medicaid programs to assess their rates compared with national statistics and monitor appropriate and inappropriate use of medications for the treatment of asthma.

### Background

Although asthma affects Americans of all ages, races, and ethnic groups, low-income and minority populations experience significantly higher rates of emergency room visits, hospital admissions, and death due to the disease. The Colorado Medicaid 2003–2004 Quality Strategy Work Plan identified asthma as one of the top diagnoses for the Medicaid managed care population. Asthma is the third-most-common inpatient diagnosis in the Colorado Medicaid managed care population, constituting 10.4 percent of total inpatient claims. It is also the fifth-most-common ambulatory diagnosis, constituting 9.3 percent of total ambulatory claims in the Medicaid managed care population.

The Centers for Disease Control and Prevention (CDC) estimates that asthma accounts for more than 14 million outpatient clinic visits and nearly 2 million emergency department visits each year. The CDC also identifies asthma as the most common serious chronic disease of childhood, accounting for one-third of all pediatric emergency room visits, and is the fourth-most-common cause of pediatric visits to the doctor’s office.<sup>2-1</sup>

According to the 2004 Behavioral Risk Factor Surveillance System report, the asthma prevalence rate self-reported by adults in Colorado was 8.7 percent of the population, compared with 7.7 percent in 2002. The rate for the U.S. population was 8.1 percent in 2004, up from 7.5 percent reported in 2002.<sup>2-2</sup>

As the prevalence of asthma continues to rise, the impact on health and the economy is substantial. Recent analysis of the economic impact of asthma, commissioned by the American Lung Association, cited annual estimated costs of \$16.1 billion in 2004. Prescription drugs represented the largest single direct medical expenditure, at \$5 billion.<sup>2-3</sup> Management of asthma is critical.

Neglect of the condition frequently results in hospitalization, emergency room (ER) visits, and missed work and school days.

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 received appropriate medication management. The asthma study assessed utilization of short-acting beta-agonists to complement the HEDIS asthma measure and allowed the Department and the Medicaid programs to monitor overuse of inhaled, short-acting beta-agonists, defined as 12 or more canisters per year.

Comparing the results of the FY 06–07 study with the results of the FY 03–04 study will help the Department and Colorado Medicaid programs assess the success of any intervention plans that may have been implemented since the last study. The study results can be used to help identify areas of increased, sustained, and needed improvement.

## References

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- <sup>2-1</sup> Asthma Fact Sheet as published by the Environmental Protection Agency. Available at: [http://www.epa.gov/asthma/pdfs/asthma\\_fact\\_sheet\\_en.pdf](http://www.epa.gov/asthma/pdfs/asthma_fact_sheet_en.pdf). Accessed on: February 13, 2007.
- <sup>2-2</sup> CDC, National Center for Health Statistics. *BRFSS 2004 Adult Asthma Data: Prevalence Tables And Maps, Table C-1*. Available at: <http://www.cdc.gov/asthma/brfss/04/current/current.pdf>. Accessed on: February 12, 2007.
- <sup>2-3</sup> American Lung Association Epidemiology & Statistics Unit Research and Program Services. *Trends in Asthma Morbidity and Mortality*, July 2006. Available at: <http://www.lungusa.org/atf/cf/{7A8D42C2-FCCA-4604-8ADE-7F5D5E762256}/ASTHMA06FINAL.PDF>. Accessed on: February 12, 2007.

## Overview

This focused study was the remeasurement of the baseline focused study conducted in FY 03–04 and included an assessment of the use of short-acting beta-agonists to complement the HEDIS asthma measure. This study will allow the Department and Colorado Medicaid programs to monitor use of inhaled, short-acting beta-agonists and the appropriate use of medications for the treatment of asthma, as defined by the HEDIS measure on asthma. When appropriate, comparisons were made to the original FY 03–04 Colorado Medicaid asthma baseline study. However, due to population changes in the distribution of members across Colorado Medicaid programs, caution should be used when interpreting differences in performance between study years.

The NCQA HEDIS measure, *Use of Appropriate Medications for People With Asthma*, was reported using the administrative method only. This measure evaluated whether members with persistent asthma were being prescribed medications acceptable as primary therapy for long-term control of asthma. In addition to the HEDIS measure, one important indicator of the inappropriate use of asthma medications was the overuse of short-acting beta-agonists. Children receiving six or more bronchodilators per year are five times more likely to be admitted to the hospital and three times more likely to visit the ER compared with those receiving one to three prescriptions. 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-agonists correlates with poor control of asthma and its consequences.<sup>3-1,2,3,4</sup> Studies suggest that the regular use of short-acting beta-agonists can lead to decreased lung function, increased airway responsiveness, and decreased asthma control.<sup>3-5</sup>

The asthma study focused on members enrolled in one of the following Colorado Medicaid programs: Primary Care Physician Program (PCPP), fee for service (FFS), Denver Health Medicaid Choice (DHMC), or Rocky Mountain Health Plan (RMHP). The study population was limited to beneficiaries between 5 and 56 years of age as of December 31, 2006, who were continuously enrolled and identified as having persistent asthma during 2005 and 2006. Optional exclusions were applied for emphysema and chronic obstructive pulmonary disease. Persistent asthma was defined in the *HEDIS 2007 Technical Specifications, Volume 2* by any of the following events (during 2005 and 2006):

- ◆ At least four asthma medication dispensing events.
- ◆ At least one emergency department visit with a primary diagnosis of asthma.
- ◆ At least one hospitalization with a primary diagnosis of asthma.
- ◆ 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 2007 Technical Specifications* for identifying members with asthma can be found in Appendix A.

## Measures

Two measures were evaluated and reported.

*Use of Appropriate Medications for People With Asthma* (HEDIS 2007) was calculated as the percentage of members in the study population who received at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines during FY 06–07. Results were evaluated and reported for ages 5 to 9, 10 to 17, and 18 to 56, as well as for the combined study population (5 to 56).

*Overuse of Inhaled, Short-Acting Beta-Agonists* was calculated as the percentage of members in the study population who received dispensed prescriptions for 12 or more canisters of inhaled, short-acting beta-agonists during FY 06–07. (Note: More than one canister may have been dispensed on any given date in FY 06–07 and all of them would have been counted for this measure.)

Only short-acting, beta-agonist-type inhalers were included for this numerator. The following were specifically excluded: long-acting beta-agonists, inhaled corticosteroids, inhaled anti-inflammatories, methylxanthines, nebulized medications, oral bronchodilators, leukotriene modifiers, and mast cell stabilizers. The list of medications for this numerator is provided as Attachment A. Results were evaluated and reported for ages 5 to 9, 10 to 17, 18 to 56, as well as for the combined study population (ages 5 to 56). Results were also reported by the number of canisters used.

## 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 the Department and determined the asthma population using the specified criteria.

HSAG examined administrative and pharmacy claims data provided by the Department, RMHP, and DHMC to evaluate use 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. In addition, providers dispensing sample medications would not submit encounter data. Since this focused study relied on encounter data, rates may actually be higher than what was reported in the Results section. The eligible population of members who had asthma was identified using the *HEDIS 2007 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 asthma severity level or health status of members. The level of severity or any comorbid conditions for members with asthma in the four different populations (i.e., DHMC, RMHP, PCPP, and FFS) was unknown. It was possible members in one health plan may have had more health-related issues (e.g., a higher percentage of smokers) or different levels of severity in their asthma and, therefore, required more intense treatment. This might have resulted in higher utilization of services. For example, members with a higher level of asthma severity may have used more inhaled, short-acting beta-agonists.

The HEDIS specifications changed from the baseline study performed in FY 03–04. Members in the FY 03–04 study only had to have persistent asthma during the measurement year. For the current study, members had to have had persistent asthma for the measurement year and the preceding year. This may have reduced the number of members entered into the study. The effects of this could not be determined in this study.

This focused study addressed members with persistent asthma who were enrolled in Colorado Medicaid. Results should not be extrapolated to the general asthma population.

## References

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- <sup>3-1</sup> Sears MR. Deleterious Effects of Inhaled Beta-Agonists. *Chest*. 2001;119.
- <sup>3-2</sup> Donahue JG, Fuhlbridge AL, et al. Asthma Pharmacotherapy and Utilization in Three Managed Care Organizations. *Journal of Allergies and Clinical Immunology*. 2002;109.
- <sup>3-3</sup> Reddy P, Kelly TE, et al. Medicaid's  $\beta$ 2-Agonist Recipients and Their Treatment by National Standards. *The Annals of Pharmacotherapy*. 2001;35.
- <sup>3-4</sup> National Institutes of Health. Guidelines for the Diagnosis and Management of Asthma. National Asthma Education and Prevention Program Clinical Practice Guidelines, Expert Panel Report 2. NIH Publication, 97-4051.
- <sup>3-5</sup> Donahue JG, Fuhlbridge AL, et al. Asthma Pharmacotherapy and Utilization in Three Managed Care Organizations. *Journal of Allergies and Clinical Immunology*. 2002;109.

## Study Population Characteristics

The age and gender distribution for the Colorado Medicaid programs—the health plans, the PCPP, and the FFS program—are presented in Table 4-1 below. The majority (38 percent) of eligible Colorado Medicaid members were in the 18-to-56-year-old age group, closely followed by the 10-to-17-year-old age group (36 percent). The 5-to-9-year-old age group had the least amount of members (26 percent). The majority (54 percent) of the members were female.

For the health plans and the PCPP, the majority of eligible members were in the 18-to-56-year-old age group, except for the FFS program, which had the majority of eligible members in the 10-to-17-year-old age group. Both the DHMC and RMHP populations had a higher percentage of members in the 18-to-56-year-old age group than the PCPP and FFS program. Both health plans, the PCPP, and the FFS program had a larger percentage of females than males. DHMC and RMHP showed a higher percentage of females than the PCPP and the FFS program.

Overall, the FFS population was the largest (1,309 members out of 2,246 total members in the study). The PCPP (625 cases) had the second-largest population, followed by RMHP (177 cases) and DHMC (135 cases). Because the FFS population accounted for 58.3 percent of the eligible population, compliance by FFS members influenced the overall Colorado Medicaid results.

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

Demographic	Colorado Medicaid		RMHP		DHMC		PCPP		FFS	
	N	%	N	%	N	%	N	%	N	%
Age										
5 to 9 Years	585	26.0%	39	22.0%	22	16.3%	154	24.6%	370	28.3%
10 to 17 Years	805	35.8%	39	22.0%	27	20.0%	205	32.8%	534	40.8%
18 to 56 years	856	38.1%	99	55.9%	86	63.7%	266	42.6%	405	30.9%
<b>Total 5 to 56 Years</b>	<b>2,246</b>	<b>100.0%</b>	<b>177</b>	<b>100.0%</b>	<b>135</b>	<b>100.0%</b>	<b>625</b>	<b>100.0%</b>	<b>1,309</b>	<b>100.0%</b>
Gender										
Male	1,033	46.0%	67	37.9%	48	35.6%	280	44.8%	638	48.7%
Female	1,213	54.0%	110	62.1%	87	64.4%	345	55.2%	671	51.3%

**Measure 1: Use of Appropriate Medications for People With Asthma**

The *Use of Appropriate Medications for People With Asthma—Ages 5 to 56 Years* calculates the percentage of members 5 to 56 years of age who had been continuously enrolled for the measurement year and the year prior to the measurement year and who were identified as having persistent asthma during the year prior to the measurement year. This measure evaluates whether members with persistent asthma are being prescribed medications acceptable as primary therapy for long-term control of asthma. The NCQA HEDIS 2006 national 50th percentile was used as a benchmark for this focused study.

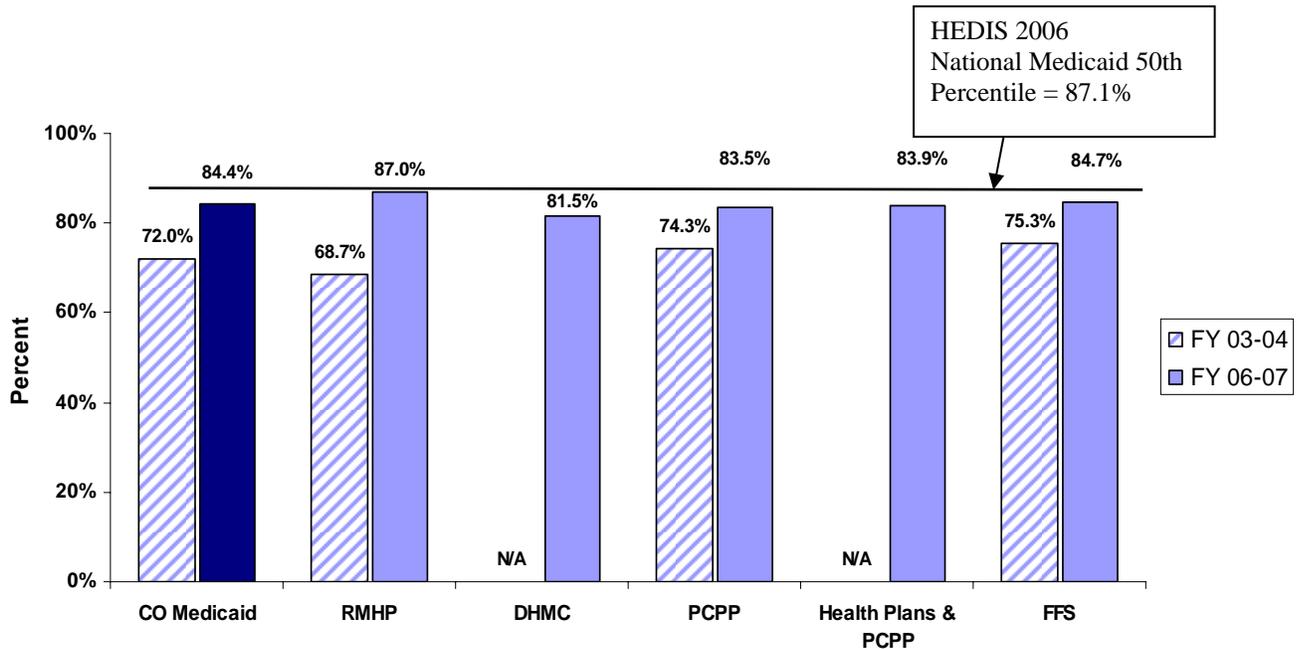
Table 4-2 shows the percentage of Medicaid members 5 to 56 years of age who received at least one dispensed prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines during FY 06–07.

Table 4-2—Use of Appropriate Medications for People With Asthma					
Age Group	Colorado Medicaid	NCQA HEDIS 2006 National Medicaid Percentiles			
		25th	50th	75th	90th
5 to 9 Years (N = 585)	92.6%	86.7%	90.2%	93.4%	95.8%
10 to 17 Years (N = 805)	86.7%	83.3%	87.4%	91.1%	93.5%
18 to 56 years (N=856)	76.5%	80.3%	84.9%	88.0%	90.8%
<b>Overall (5 to 56 Years, N = 2,246)</b>	<b>84.4%</b>	<b>84.0%</b>	<b>87.1%</b>	<b>89.7%</b>	<b>92.5%</b>

Overall, Colorado Medicaid, at 84.4 percent, was 2.7 percentage points below the Medicaid NCQA HEDIS 50th percentile. Only the 5-to-9-year-old age group had a rate (92.6 percent) that was above the Medicaid NCQA HEDIS 50th percentile. The rate for the 10-to-17-year-old age group (86.7 percent) was slightly below the 50th percentile, and the rate for the 18-to-56-year-old age group (76.5 percent) was 8.4 percentage points below the 50th percentile. The results indicate that focusing interventions on the 18-to-56-year-old age group will most likely yield the greatest improvement in the overall Colorado Medicaid rate.

Figure 4-1 illustrates program and year-to-year comparisons for the *Use of Appropriate Medications for People With Asthma* measure for the combined rate (5 to 56 years of age) for all health plans and the PCPP, including and excluding FFS.

**Figure 4-1—Use of Appropriate Medications for People With Asthma, 5 to 56 Years of Age**



NOTE: DHMC was not included in the original focused study in FY 03-04.

The eligible population in the FY 06–07 study ranged from 135 cases for DHMC to 1,309 cases for the FFS population. The total eligible Colorado Medicaid population consisted of 2,246 cases. The FFS population had the largest percentage of members, which influenced the overall Colorado Medicaid rate.

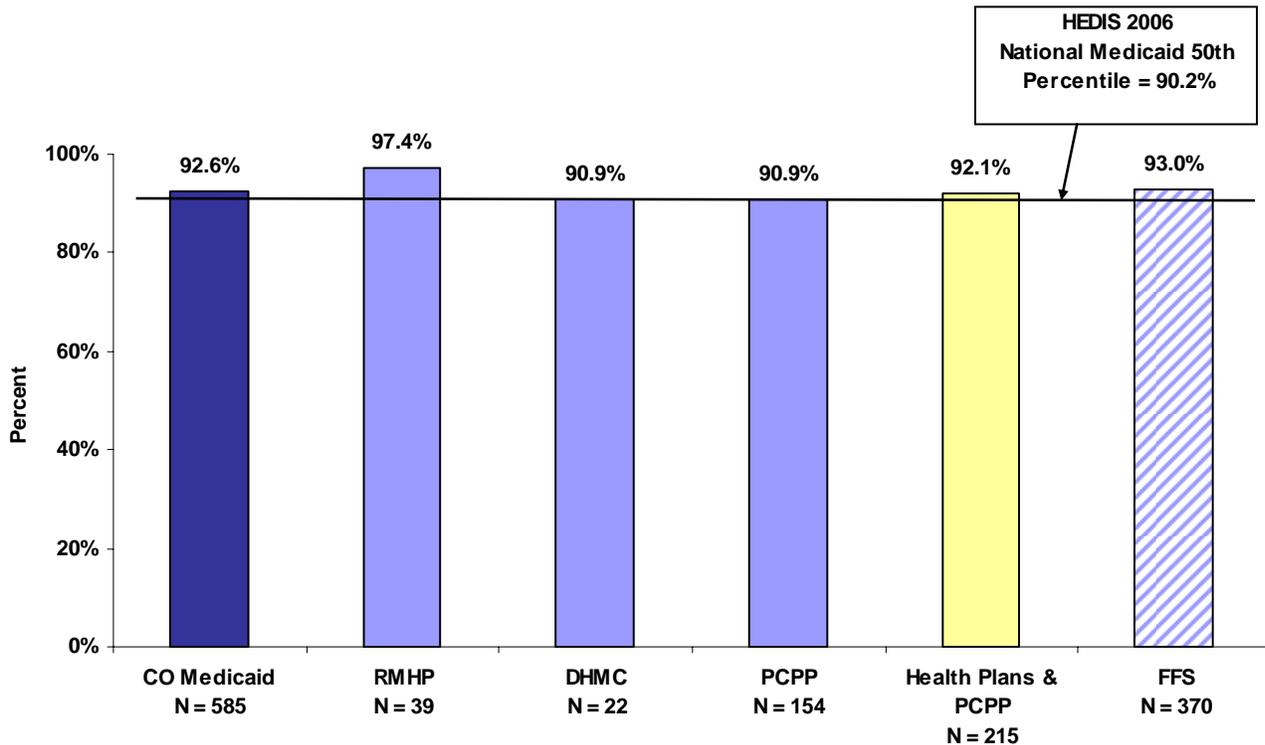
The overall Colorado Medicaid rate increased 12.4 percentage points from 72.0 percent in FY 03–04 to 84.4 percent in FY 06–07. Rates for RMHP, the PCPP and FFS all increased from their FY 03–04 baseline results, ranging from increases of 9.2 percentage points (PCPP) to 18.3 percentage points (RMHP). DHMC became a new managed care organization (MCO) in 2004 and, therefore, was unable to participate in the baseline focused study.

The overall Colorado Medicaid rate (84.4 percent) was slightly below the NCQA HEDIS 2006 national Medicaid 50th percentile of 87.1 percent. Nonetheless, the Colorado Medicaid rate indicates that 8 out of 10 asthmatics use appropriate medications.

RMHP’s rate was closest to the NCQA HEDIS 2006 national Medicaid 50th percentile, at 87.0 percent. DHMC recorded the lowest rate, at 81.5 percent. Rates for DHMC, the PCPP and FFS were similar, ranging from 81.5 percent to 84.7 percent. The combined rate for all health plans and the PCPP, excluding FFS, was 83.9 percent.

Figure 4-2 presents program comparisons for the *Use of Appropriate Medications for People With Asthma* measure for members 5 to 9 years of age for all health plans and the PCPP, including and excluding FFS.

**Figure 4-2—Use of Appropriate Medications for People With Asthma, 5 to 9 Years of Age**



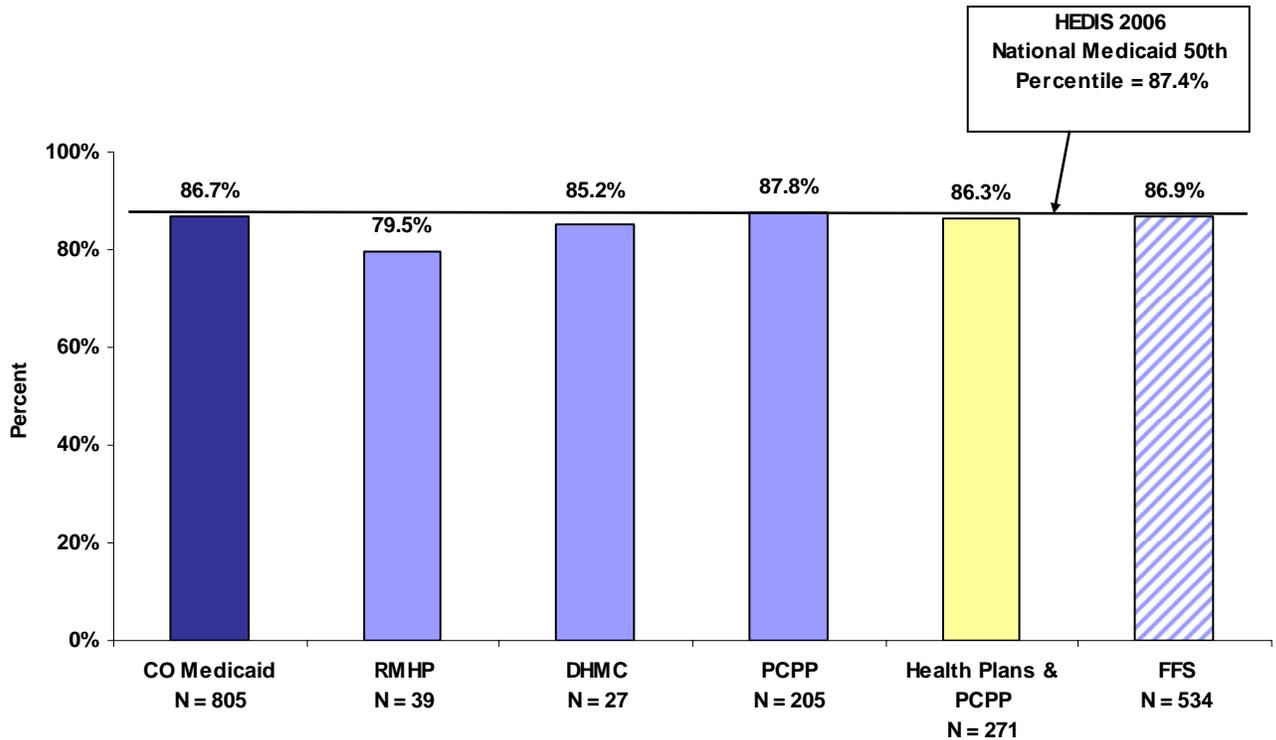
The eligible population shown in Figure 4-2 ranged from 22 cases for DHMC to 370 cases for the FFS population. The total eligible Colorado Medicaid population for the 5-to-9-year-old age group consisted of 585 cases. The FFS program, which had the largest proportion of members in its population, influenced the overall results for this age group.

The overall Colorado Medicaid rate for the 5-to-9-year-old age group was 92.6 percent, or 2.4 percentage points higher than the NCQA HEDIS 2006 national Medicaid 50th percentile of 90.2 percent. This may be due to the age group’s contact with the Colorado Medicaid program through other recommended services, such as well-child visits, as well as parental control.

The rates ranged from 97.4 percent (RMHP) to 90.9 percent (DHMC and the PCPP). All programs were above the NCQA HEDIS 2006 national Medicaid 50th percentile of 90.2 percent. Rates for RMHP and FFS were higher than rates for the PCPP and DMHC, which were the same. The combined rate for all health plans and the PCPP, excluding FFS, was 92.1 percent.

Figure 4-3 presents program comparisons for the *Use of Appropriate Medications for People With Asthma* measure for members 10 to 17 years of age for all health plans and the PCPP, including and excluding FFS.

**Figure 4-3—Use of Appropriate Medications for People With Asthma, 10 to 17 Years of Age**



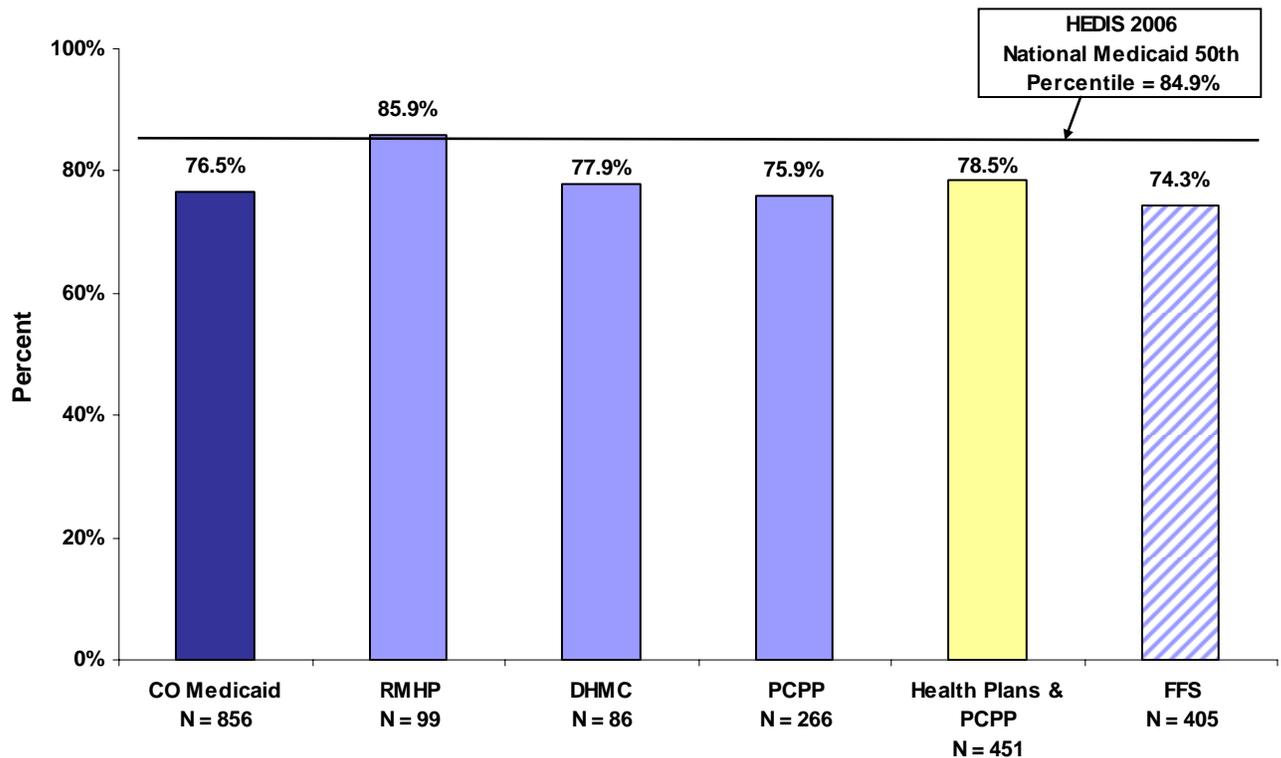
The eligible population shown in Figure 4-3 ranged from 27 cases for DHMC to 534 cases for the FFS population. The total eligible Colorado Medicaid population for the 10-to-17-year-old age group consisted of 805 cases. With 66.3 percent of Colorado Medicaid members, the FFS program had the greatest influence on rates for the 10-to-17-year-old age group.

The overall Colorado Medicaid rate for the 10-to-17-year-old age group was 86.7 percent, almost equaling the NCQA HEDIS 2006 national Medicaid 50th percentile of 87.4 percent. This may be due to the group’s contact with the Colorado Medicaid program through other recommended services such as well-child visits.

All of the individual program rates were below the HEDIS 2006 national Medicaid 50th percentile, except for the PCPP, at 87.8 percent. Compliance ranged from 87.8 percent (the PCPP) to 79.5 percent (RMHP). Rates for DHMC (85.2 percent), the PCPP, and FFS (86.9 percent) were similar. The rates for RMHP and DHMC were slightly below the rates for the PCPP and FFS. The combined rate for all health plans and the PCPP, excluding FFS, was 86.3 percent.

Figure 4-4 presents program comparisons for the *Use of Appropriate Medications for People With Asthma* measure for members 18 to 56 years of age for all health plans and the PCPP, including and excluding FFS.

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



The eligible population shown in Figure 4-4 ranged from 86 cases for DHMC to 405 cases for the FFS population. The total eligible Colorado Medicaid population for the 18-to-56-year-old age group consisted of 856 cases. The FFS program, with 47.3 percent of the members, influenced the overall results for the 18-to-56-year-old age group.

The overall Colorado Medicaid rate for the 18-to-56-year-old age group was 76.5 percent, or 8.4 percentage points lower than the NCQA HEDIS 2006 national Medicaid 50th percentile of 84.9 percent. This result indicates an opportunity to focus interventions on this age group.

The individual program rates ranged from 6 to more than 10 percentage points below the HEDIS 2006 national Medicaid 50th percentile, except for RMHP, which exceeded the 50th percentile by 1 percentage point. FFS had the lowest rate, at 74.3 percent, followed by the PCPP, at 75.9 percent, and DHMC, at 77.9 percent. The combined rate for all health plans and the PCPP, excluding FFS, was 78.5 percent. The results indicate that all programs except RMHP have an opportunity to increase the use of appropriate medications for asthmatics in the 18-to-56-year-old age group.

## Measure 2: Use of Short-Acting Beta-Agonists

Short-acting beta-agonists remain the most effective treatment of choice for relieving acute asthma episodes. Daily use is generally not recommended. In fact, regular use may produce a reduction in the member’s asthma control and lung function. This measure examines poor utilization; therefore, low rates should be considered better than high rates. There is no national benchmark available for this measure.

Table 4-3 below displays the frequency of the most commonly prescribed inhaled, short-acting beta-agonists among Colorado Medicaid members who are persistent asthmatics. Using one or more canisters per month (or more than 12 per year) of inhaled, short-acting beta-agonists correlates with poor control of asthma.

The average number of canisters used by Colorado Medicaid members increased by approximated 1 canister from FY 03–04 to FY 06–07. RMHP, the PCPP, and FFS all increased from their FY 03–04 baseline results, ranging from an increase of 1.7 canisters for the PCPP to 2.4 canisters for RMHP. DHMC became a new MCO in 2004 and, therefore, was unable to participate in the baseline focused study.

The average Colorado Medicaid member with persistent asthma received 5.2 canisters per year. This number was well below the threshold of 12 canisters per year. For members who received 12 or more canisters during the year, each member received 16.3 canisters per year on average, or about 2.7 canisters every two months. The average number of canisters used by members prescribed more than 12 canisters per year for all health plans and the PCPP, excluding FFS, was 16.4.

The FFS program had the lowest use of canisters per year, at 4.8, while DHMC had the highest, at 9.0 canisters per year. RMHP averaged 6.2 canisters per year while the PCPP program averaged 5.0 canisters per year. The average number of canisters used per year for all health plans and the PCPP, excluding FFS, was 5.7.

For members averaging more than 12 canisters per year, DHMC had the highest use, at 17.1, with the other programs averaging between 16.0 and 16.7 canisters per year.

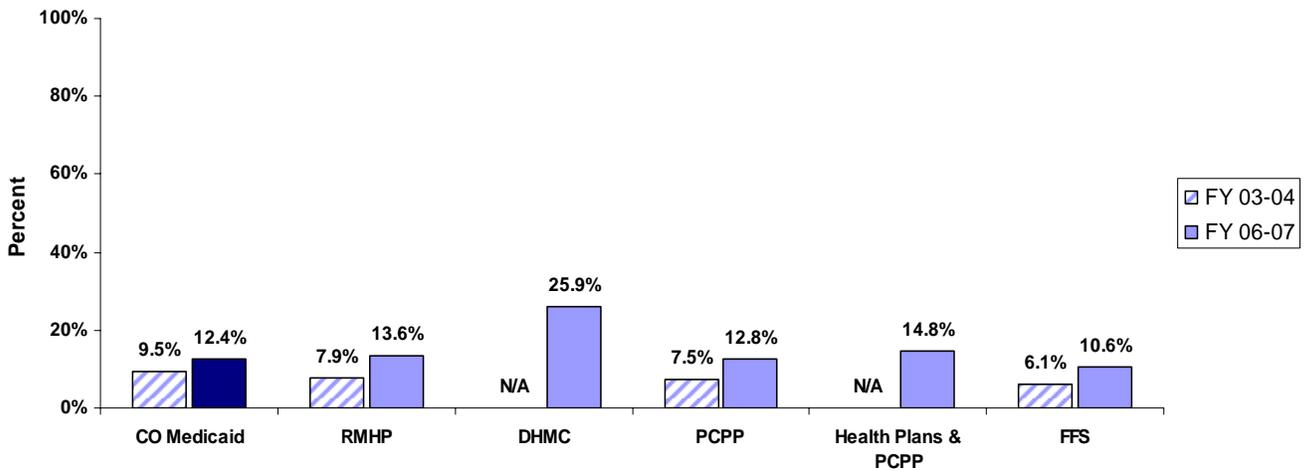
The results indicate that the majority of members with asthma appear to be using short-acting beta-agonists appropriately, as defined by this focused study. However, for members who used more than 12 canisters per year, the results indicate that these members may need intense case management.

**Table 4-3—Average Number of Prescribed Short-Acting Beta-Agonists**

	Measurement Year	Colorado Medicaid	RMHP	DHMC	PCPP	Health Plans and PCPP	FFS
Average Number of Prescribed Short-Acting Beta-Agonist Canisters for All Members With Asthma	FY 03–04	3.9 Canisters	3.8 Canisters	N/A	3.3 Canisters	N/A	3.0 Canisters
	FY 06–07	5.2 Canisters	6.2 Canisters	9.0 Canisters	5.0 Canisters	5.7 Canisters	4.8 Canisters
Average Number of Prescribed Short-Acting Beta-Agonist Canisters for Members With 12 or More Canisters	FY 03–04	18.3 Canisters	17.3 Canisters	N/A	18.1 Canisters	N/A	17.2 Canisters
	FY 06–07	16.3 Canisters	16.7 Canisters	17.1 Canisters	16.0 Canisters	16.4 Canisters	16.3 Canisters

Figure 4-5 shows the percentage of asthmatics using 12 or more canisters of short-acting beta-agonists per year. A lower percentage equates to better control of asthma. Program comparisons are presented for *Overuse of Inhaled, Short-Acting Beta-Agonists* for the combined rate (5 to 56 years of age) for all health plans and the PCPP, including and excluding FFS.

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



NOTE: DHMC was not included in the original focused study in FY 03-04.

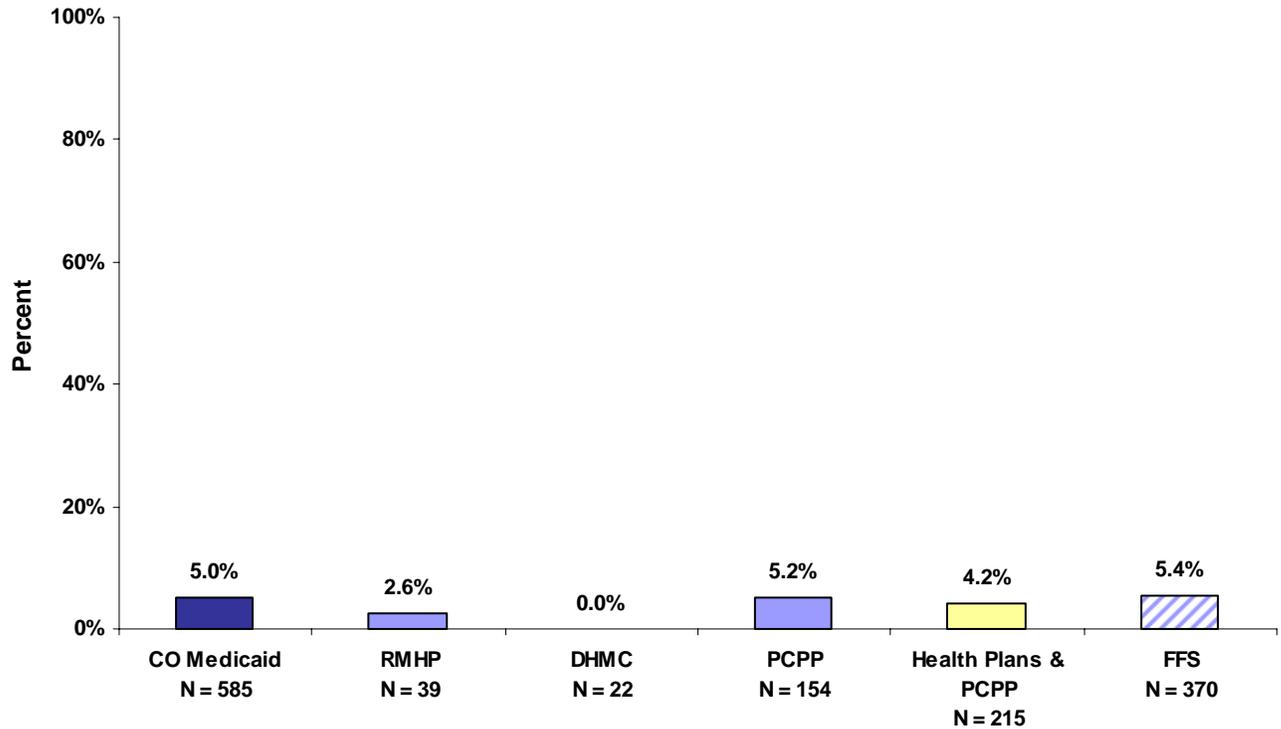
The eligible population in the FY 06–07 study ranged from 135 cases for DHMC to 1,309 cases for the FFS population. The total eligible Colorado Medicaid population consisted of 2,246 cases. The FFS population had the largest percentage of members, which influenced the overall Colorado Medicaid rate.

The percentage of asthmatics using more than 12 canisters per year for the overall Colorado Medicaid program increased approximately 2.9 percentage points from FY 03–04 to FY 06–07. RMHP, the PCPP, and FFS all increased from their FY 03–04 baseline results, ranging from an increase of 4.5 percentage points for FFS to 5.7 percentage points for RMHP. DHMC became a new MCO in 2004 and, therefore, was unable to participate in the baseline focused study.

The overall Colorado Medicaid rate for this measure was 12.4 percent. The program rates ranged from 10.6 percent for the FFS population to 25.9 percent for DHMC. Except for DHMC, the program rates were similar. The rate for all health plans and the PCPP, excluding FFS, was 14.8 percent. The FFS rate influenced the Colorado Medicaid rate, which was lower than the health plans’ and the PCPP rate. Lower rates for this measure are linked with a higher rate for *Use of Appropriate Medications for People With Asthma*.

Figure 4-6 presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 5 to 9 years of age for all health plans and the PCPP, including and excluding FFS.

**Figure 4-6—Overuse of Inhaled, Short-Acting Beta-Agonists, 5 to 9 Years of Age**

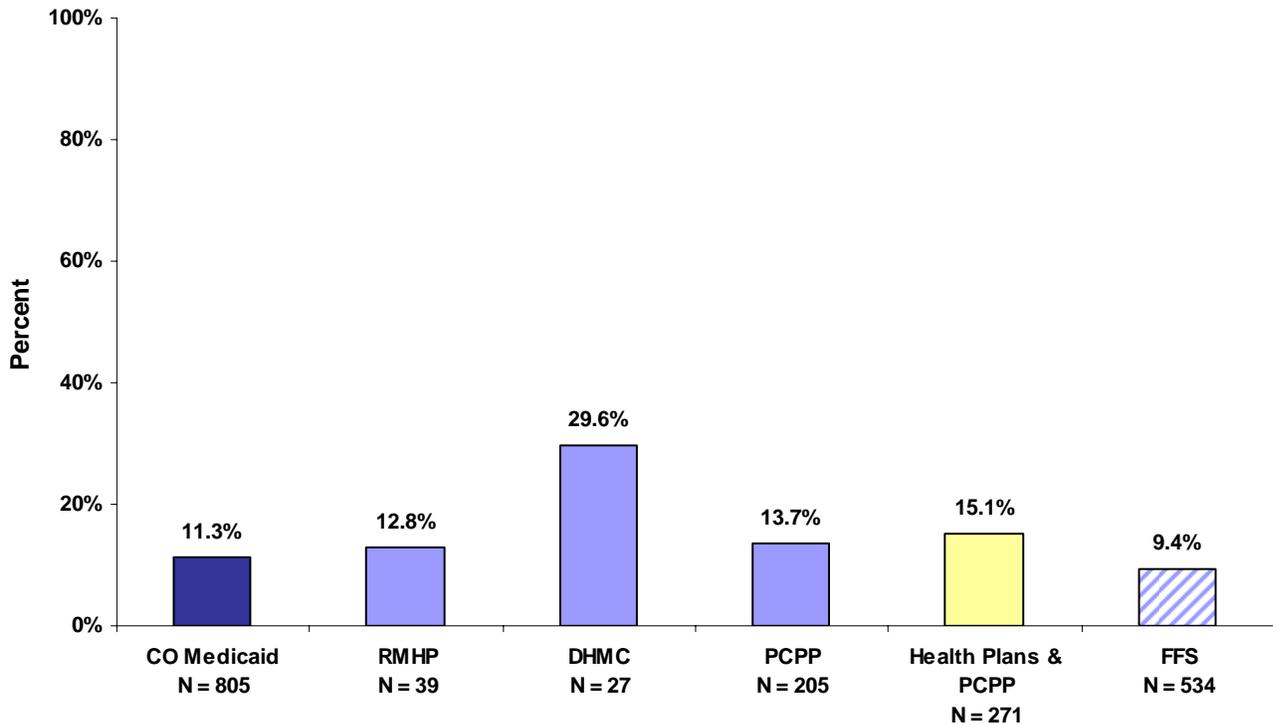


The eligible population is shown in Figure 4-6 and ranged from 22 cases for DHMC to 370 cases for the FFS population. The total eligible Colorado Medicaid population for the 5-to-9-year-old age group consisted of 585 cases. The FFS population, which had the largest proportion of members, influenced the results for this age group.

For the 5-to-9-year-old age group, the Colorado Medicaid rate was 5.0 percent. The health plan rates ranged from 0.0 percent for the DHMC population to 5.4 percent for the FFS program. The rate for both FFS and the PCPP were greater than the rates for RMHP and DHMC. The rate for all health plans and the PCPP, excluding FFS, was 4.2 percent. DHMC has achieved excellent results for this age group, which could be used to identify best practices.

Figure 4-7 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 10 to 17 years of age for all health plans and the PCPP, including and excluding FFS.

**Figure 4-7—Overuse of Inhaled, Short-Acting Beta-Agonists, 10 to 17 Years of Age**

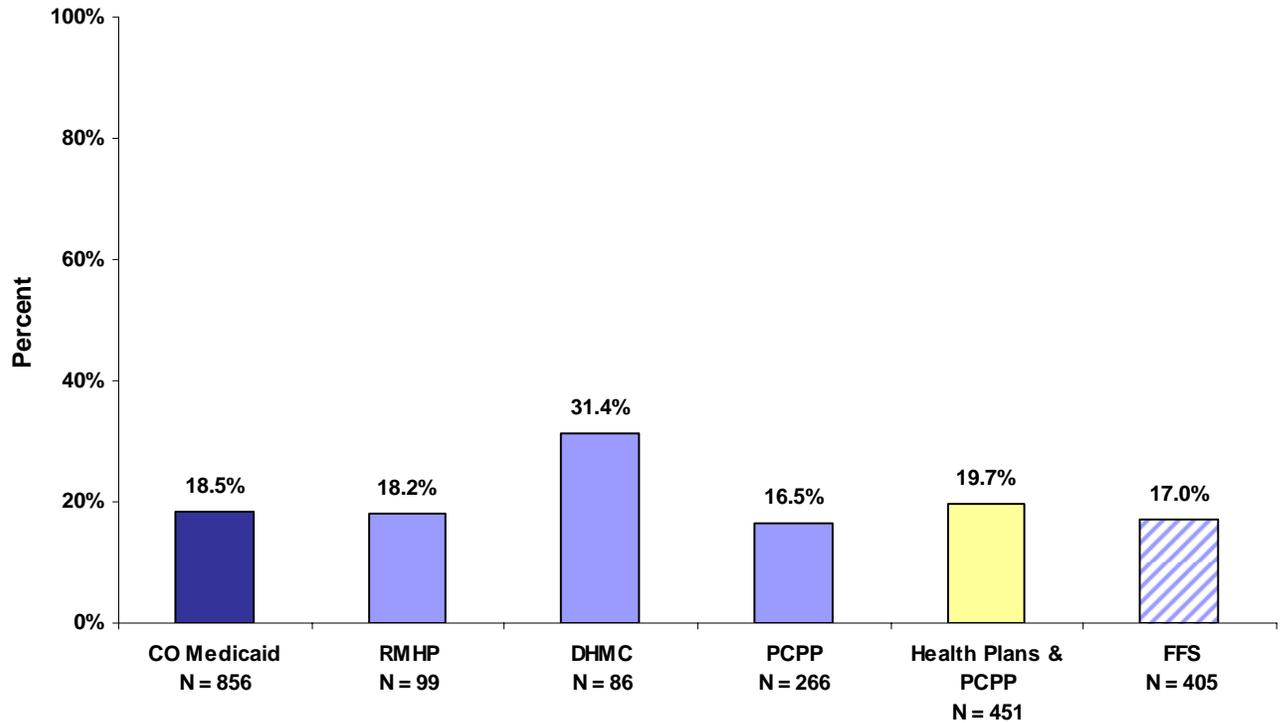


The eligible population is shown in Figure 4-7 and ranged from 27 cases for DHMC to 534 cases for the FFS population. The total eligible Colorado Medicaid population for the 10-to-17-year-old age group consisted of 805 cases. With 66.3 percent of members in its population, the FFS program had the greatest influence on rates for the Colorado Medicaid 10-to-17-year-old age group.

The Colorado Medicaid rate was 11.3 percent for the 10-to-17-year-old age group. The rate was more than twice the percentage of members in the 5-to-9-year-old age group overusing short-acting beta-agonists. The health plan rates ranged from 9.4 percent for the FFS population to 29.6 percent for DHMC, with similar rates for RMHP and PCPP. Compared with rates for the 5-to-9-year-old age group, rates for the 10-to-17-year-old age group were at least twice as high across all Colorado Medicaid programs. DHMC has an opportunity to decrease overuse of short-acting beta-agonists by focusing interventions on the 10-to-17-year-old age group. The rate for all health plans and the PCPP, excluding FFS, was 15.1 percent, which reflects the influence of the FFS program the Colorado Medicaid rate.

Figure 4-8 below presents program comparisons for *Overuse of Inhaled, Short-Acting Beta-Agonists* for members 18 to 56 years of age for all health plans and the PCPP, including and excluding FFS.

**Figure 4-8—Use of Inhaled, Short-Acting Beta-Agonists, 18 to 56 Years of Age**



The eligible population is shown in Figure 4-8 and ranged from 86 cases for DHMC to 405 cases for the FFS population. The total eligible Colorado Medicaid population for the 18-to-56-year-old age group consisted of 856 cases. With 47.3 percent of members in its population, the FFS program influenced rates for the Colorado Medicaid 18-to-56-year-old age group.

The Colorado Medicaid rate for members 18 to 56 years of age was 18.5 percent. The rate was 7.2 percentage points more than the rate for the 10-to-17-year-old age group and 13.5 percentage points more than the rate for the 5-to-9-year-old age group. The health plan rates ranged from 16.5 percent for the PCPP population to 31.4 percent for DHMC. Rates for RMHP, the PCPP and FFS were similar, while DHMC's rate was almost double the rates for these programs. Similar to the 10-to-17-year-old age group, DHMC has an opportunity to focus on the 18-to-56-year-old age group to decrease the number of asthmatics overusing short-acting beta-agonists. The rate for all health plans and the PCPP, excluding FFS, was 19.7 percent. The health plan rates for this age group were generally higher than the other two age groups. This may indicate an increased need for asthma education among the adult population.

## 5. Overall Medicaid Conclusions and Recommendations

### Introduction

This FY 06–07 asthma focused study was built on the findings of the FY 03–04 study by reporting asthma care. The study included the PCPP, the unassigned FFS program, a Medicaid MCO (DHMC), and a prepaid inpatient health plan (RMHP).

### Overall Conclusions

The main findings from this focused study showed:

- ◆ Slightly more than 8 of every 10 Colorado Medicaid members with asthma 5 to 56 years of age (84.4 percent) had evidence of appropriate use of medication during FY 06–07. While this rate was 12.4 percentage points higher than the rate in FY 03–04 (72.0 percent), the Colorado Medicaid rate was slightly lower than the NCQA 2006 HEDIS national Medicaid 50th percentile of 87.1 percent. Children 5 to 9 years of age exhibited the highest rate (92.6 percent) followed by children 10 to 17 years of age and adults 18 to 56 years of age (86.7 percent and 76.5 percent, respectively). Some variation in performance was noted across health plans and age groups.
- ◆ Among Colorado Medicaid members with persistent asthma, 12.4 percent exhibited overuse (i.e., 12 or more canisters) of inhaled, short-acting beta-agonists during FY 06–07. This rate suggests a small decrease in performance compared with the Colorado Medicaid rate in FY 03–04 (9.5 percent). Three Colorado Medicaid programs showed similar rates, ranging from 10.6 percent to 13.6 percent, while one health plan displayed a considerably higher rate of overuse (25.9 percent).
- ◆ The average Colorado Medicaid member with persistent asthma received 5.2 canisters of an inhaled, short-acting beta-agonist during the study period compared with 3.9 canisters in FY 03–04. While this increase represented an increase of approximately one canister per year, the overall use of short-acting beta-agonists was well below the threshold of 12 canisters per year. Further, the average number of canisters used by members prescribed 12 or more canisters was 16.3 canisters per year, or 2 canisters fewer than in FY 03–04. Individual Colorado Medicaid program rates ranged from 4.8 canisters to 9.0 canisters.
- ◆ In general, the results from the first two quality measures indicate that Colorado Medicaid members with asthma appear to be receiving appropriate asthma medications. However, for members who used more than 12 canisters of an inhaled, short-acting beta-agonist, the results suggest that more intense case management may be appropriate.

## Overall Recommendations

Based on the findings of this focused study, HSAG makes the following recommendations:

- ◆ HSAG recommends that future studies measure consistent use of inhaled corticosteroids, along with the current HEDIS asthma measures, as an appropriate use of asthma medication.
- ◆ The Department should work with the Colorado Medicaid programs to ensure that all providers understand national guidelines for appropriate asthma care. Additionally, ongoing communication designed to provide practitioners and their office staff with best practices may help to increase the provision of appropriate asthma care.
- ◆ 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 may be more likely to use less cost-effective resources such as the emergency department, urgent care, and inpatient services. Targeted interventions could then follow recommendations outlined in Healthy People 2010, including encouraging providers to establish an asthma action plan. The asthma action 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 the disease should be included in the plan.
- ◆ Colorado Medicaid programs should encourage providers to evaluate member compliance with prescribed medications at every office visit.

## HEDIS 2007 Technical Specifications, Volume 2

For the *Relative Resource Use for People With Asthma* measure, comorbidity is defined as outlined in the *HEDIS 2007 Technical Specifications, Volume 2*. The derivation of each comorbidity is presented below.

### Cardiovascular Conditions

Identify members for cardiovascular condition comorbidity in one of two ways: event or diagnosis occurring during the measurement year or the year prior to the measurement year. The MCO must use both criteria to identify comorbidity status.

- ◆ *Event*. Discharged alive for AMI, CABG or PTCA. Use the codes listed in Table A-1 below to identify AMI, PTCA, and CABG. AMI and CABG cases should be from inpatient claims only. All cases of PTCA should be included, regardless of setting (e.g., inpatient, outpatient, emergency room).

Table A-1—CMC-A: Codes to Identify AMI, PTCA, and CABG					
Description	CPT	HCPCS	ICD-9-CM Diagnosis	ICD-9-CM Procedure	DRG
AMI (inpatient only)			410.x1		121, 122, 516
PTCA	33140, 92980-92982, 92984, 92995, 92996			00.66, 36.01, 36.02, 36.05, 36.06, 36.07, 36.09	516, 517, 526, 527, 555-558
CABG (inpatient only)	33510-33514, 33516-33519, 33521-33523, 33533-33536, 35600, 33572	S2205-S2209		36.1, 36.2	106, 107, 109, 547-550

- ◆ *Diagnosis.* At least one outpatient, nonacute inpatient, acute inpatient or emergency department (ED) visit with any diagnosis of IVD. Use the codes in Table A-2 to identify an IVD diagnosis and Table A-3 to identify the visit type.

Table A-2—RDI-G: Codes to Identify IVD		
Description	ICD-9-CM Diagnosis	DRG
IVD	411, 413, 414.0, 414.8, 414.9, 429.2, 433-435, 440.1, 440.2, 444, 445	140, 524, 559

Table A-3—RDI-E: Codes to Identify Inpatient or Outpatient Care Using Claim/Encounter Data		
Description	CPT	UB-92 Revenue
Outpatient	92002, 92004, 92012, 92014, 98925-98929, 98940-98942, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99381-99387, 99391-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456, 99499	051x, 052-0523x, 0526-0529, 057x-059x, 077x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient	99301-99313, 99315, 99316, 99318, 99321-99328, 99331-99337	0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient	99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99261-99263, 99291	010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x-022x, 072x, 080x, 0987
Emergency department	99281-99285	045x, 0981

## Diabetes

Two methods are provided to identify diabetic members:

1. Pharmacy data
2. Claim/encounter data

The MCO must use both methods to identify a member as diabetic; however, a member only needs to be identified in one method to be included in the comorbid category. Members may be identified as having diabetes during the measurement year or the year prior to the measurement year.

- ◆ *Pharmacy data.* Members who were dispensed insulin or oral hypoglycemics/antihyperglycemics during the measurement year or the year prior to the measurement year on an ambulatory basis. Refer to Table A-4.

Table A-4—CDC-A: Prescriptions to Identify Diabetics				
Description	Prescriptions			
Insulin	Mix 50/50	Humalog	Levemir (detemir)	Novolog
	Mix 70/30	Humulin	Lantus (glargine)	Penfill
	Mix 75/25	Iletin	Lispro	Semilente
	Apidra (glulisine)	Insulin pen	Multiple daily	Ultralente
	Continuous	Insulin pump	injections	Velosulin
	subcutaneous	Regular insulin	Novolin	
	infusion of insulin	NPH Lente		
Exubera				
Oral hypoglycemic/ antihyperglycemic	Acetohexamide	Diabeta	Glynase Glyset	Precose
	Actos ActosPlus	Diabinese	Metaglip	(Acarbose)
	Met Amaryl	Dymelor	(Glipzide-	Rezulin
	Avandamet	Glimepiride	Metformin)	Rosiglitazone
	(Metformin-	Glipzide	Micronase	Starlix Tolazamide
	Rosiglitazone)	Glipzide XL	Miglitol	Tolamide
	Avandaryl	Glucamide	Nateglinide	Tolbutamide
	(Glimepiride-	Glucotrol	Orinase Orimide	Tolinase
	Rosiglitazone)	Glucotrol XL	Pioglitazone	Troglitazone
	Avandia	Glucovance	Prandin	
	Byetta (Exenatide)—	(Glyburide-	(Repaglinide)	
	Oral	Metformin)		
	Chlorpropamide	Glyburide		

- ◆ *Claim/encounter data.* Members who had two face-to-face encounters with different dates of service in an ambulatory setting or nonacute inpatient setting, or one face-to-face encounter in an acute inpatient or emergency room setting during the measurement year or the year prior to the measurement year with a diagnosis of diabetes. The MCO may count services that occur over both years. Use the codes in Table A-5 and Table A-6 to identify ambulatory or nonacute inpatient and acute inpatient or ED encounters.

Table A-5—CDC-B: Codes to Identify Diabetes		
Description	ICD-9-CM Diagnosis	DRG
Diabetes	250, 357.2, 362.0, 366.41, 648.0	294, 295

Table A-6—CDC-C: Codes to Identify Visit Type		
Description	CPT	UB-92 Revenue
Outpatient	92002-92014, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99384-99387, 99394-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456, 99499	051x, 052x, 0520-0523, 0526-0529, 057x-059x, 077x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient	99301-99313, 99315, 99316, 99318, 99321-99328, 99331-99337	0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient	99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99261-99263, 99291	010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x-022x, 072x, 080x, 0987
Emergency department	99281-99285	045x, 0981

### Major Depression

Identify all eligible members who, during the measurement year or the year prior to the measurement year, had any of the following:

- ◆ At least one principal diagnosis of major depression (refer to Table A-7) in any setting (e.g., outpatient visits, emergency room visits, inpatient discharges, or partial hospitalizations)
- ◆ At least two secondary diagnoses of major depression (refer to Table A-7) on different dates of service in any outpatient setting (e.g., outpatient or emergency room visits)
- ◆ At least one secondary diagnosis of major depression (refer to Table A-7) associated with any inpatient discharge

**Note:** Lab claims should not be included in the identification of members with depression.

Table A-7—AMM-A: Codes to Identify Major Depression		
Description	ICD-9-CM Diagnosis	DRG
Major depression*	296.2, 296.3, 298.0, 300.4, 309.1, 311	426**
Prior depressive episodes	296.2-296.9, 298.0, 300.4, 309.0, 309.1, 309.28, 311	426**

\* Brief depressive reaction (309.0) is not used for diagnosis since it includes grief reaction (believed to be the most common use of that code). Additionally, other possible codes that could indicate depression diagnosis (296.4–296.9, 309.0, 309.28) are not included in this list because these codes are less specific in identifying eligible members.

\*\* The MCO must *exclude* members with this code if the principal diagnosis is ICD-9-CM Code 301.12.

### Chronic Obstructive Pulmonary Disease (COPD)

Identify all eligible members who, during the measurement year or the year prior to the measurement year, had at least two diagnoses of COPD in any setting. Use Table A-8 to identify COPD.

Table A-8—SPR-A: Codes to Identify COPD	
Description	ICD-9-CM Diagnosis
Chronic bronchitis	491
Emphysema	492
COPD	496

### Hypertension

Identify eligible members with hypertension. A member is considered hypertensive if there are at least two outpatient encounters (Table A-9) on different dates of service during the measurement year or the year prior to the measurement year with a diagnosis of hypertension (Table A-9). Codes in Table A-9 must occur in conjunction with codes in Table A-10.

Table A-9—RDI-H: Code to Identify Hypertension	
Description	ICD-9-CM Diagnosis
Hypertension	401

Table A-10—RDI-I: Codes to Identify Outpatient Visits	
Description	CPT
Office or other outpatient services	99201-99205, 99211-99215, 99241-99245, 99384-99387, 99394-99397

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

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

NDC Code	Brand Name	Generic Drug Name	Therapeutic Category
00047299711	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00085061510	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00364263217	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00364263298	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00403177118	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
00403225118	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
00472126478	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
00536041612	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00536041613	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00536121612	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00536121613	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00603100475	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00603100499	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00677154970	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00677154971	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00781750287	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00781750288	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
00904287534	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/DOSE	short-acting beta agonists
00904287557	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/DOSE	short-acting beta agonists
00904507868	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
52493084701	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
52493084717	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
52555059417	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
52555059418	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
52959112100	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
52959129301	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
52959142103	Albuterol	Albuterol Inhal Aerosol 90 MCG/ACT	short-acting beta agonists

NDC Code	Brand Name	Generic Drug Name	Therapeutic Category
53002090264	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
53002090265	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
54569100800	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
54569101100	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
54569462100	Albuterol 6.7	Albuterol Sulfate Inhal Aero 120 MCG/ACT (100MCG Base Equiv)	short-acting beta agonists
54977069501	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
54977070601	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
55045148605	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
55175256801	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
55175257201	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
55175257501	Albuterol	Albuterol Inhal Aerosol 90 MCG/ACT	short-acting beta agonists
55953005101	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
55953005153	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
57362011601	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
58016605901	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
58016605917	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
58016620501	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting beta agonists
58016631617	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
59723012201	Albuterol	Albuterol 90 mcg/inh inhalation	short-acting beta agonists
60346033176	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
60346038476	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
60346039476	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
60346040876	Albuterol	ALBUTEROL INHAL AEROSOL 90 MCG/ACT	short-acting beta agonists
00085113202	Albuterol 6.7	albuterol sulfate 108 mcg/inh inhalation aerosol with adapter	short-acting beta agonists
00172439018	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00172439019	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00247034817	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists

<b>NDC Code</b>	<b>Brand Name</b>	<b>Generic Drug Name</b>	<b>Therapeutic Category</b>
00472126463	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00839760807	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00839760880	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00904507834	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00904507934	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
17270072101	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
49502030317	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
49502030327	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
49502033317	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
49502033327	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
50111080131	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
50111080132	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
52959009403	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54569424500	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54868370900	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
54868373900	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
57866005101	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
58016656901	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
59772617501	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
59772617502	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
59930156001	Albuterol	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
59930156002	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
62037079444	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
63874074917	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
66267099517	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
68115099517	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
59310057920	Albuterol HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists

NDC Code	Brand Name	Generic Drug Name	Therapeutic Category
59310017920	Albuterol HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
58980010817	Albuterol	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00089079021	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
54569225300	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
54569461500	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00089081521	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00089081710	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
54868282101	Maxair	pirbuterol 0.2 mg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
52493086926	Maxair	PIRBUTEROL INHAL AEROSOL 200 MCG	short-acting beta agonists
55175520501	Maxair	Pirbuterol Acetate Breath Activated Inhal Aerosol 200MCG/INH	short-acting beta agonists
60346020797	Maxair	PIRBUTEROL INHAL AEROSOL 200 MCG	short-acting beta agonists
00085061402	Proventil	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00085061403	Proventil	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00247008417	Proventil	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00247008486	Proventil	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
52959029300	Proventil	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54569005200	Proventil	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54868104101	Proventil	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00085113201	Proventil HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
52959056901	Proventil HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00173032188	Ventolin	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00173032198	Ventolin	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
00173046300	Ventolin	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
52959058801	Ventolin	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54569100300	Ventolin	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
54868073001	Ventolin	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists
54868190300	Ventolin	albuterol 90 mcg/inh inhalation aerosol	short-acting, inhaled beta-2 agonists

<b>NDC Code</b>	<b>Brand Name</b>	<b>Generic Drug Name</b>	<b>Therapeutic Category</b>
58016609901	Ventolin	albuterol 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00173068200	Ventolin HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
00173068220	Ventolin HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
68115076917	Ventolin HFA	albuterol CFC free 90 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists
63402051001	Xopenex HFA	levalbuterol CFC free 45 mcg/inh inhalation aerosol with adapter	short-acting, inhaled beta-2 agonists