

## STATISTICAL BRIEF #378

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### **Asthma Medication Use among Adults with Reported Treatment for Asthma, United States, 1998-1999 and 2008-2009**

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#### **Introduction**

Asthma is a chronic respiratory disease in which the lungs become inflamed and constricted. Between 1998-1999 and 2008-2009, the number of adults who reported treatment for asthma almost doubled from 5.5 million (2.7 percent of those age 18 and older) in 1998-1999 to 10.3 million (4.5 percent) in 2008-2009. Appropriate medications are essential for the adequate management of the disease. Treatment guidelines recommend the use of relievers, as required, to treat intermittent asthma, and the use of relievers in conjunction with controllers to treat persistent asthma. Oral corticosteroids (OCS) are used in the treatment of the most severe asthma symptoms that don't respond to other medications or for severe exacerbations (NAEPP-EPR3, 2007, Weschler, 2009).

This report examines the percentage of adults (age 18 and older) with reported treatment for asthma in 1998-1999 and in 2008-2009 by selected demographic and socio-economic characteristics. Treated prevalence of asthma may differ across groups of adults both because of differences in the underlying prevalence of the disease and because of differences in access to medical care, as well as differences in the attitudes and beliefs affecting the use of medical care (Kriner et al., 2003; Poureslami et al. 2007). In addition this report examines the use of asthma medications among persons with reported treatment for asthma by the same demographic and socioeconomic characteristics.

The estimates presented in this report are average annual estimates for the two two-year time periods: 1998-1999, and 2008-2009 (Sarpong and Chevarley, 2012). The estimates are derived from the Household Component of the Medical Expenditure Panel Survey (MEPS-HC) augmented by the Medical Provider Component (MEPS-MPC). Unless otherwise indicated, all differences discussed in the text are statistically significant at the .05 level or better.

#### **Findings**

##### *Reported treatment for asthma by selected population characteristics*

Adults with reported treatment for asthma almost doubled from 5.5 million (2.7 percent) in 1998-1999 to 10.3 million (4.5 percent) in 2008-2009. As shown in figure 1 (1998-1999) and figure 2 (2008-2009) the treated prevalence of asthma increased for each of the age, race-ethnicity, gender, education, family income, and health insurance subgroups (except uninsured nonelderly adults). The within-group analysis for 2008-2009 show that the following subgroups were more likely to report treatment for asthma: adults age 65 and over were more likely than those ages 18-44 and 45-64; non-Hispanic whites and non-Hispanic blacks were more likely than Hispanics; females were more likely than males; those with less than 12 years education were more likely than those with 12 years or more education; those in families with poor/near poor or low income were more likely than those in high income families; among adults less than age 65, those with public-only insurance were more likely than those with private insurance (uninsured adults were less likely than those with private insurance); and among adults age 65 and older, those with Medicare and other public insurance were more likely than those with Medicare only.

#### **Highlights**

- Adults with reported treatment for asthma almost doubled from 5.5 million (2.7 percent) in 1998-1999 to 10.3 million (4.5 percent) in 2008-2009.
- Adults with reported treatment for asthma increased from 1998-1999 to 2008-2009 for all age, race-ethnicity, gender, education, family income, and health insurance groups (except uninsured nonelderly adults).
- For 2008-2009, the following subgroups of adults were more likely to report treatment for asthma: those age 65 and older; non-Hispanic whites and blacks; females; those with less than 12 years of education; those in families who are poor/near poor or have low income; among adults less than age 65 those with public-only insurance; and those age 65 and older with Medicare and other public insurance.
- Compared to 1998-1999, adults in 2008-2009 with reported treatment for asthma were more likely to use controller medications, and less likely to use relievers.
- Among adults with reported treatment for asthma, the use of controllers increased between 1998-1999 to 2008-2009 for females, adults in families with high income, and adults under age 65 with private insurance.
- In 2008-2009 the following subgroups of adults with reported treatment for asthma were more likely to use controllers: those ages 45-64 and age 65 and older; white non-Hispanics; those with more than 12 years education; those in families with high income; and, those ages 18-64 with private insurance.
- The following subgroups of adults with reported treatment for asthma were more likely to report relievers without the use of controllers in 2008-2009: adults ages 18-44; Hispanics; males; adults with less than 12 years of education; adults in poor/near poor and low income families; and those ages 18-64 with public-only insurance or uninsured.

*Adults with reported treatment for asthma using major classes of asthma medications: controllers, relievers, and oral corticosteroids (OCS)*

Among adults with reported treatment for asthma, changes in the use of three major types of asthma medications are examined: relievers used as required to treat intermittent asthma; controllers used in conjunction with relievers to treat persistent asthma; and oral corticosteroids (OCS) used for the most severe asthma symptoms that don't respond to other medications or for severe exacerbations (NAEPP-EPR3,2007, Weschler, 2009). Figure 3 presents the proportion of adults who used each of these major types of asthma medications in 1998-1999 and 2008-2009. The proportion of adults who used controllers increased from 54.3 percent in 1998-1999 to 59.9 percent in 2008-2009. The proportion of adults who used relievers decreased from 67.7 percent in 1998-1999 to 61.7 percent in 2008-2009. The use of 'relievers only' (without controllers) among adults did not change significantly from 1998-1999 to 2008-2009 (26.8 percent in 1998-1999 compared with 26.1 percent in 2008-2009). Nor did the use of OCS' among adults change significantly between 1998-1999 and 2008-2009 (13.7 in 1998-1999 compared with 12.4 percent in 2008-2009).

Among the different subgroups of adults with reported treatment for asthma (figures 4-10), the use of controllers increased between 1998-1999 to 2008-2009 for females, adults in families with high income, and adults under age 65 with private insurance.

*Adults with reported treatment for asthma using asthma medications by age*

Among adults with reported treatment for asthma in 2008-2009, adults ages 18-44 were less likely (48.1 percent) than those ages 45-64 years (65.4 percent) and age 65 years and older (70.3 percent) to use controllers (figure 4). In 2008-2009, the use of relievers only was higher for adults ages 18-44 (36.3 percent) than for those ages 45-64 years (22.3 percent) and 65 years and older (15.1 percent).

*Adults with reported treatment for asthma using asthma medications by race/ethnicity*

In 2008-2009, the percentage of adults with reported treatment for asthma who used controllers was higher for white non-Hispanics (64.6 percent) than for black non-Hispanics (50.4 percent) and Hispanics (41.4 percent) (figure 5). In 2008-2009, the use of relievers only was lower for non-Hispanic whites (23.7 percent) than for Hispanics (36.6 percent).

*Adults with reported treatment for asthma using asthma medications by sex*

Between 1998-1999 to 2008-2009, the use of controllers increased for female adults with reported treatment of asthma from 55.3 percent to 61.8 percent (figure 6). In 2008-2009, females were less likely (24.1 percent) than males (29.9 percent) to use 'relievers only.'

*Adults with reported treatment for asthma using asthma medications by education*

As shown in figure 7, adults with reported treatment for asthma in 2008-2009 with less than 12 years of education were less likely (52.6 percent) than those with more than 12 years of education (63.4 percent) to use controllers and adults with less than 12 years of education were more likely to use relievers only (29.9 percent) than adults with more than 12 years of education (23.2 percent).

*Adults with reported treatment for asthma using asthma medications by family income*

Between 1998-1999 to 2008-2009, the use of controllers increased for adults with reported treatment for asthma in families with high income from 56.2 percent to 67.5 percent (figure 8). In 2008-2009, adults in families with high income were more likely (67.5 percent) than those in families with poor/near poor income (51.0 percent), low income (56.8 percent), and middle income (58.9 percent) to use controllers (figure 8). Adults in families with high income in 2008-2009 were less likely (21.2 percent) to use 'relievers only' than those in poor/near poor families (29.8 percent) and those in low income families (30.7 percent).

*Adults ages 18-64 with reported treatment for asthma using asthma medications by health insurance status*

Between 1998-1999 to 2008-2009, the use of controllers increased for adults ages 18-64 with reported treatment of asthma and with private insurance from 56.0 percent to 63.5 percent (figure 9). In 2008-2009, adults ages 18-64 years with private insurance were more likely to use controllers (63.5 percent) than those with public-only insurance (46.9 percent) and those who were uninsured (30.9 percent). Among adults ages 18-64, the use of 'relievers' only was lower for adults with private insurance (25.3 percent) than for adults with public-only insurance (33.9 percent) and those who were uninsured (47.8 percent).

*Adults age 65 and older with reported treatment for asthma using asthma medications by health insurance status*

As shown in figure 10, there were no statistically significant differences in the use of controllers and no statistically significant differences in the use of 'relievers only' among the three insurance groups (Medicare only, Medicare and private, Medicare and public) among adults age 65 and older with reported treatment for asthma in 2008-2009.

## Data Source

The estimates in this Statistical Brief are derived from the MEPS Full Year Consolidated Data file, the Medical Condition file, and the Prescribed Medicines file for the data years 1998, 1999, 2008, and 2009.

## Definitions/Methodology

### *Adults with reported treatment for asthma*

The 1998, 1999, 2008, 2009 MEPS Medical Conditions file are used with the three digit ICD-9-CM diagnosis condition variable (ICD9CODX) to construct indicator variables of asthma. Sample adults were identified with reported treatment for asthma by tying the condition diagnosis code (ICD-9-CM "493") to any reported health services utilization (i.e., home health, inpatient hospital stays, outpatient, office-based, emergency room visits, and prescribed medicines) during the year.

### *Asthma medications*

Each drug that was listed as purchased or otherwise obtained in the MEPS Prescribed Medicines (PMED) Files was linked to the Multum Lexicon database, a product of Cerner Multum, Inc. We used the Multum drug name variable which gives the active ingredient(s) in each drug to identify three general types of asthma medications: controllers, relievers and oral corticosteroids. Controller medications included ICS (inhaled corticosteroids), ILABA (inhaled long acting beta-agonists), OLABA (oral long acting beta-agonists), LTRA (leukotriene receptor antagonists), MXS (methylxanthines), NSA (non-steroidal anti-allergy agents), and ICS-ILABA combinations. Relievers were primarily comprised of SABA (inhaled short acting beta agonists), but also included ACB (anti-cholinergic bronchodilators), SANB (short acting non-beta selective agents) and SABA-ACB combinations. Oral corticosteroids included prednisone, dexamethasone, methylprednisolone and other steroids.

### *Utilization*

Indicator variables were created to identify adults who received each of the major classes of asthma medications—controllers, relievers and oral corticosteroids. For this report, "relievers-only" denotes adults who, at any time during the year, were using relievers but no controllers to treat their asthma. We also created indicator variables to capture use of subclasses of controller medications and their combinations. For combination drugs, an adult was identified as having had each medication comprising the combination therapy. For example, if an adult had a combination drug that included both an ICS and an ILABA, then the adult was identified as having used each of these types of asthma medications. Utilization estimates are presented as the proportion of adults using each of the three general types of asthma medications.

### *Age*

In this report, age is the last reported age in each year for each person in the sampled households. Adult refers to persons age 18 and older.

### *Race/ethnicity*

Classifications by race/ethnicity in this report are based on the following three race/ethnicity groups: white single race non-Hispanic; black single race non-Hispanic; and Hispanic. Classification by race and ethnicity is based on information reported in MEPS for each family member. First, respondents were asked if the person's main national origin or ancestry was Puerto Rican; Cuban; Mexican, Mexican American, or Chicano; Other Latin American; or other Spanish. All persons whose main national origin or ancestry was reported as one of these Hispanic groups, regardless of racial background, were classified as Hispanic. All other persons were classified according to their reported race. The residual category that includes non-Hispanics of other races or multiple races is not shown but is included in the total.

### *Education*

All adults (those age 18 and older) were assigned the number of years of education completed and reported when they first entered MEPS. The following education categories were based on highest grade of regular school completed: less than 12 years; 12 years; more than 12 years.

### *Family income*

In MEPS, personal income from all members within a household in a family (CPS definition of family) is summed to create family income. Potential sources of income include annual earnings from wages, salaries, bonuses, tips, and commissions; business and farm gains and losses; unemployment and Workers' Compensation payments; interest and dividends; alimony, child support, and other private cash transfers; private pensions; individual retirement account (IRA) withdrawals; Social Security and Department of Veterans Affairs payments; Supplemental Security Income and cash welfare payments from public assistance, TANF (Temporary Assistance for Needy Families; formerly known as Aid to Families with Dependent Children, or AFDC); gains or losses from estates, trusts, partnerships, S corporations, rent, and royalties; and a small amount of "other" income. In this report, poverty status is the ratio of the family's income to the Federal poverty thresholds, which control for the size of the family and the age of the head of the family. The following classification of poverty status was used:

- *Poor/near poor income*: adults in families with income less than 125 percent of the Federal poverty line, including those who reported negative income.
- *Low income*: adults in families with income from 125 percent to less than 200 percent of the Federal poverty line.
- *Middle income*: adults in families with income from 200 percent to less than 400 percent of the Federal poverty line.
- *High income*: adults in families with income greater than or equal to 400 percent of the Federal poverty line.

### *Health insurance status*

Individuals 18 to 64 years of age were classified in the following three insurance categories based on household responses to health insurance status questions:

- *Any private health insurance*: Individuals who, at any time during the year, had insurance that provides coverage for hospital and physician care (other than Medicare, Medicaid, or other public hospital/physician coverage)

were classified as having private insurance. Coverage by TRICARE (Armed Forces–related coverage) was also included as private health insurance. Insurance that provides coverage for a single service only, such as dental or vision coverage, was not included.

- **Public coverage only:** Individuals were considered to have public-only coverage only if they met both of the following criteria: 1) they were not covered by private insurance at any time during the year, and 2) they were covered by one of the following public programs at any point during the year: Medicare, Medicaid, or other public hospital/physician coverage.
- **Uninsured:** The uninsured were defined as people not covered by private hospital/physician insurance, Medicare, TRICARE, Medicaid, or other public hospital/physician programs at any time during the entire year or period of eligibility for the survey.

For individuals age 65 and older, the following insurance categories were used:

- **Medicare plus private (including TRICARE):** Individuals who at any time during the year were covered by TRICARE or a supplemental private insurance policy in addition to Medicare.
- **Medicare plus other public coverage:** Individuals were considered to have Medicare plus other public coverage if they were covered by Medicare and met both of the following criteria: 1) they were not covered by TRICARE or a supplemental private policy at any time during the year, and 2) they were covered by one of the following public programs other than Medicare at any point during the year: Medicaid; or other public hospital/physician coverage.
- **Medicare only:** This group includes adults who had Medicare fee-for-service coverage or who were enrolled in Medicare HMOs and did not report any private or public supplemental insurance coverage.
- A very small number of persons age 65 and older did not report Medicare coverage. This category is not shown in the table but is included in the total.

## About MEPS-HC

The MEPS Household Component (HC) is a nationally representative longitudinal survey that collects detailed information on health care utilization and expenditures, health insurance, and health status, as well as a wide variety of social, demographic, and economic characteristics for the U.S. civilian noninstitutionalized population. It is cosponsored by the Agency for Healthcare Research and Quality and the National Center for Health Statistics.

For more information about MEPS, call the MEPS information coordinator at AHRQ (301) 427-1656 or visit the MEPS Web site at <http://www.meps.ahrq.gov/>.

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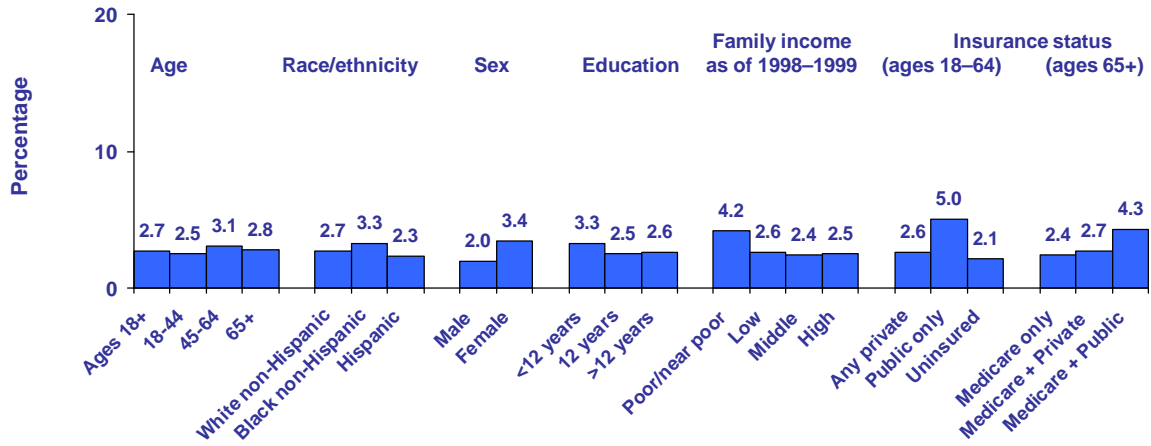
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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other MEPS data and tools, and to share suggestions on how MEPS products might be enhanced to further meet your needs. Please e-mail us at [MEPSProjectDirector@ahrq.gov](mailto:MEPSProjectDirector@ahrq.gov) or send a letter to the address below:

Steven B. Cohen, PhD, Director  
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Agency for Healthcare Research and Quality  
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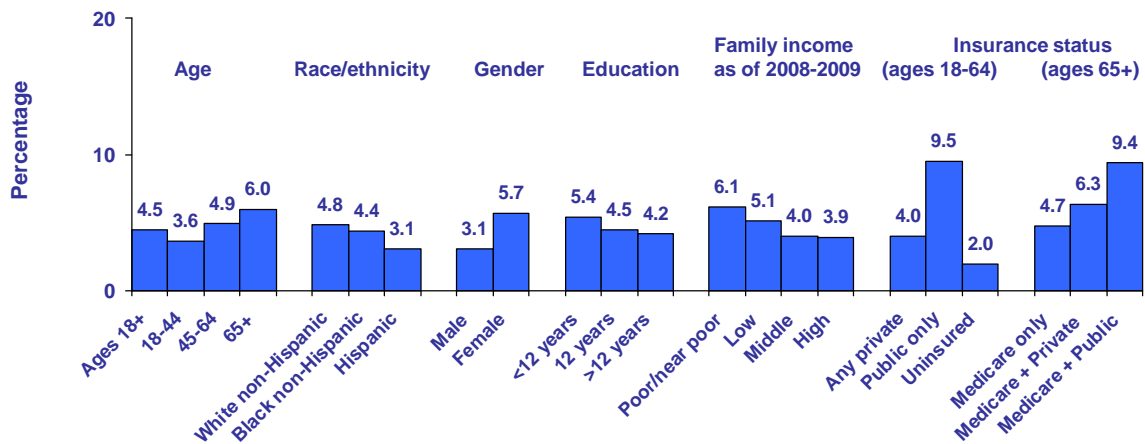
**Figure 1. Percentage of adults with reported treatment for asthma, 1998–1999**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999



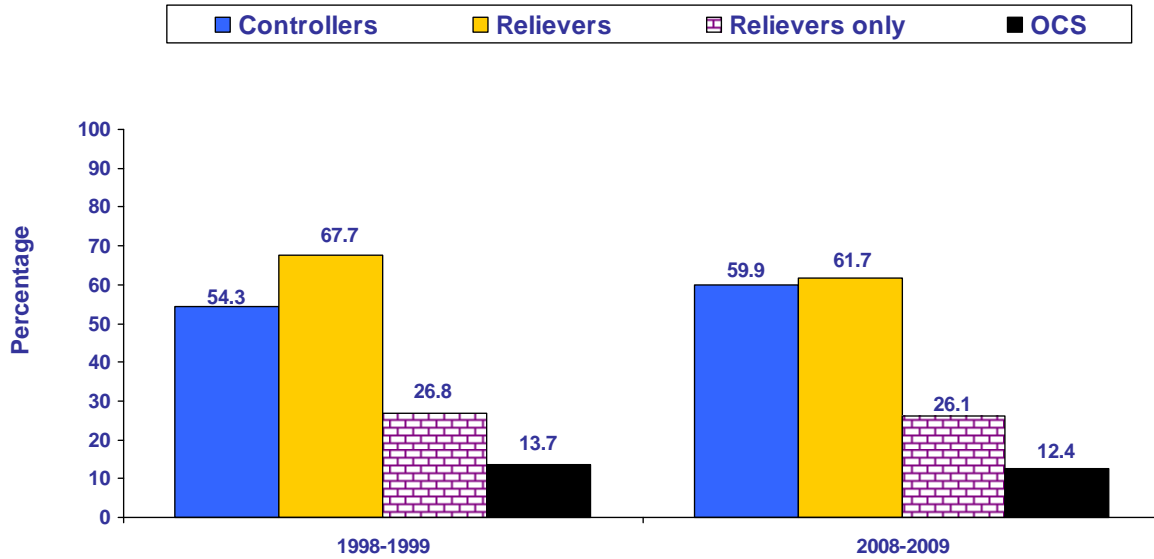
**Figure 2. Percentage of adults with reported treatment for asthma, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 2008–2009



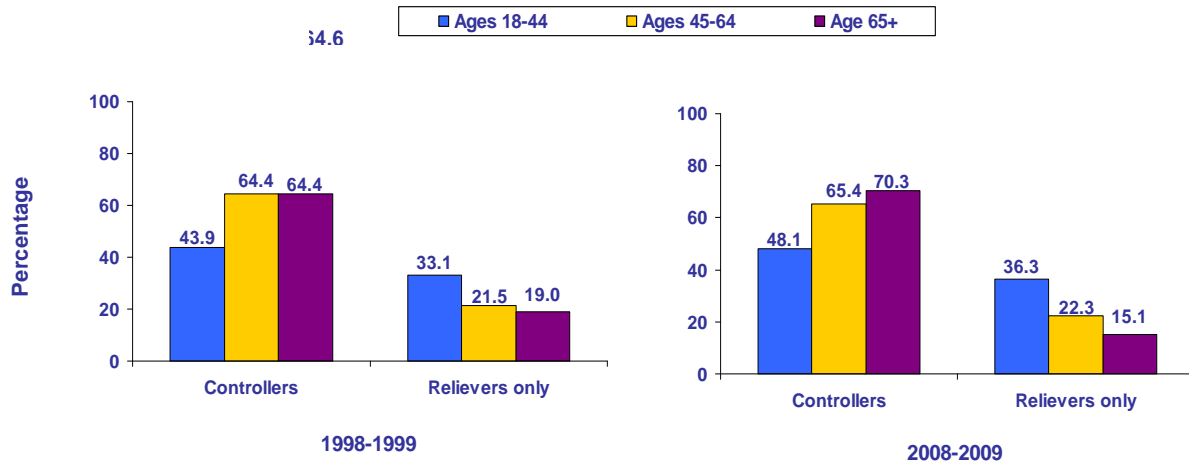
**Figure 3. Percentage of adults with reported treatment for asthma by asthma medications, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



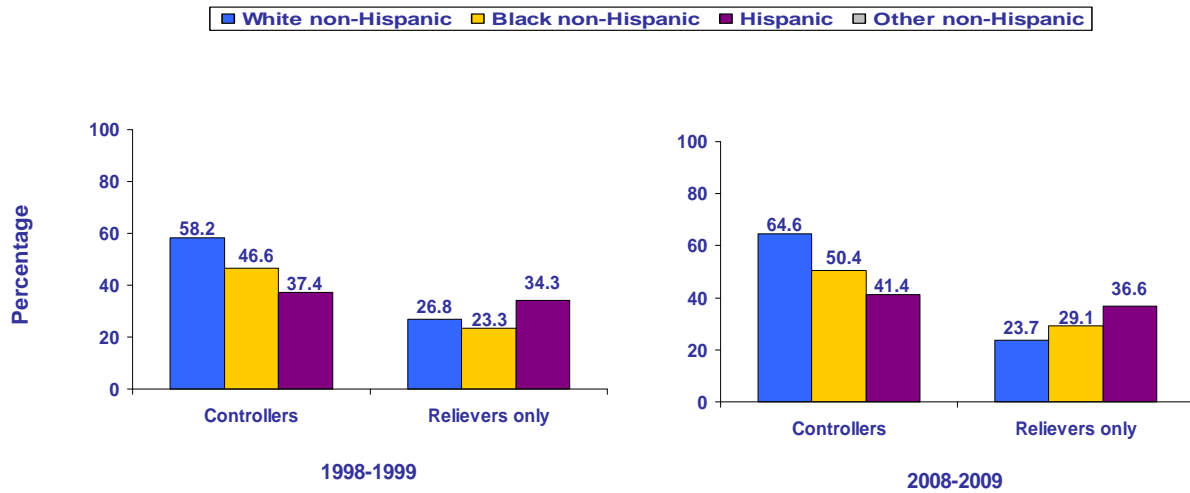
**Figure 4. Percentage of adults treated for asthma who use controllers and ‘relievers only’ by age, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



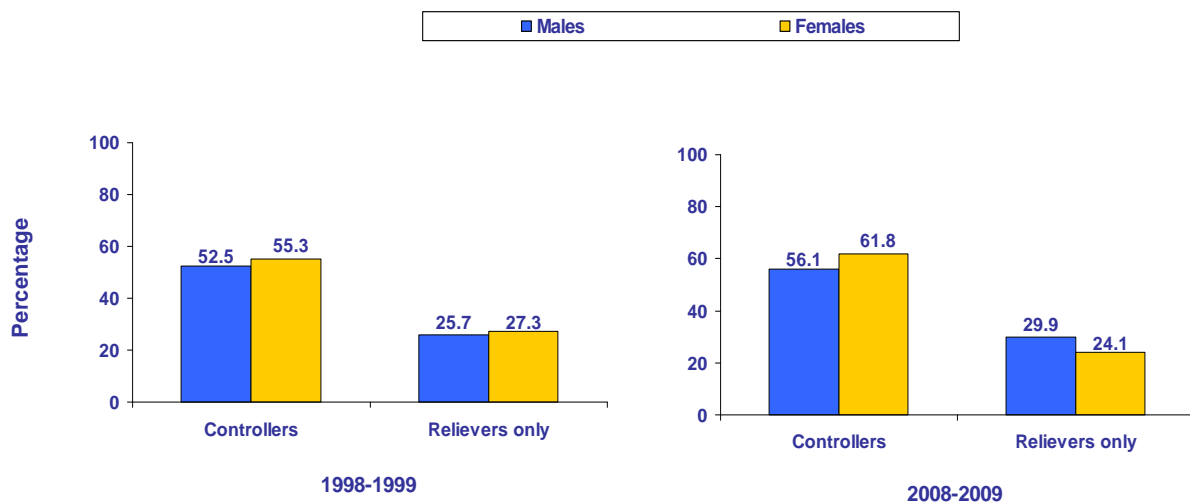
**Figure 5. Percentage of adults treated for asthma who use controllers and ‘relievers only’ by race/ethnicity, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



**Figure 6. Percentage of adults treated for asthma who use controllers and ‘relievers only’ by gender, 1998–1999, 2008–2009**

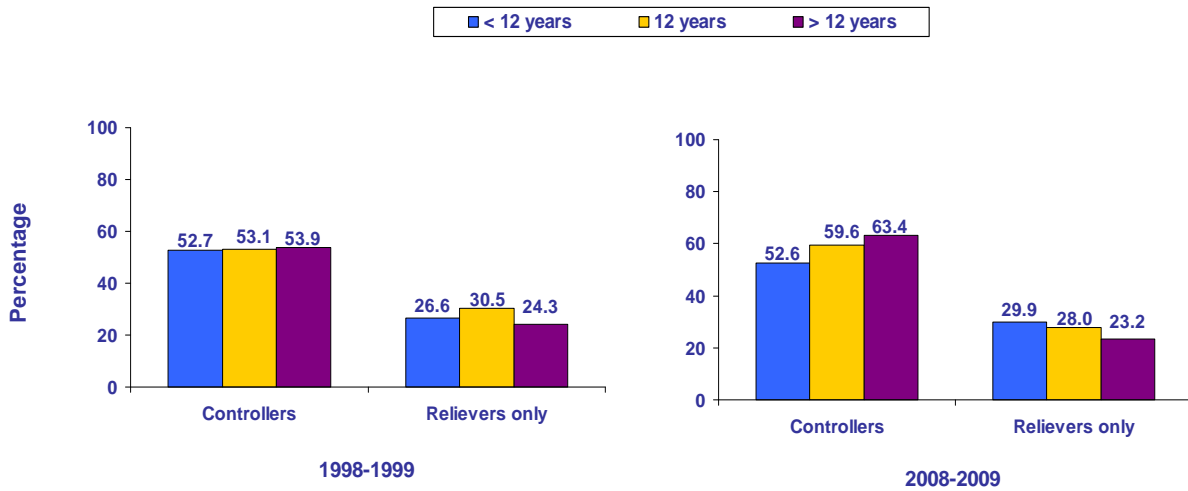


Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009





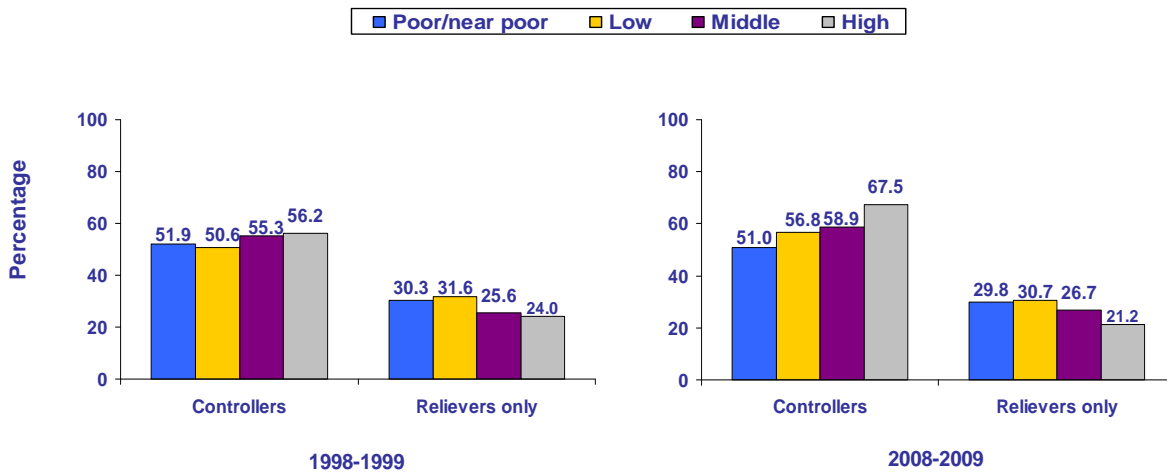
**Figure 7. Percentage of adults treated for asthma who use controllers and 'relievers only' by education, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



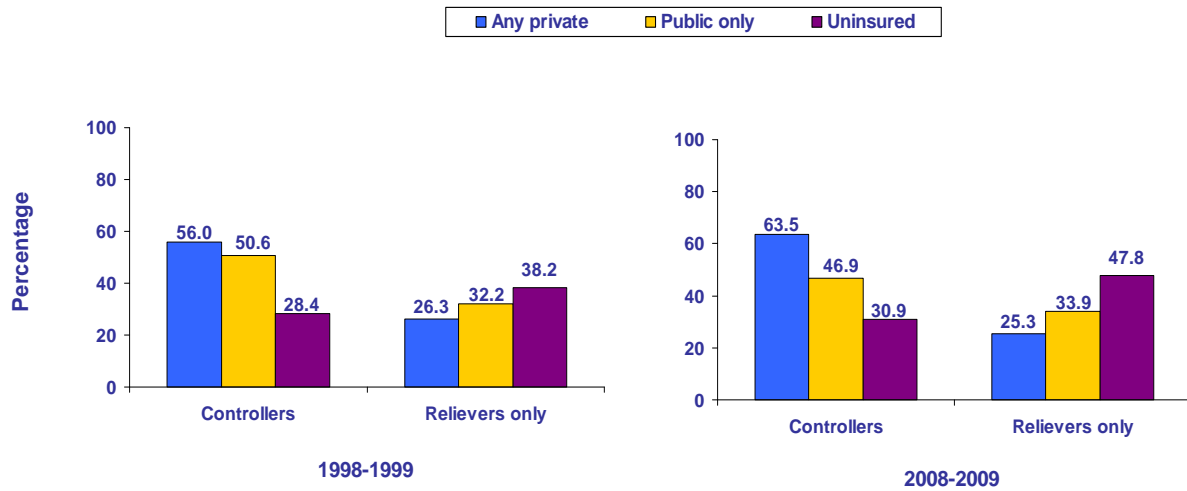
**Figure 8. Percentage of adults treated for asthma who use controllers and 'relievers only' by family income, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



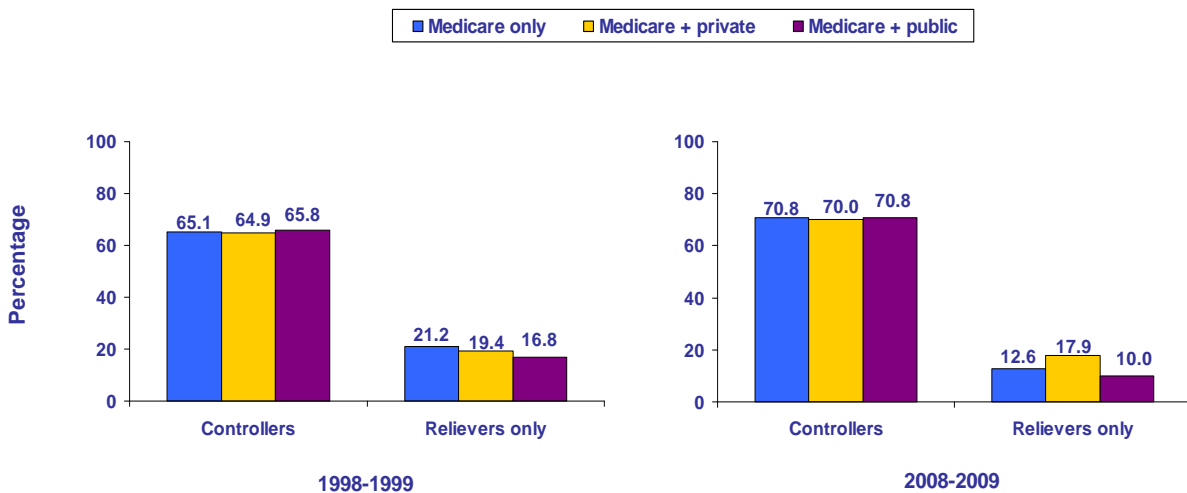
**Figure 9. Percentage of adults ages 18–64 treated for asthma who use controllers and ‘relievers only’ by health insurance status, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009



**Figure 10. Percentage of adults ages 65 and over treated for asthma who use controllers and ‘relievers only’ by health insurance status, 1998–1999, 2008–2009**



Source: Center for Financing, Access, and Cost Trends, AHRQ, Household Component of the Medical Expenditure Panel Survey, 1998–1999 and 2008–2009