



Asthma in Maricopa County

A Report to the Maricopa County Community from
Arizona HealthQuery
a Community—University Partnership

By

Mary E. Rimsza, MD, FAAP
Research Professor

Amy Bartels, MPH
Senior Research Analyst

Wade Bannister, MS
Data Analytics Manager



Center for Health Information & Research
A Division of the Seidman Research Institute
School of Health Management and Policy

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Arizona State University
Post Office Box 874011
Tempe, Arizona 85287-4011



660 South Mill Avenue
Suite 312
Tempe, Arizona 85281

The Center for Health Information & Research **CHIR**

is a division of the L. William Seidman Research Institute and the School of Health Management and Policy {SHMP} in Arizona State University's W. P. Carey School of Business. CHIR is a multi-disciplinary team whose focus includes health care, the health care workforce, occupational illness and injury, medical malpractice, health care economics, disability, and clinical quality. CHIR is home of Arizona HealthQuery, a community health data system created by the voluntary participation of health care insurers and providers in Arizona.

William G. Johnson, PhD. {William.G.Johnson@asu.edu}

is a Professor of Economics in SHMP and the Department of Economics at Arizona State University, and the Director of CHIR. He is an Affiliate Professor in the Biomedical Informatics Department of the Ira A. Fulton School of Engineering at Arizona State University. His previous appointments include the economics department at Rutgers University and The Maxwell School of Syracuse University, with affiliate appointments at the medical schools of Rutgers University, the State University of New York, and the University of Arizona.

Mary Rimsza, MD, FAAP, FSAM. {Mary.Rimsza@asu.edu}

is Co-Director and Research Professor of CHIR. Currently the Chair of Arizona's Child Fatality Review Program, Dr. Rimsza previously served as Chair of the Department of Pediatrics at Maricopa Integrated Health System, CEO of MedPro, and Director of Health at ASU. Board-certified in both Pediatric and Adolescent Medicine, Dr. Rimsza is also a Professor of Pediatrics at Mayo Graduate School of Medicine and the University of Arizona College of Medicine. In addition to being Editor of the Pediatric Review and Education Program for the American Academy of Pediatrics, she has produced numerous publications on adolescent medicine and collaborates on research projects in pediatric populations in Maricopa and Yuma Counties.

Community Partners

AZHQ is made possible by the cooperation of the following members of the Maricopa County community:

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Executive Summary

Asthma is a chronic disease affecting both children and adults. The disease is a significant health burden in the United States; in the past two decades, asthma has been increasing in prevalence and severity. Some of the largest increases have been seen in urban areas [1, 2]. In 2002, data from the National Health Interview Survey indicates approximately 20 million Americans currently have asthma [3]. From 1980 to 1999, office visits in the United States (U.S.) for asthma increased from 5.9 million to 10.8 million per year¹ and from 1992 to 1999, the number of emergency department (ED) visits for asthma increased 36% [4].

The information on asthma in Maricopa County presented in this report is generated from the *Arizona HealthQuery (AZHQ)*, the U.S. Census Bureau and the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The information includes morbidity and mortality for asthma with analyses by gender, race/ethnicity and age. This report also presents data for a longitudinal cohort of people who received care for asthma in Maricopa County in 2001, 2002 and 2003.

According to *Arizona HealthQuery* data, the majority of Maricopa County people seeking health care for asthma in 2003 were insured by public sources, including both Arizona Health Care Cost Containment System (AHCCCS) and Medicare. Approximately 9% of people with asthma were uninsured at some time in 2003. Uninsured patients with asthma are likely to rely on the ED for asthma care because of their limited ability to receive appropriate and timely preventive health care services for asthma. Indeed, we found that the uninsured patients with asthma had, on average, one visit to the ED in 2003 resulting in a diagnosis of asthma compared to 0.6 visits for privately insured patients with asthma and 0.3 for asthma patients with public insurance. Other key findings are:

Compared to the overall United States population, the 2003 population of Maricopa County was younger, had fewer Blacks (3.7% in Maricopa County vs. 11.9% in the U.S.) and more individuals of Hispanic origin (28.1% in Maricopa County vs. 13.9% in the U.S.), and more American Indians or Alaska Natives (1.6% in Maricopa County vs. 0.7% in the U.S.).

The average rate of asthma for people receiving care in Maricopa County was 5%, with a higher rate of 8% for children ages 5 to 14 years.

Blacks and American Indians had higher rates of asthma than White or Hispanic people and, on average, Blacks and American Indians with asthma had more visits per person to emergency departments for asthma than other races with asthma.

¹ During 1992-1999, this estimate included both physician office visits and hospital outpatient department visits, with the latter category including approximately one million visits annually.

People with asthma, insured both publicly and privately during a year, had higher rates of health care utilization for asthma than all other insurance groups.

Compared to the zip codes with the lowest rates, the zip codes with high rates of asthma also had higher rates of poverty (15.5% to 3.5%), a higher percentage of Blacks in the area (9.6% to 0.9%), and fewer people with a high school education (75.5% to 96.3%). For children with asthma, birth to 19 years old, 30% to 50% of all ED visits were for asthma.

Uninsured people with asthma had, on average, more visits to the ED per person for all diagnoses and for asthma-related diagnoses than people who were continuously insured.

The majority of ED visits (57%) of privately insured people with asthma were for asthma.

Blacks with chronic asthma had the highest proportion of their total ED visits for asthma (31%).

Among children, boys are more likely to have chronic asthma than girls.

Uninsured individuals with chronic asthma had, on average, the highest number of ED visits per person for all diagnoses (16.0) while people with chronic asthma covered by public insurance had the lowest, an average of 4.2 per person for all diagnoses.

The uninsured with asthma had, on average, the highest number of hospitalizations (21.0) per person for all diagnoses over the three year period 2001-2003.

In Maricopa County, during the years 2000-2004, 188 individuals died with asthma listed as the cause of death.

Over the four year period of 2000-2004, the rate of deaths attributable to asthma in Maricopa County decreased from 1.4 per 100,000 people in 2000 to 0.8 per 100,000 people in 2004.

Background

This report, Asthma in Maricopa County, is one in a series of Community Reports using data from *Arizona HealthQuery (AZHQ)*. The *AZHQ* database provides valuable information for the community on the prevalence of disease across health systems as well as demographic information on the gender, race, and ages of affected patients. Data from *AZHQ* is supplemented with information from the U.S. Census Bureau and the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The *AZHQ* data system is unique for its ability to provide vast amounts of continuously updated health care information and link patients across systems and over time. The data is voluntarily shared with *AZHQ* by health systems, physician groups, hospitals, and governmental agencies such as AHCCCS. Each of the data partners maintains control over their data sets. Currently *AZHQ* contains information on over 5.2 million people who have obtained health care in Arizona, of which 3.4 million are residents of Maricopa County.

Asthma

Asthma is an inflammation of the lungs that causes intermittent narrowing and blockage of the airways. Symptoms include coughing, wheezing, chest tightness, and shortness of breath. In 1998, the cost of asthma care accounted for an estimated \$12.7 billion dollars annually. Fifty-eight percent of these costs were attributable to direct medical expenditures and 42% were for indirect costs [5]. Approximately one-third of the 20 million people who currently have asthma are children [3]. Childhood asthma is the most common cause of missed school days, emergency department visits, and hospitalizations in the U.S. On average, children who have asthma miss one week of school each year due to the disease [6]. Morbidity from asthma is also substantial among adults. In 2002, adults over the age of 18 who were currently employed missed 11.8 million work days due to asthma [3] and in 2000, asthmatic adults experienced impaired physical or mental health 10 days each month on average, nearly double the rate of adults who never had asthma [7].

Data Sources

Arizona HealthQuery Data

Arizona HealthQuery (AZHQ) is a community health data system that houses essential and comprehensive health information for Arizona residents. This data system is located at Arizona State University and managed by the Center for Health Information and Research (CHIR). *AZHQ* collects and houses health care information voluntarily provided by state agencies, hospitals, health care systems, insurers, physician groups, community health centers, and other ambulatory care centers.

AZHQ serves as a resource for performing analyses directed at improving health and health care costs, identifying medical service needs of certain populations, providing outcomes evaluations, performing quality improvement assessments, and conducting cost management analyses as well as operational analyses for contributing data partners.

This report reviews the data of children and adults in Maricopa County who received care for asthma during the years 2001, 2002, and 2003. Asthma care is defined as health care utilization by people who have had a health care encounter with a diagnosis of asthma (ICD9 493.00-493.99). Information on asthma mortality for the years 2000 through 2004 is presented using data from *AZHQ* and Arizona Department of Health Services².

U.S. Census Bureau Data

The 2003 American Community Survey (ACS) provides general demographic statistics for Maricopa County. Part of the Census Bureau's decennial census, the ACS is a nationwide survey administered each month throughout Arizona and the United States. The survey is limited to the household population and excludes the population living in institutions, college dormitories, and other group quarters³. Although 2004 data are currently available, 2003 data are used in this report to correspond with *AZHQ's* encounter data. Maricopa County continues to see population growth on an annual basis; however the 2003 population distributions presented in Appendix Table 1 are similar to the 2004 population distributions. The exception would be the percent unemployed in the civilian labor force. In 2003, the percent unemployed was 7.3%, whereas in 2004, 5.4% were unemployed.

² *AZHQ* includes the Vital Statistics birth and death files from the Arizona Department of Health Services (ADHS). Mortality rates are calculated using the same population denominator for ADHS's annual *Arizona Health Status and Vital Statistics* reports.

³ The ACS is conducted primarily through self-report. The questionnaire mailing packages include general information about the ACS and an instruction guide explaining how to complete the questionnaire. Questionnaires and instruction guides are available in both English and Spanish. The ACS provides estimates of demographic, housing, social, and economic characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups at 65,000 people or more.

Behavioral Risk Factor Surveillance System Data

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based system of health surveys that generate information about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury. This report uses a subset of BRFSS data, the Selected Metropolitan/Micropolitan Area Risk Trends (SMART), which has been produced to provide some local area estimates⁴. This report includes data from the 2003 and 2004 BRFSS SMART surveys. The 2003 survey includes two questions about adult asthma:

- 1) Have you ever been told by a doctor, nurse or other health professional that you had asthma?
- 2) Do you still have asthma?

The 2004 survey includes the same two questions plus questions on adult asthma history, current healthcare utilization for asthma and childhood asthma.

⁴ These local areas are identified counties within metropolitan or micropolitan statistical areas (MMSA) as defined by the Office of Management and Budget. The data set was produced by adding new analysis weights designed to correspond to the 2003 and 2004 population estimates for each eligible county within a selected MMSA. The additional weights were post-stratified to the county-level.

Definitions

Terms used throughout the text and graphs are defined below:

Race and Ethnicity: In the figures and tables, race and ethnicity are reported together. The term Hispanic refers to people of Hispanic or Latino origin but they may be of any race. Single races (White, Black, American Indian/Alaska Native, Asian/Pacific Islander and Other) are non-Hispanic or Latino. Due to smaller sample sizes, we combined Asians and Pacific Islanders into one category although they are usually reported separately in U.S. Census reports. In *AZHQ*, race and ethnicity are included on the encounter record and are typically self-reported categories. We recognize that the categories are based on social context and have no biological or genetic basis; not everyone identifies herself or himself by these categories.

Insurance Status (AZHQ): We created four patterns of health insurance coverage experienced by individuals utilizing some form of health care in the analysis period. The patterns represent combinations of three possible states of coverage: uninsured, publicly insured (e.g., AHCCCS, Medicare), or privately insured (including employment-related coverage). Three of the four patterns are defined by consistent insurance coverage over the analysis period (public only, private insurance only, and public and private insurance). The uninsured pattern is defined by periods of either chronic or sporadic spells of uninsurance. The insurance patterns are:

Uninsured: The patient had at least one gap without insurance during the analysis period.

Public/Private continuously insured: The patient was insured by a combination of public and private payers during the analysis period with no gaps in insurance.

Public continuously insured: All health care encounters during the analysis period were for public payers (e.g. AHCCCS and Medicare) with no gaps in insurance or other coverage.

Private continuously insured: All health care encounters during the analysis period are for private payers with no gaps in insurance or other coverage.

Other: None of the above categories are applicable.

Asthma: When we refer to asthma rates or prevalence from *AZHQ* in the text and graphs we are referring to the rate of health care utilization for patients with a diagnosis of asthma (ICD9 493.00 to 493.99 as the primary or secondary diagnosis). There may be individuals who have been diagnosed with asthma but are not included in the *AZHQ* database. The BRFSS prevalence reported is based on self-reported survey data.

Asthma Rate (AZHQ): Indicates the rate of health care utilization for patients with at least one health care visit during 2003 with a diagnosis of asthma.

$$\frac{\text{Number of patients who utilized care in 2003 with a diagnosis of asthma}}{\text{Number of patients who utilized care in 2003}}$$

Chronic Asthma Rate (AZHQ): Chronic asthma is defined as having at least one health care visit per year in each of the years 2001, 2002 and 2003 with a diagnosis of asthma.

$$\frac{\text{Number of patients with at least one visit in 2001, 2002 and 2003 with a diagnosis of asthma}}{\text{Number of patients with at least one health care visit in 2001, 2002 and 2003}}$$

Asthma Rate (BRFSS): Indicates the weighted percentage of respondents who responded that they have been told at some point they had a diagnosis of asthma and still have the diagnosis.

$$\frac{\text{Number of respondents who indicate they currently have asthma}}{\text{Number of respondents completing survey}} \times \text{Maricopa County weight}$$

Results

The results are presented in three sections. The first section presents a cross-sectional overview of the characteristics and utilization behaviors of people who were treated for asthma in Maricopa County in 2003. The second section presents a longitudinal overview of people for whom *AZHQ* contains three years of data (2001, 2002, and 2003). Examining individuals with three consecutive years of data permits us to depict trends over time that are not affected by changes in the underlying population. This examination also provides a better picture of healthcare utilization by children and adults with chronic asthma. The final section presents data on asthma-related mortality in Maricopa County for the years 2000 through 2004.

Prevalence of Asthma in Maricopa County, 2003

The prevalence of asthma varies across geographic communities, gender, and racial/ethnic groups. According to the BRFSS in 2003, 8% of Maricopa County adult respondents have been told by a doctor they currently have asthma. This figure is slightly higher than the national average of 7.5% (Figure 12) [8, 9]. Overall, in 2003, 5% (56,271) of the 1,216,394 Maricopa County residents included in the *AZHQ* database received care for asthma. There was a higher prevalence of health care utilization for asthma for children ages 5 to 14 years old than for people of all other age groups (Figure 13). There is a much higher prevalence of asthma in some areas of Maricopa County than others (Figure 24 and Table 1). The reasons for this increased prevalence is not clear but could be due to increased risk factors for asthma in these communities including poverty, poor housing conditions, greater exposure to allergens, and air pollution [2, 10]. Using data from the Census 2000, Table 1 compares zip codes with high rates of asthma to zip codes with low rates of asthma. The zip codes with high rates of asthma also had higher rates of poverty (15.5% compared to 3.5%), a higher percentage of Blacks in the area (9.6% compared to 0.9%), and fewer people with a high school education (75.5% compared to 96.3%). There is also research indicating asthma prevalence, hospitalizations and mortality are higher for Blacks compared to non-Hispanic Whites [11-14]. Our data indicates that in 2003, Blacks had higher rates of health care utilization for asthma than members of other racial/ethnic groups (Figure 16).

The other results of the 2003 cross-sectional analysis show:

Approximately 16% of the people living in Maricopa County in 2003 were foreign born [15]. Among people at least five years old living in Maricopa County in 2003, 25% spoke a language other than English at home. Of those speaking a language other than English at home, 80% spoke Spanish and 20% spoke a language other than Spanish or English (Figure 5).

Female householder families have much higher rates of poverty than all families, 26% compared to 10% for all families. Families with related children under five headed by a female have more than four times the rate of poverty for married couple families with related children under five (Figure 7).

The majority of patients with asthma were continuously insured in 2003.

Approximately 9% of patients with asthma were uninsured at some time in 2003 (Figure 8). This compares to 10% of all patients in *AZHQ* who are uninsured (Figure 9).

For hospital visits, the majority of patients with asthma were covered by public insurance (Figure 11). For emergency department visits, 41% of asthma patients were covered by public insurance and 45% by private insurance (Figure 10).

Among adult respondents of the BRFSS with asthma, almost 40% indicate they experienced no symptoms of asthma in the previous 30 days and 71% had no problems with sleeping due to asthma. Another 20% experienced symptoms of asthma every day [9].

Among people covered by a combination of public and private insurance, the rate of health care utilization for asthma was more than double the rate for the uninsured, regardless of age (Figures 14 and 15).

Blacks and American Indians had the highest rates of asthma whereas Hispanics had the lowest asthma rates (Figure 16).

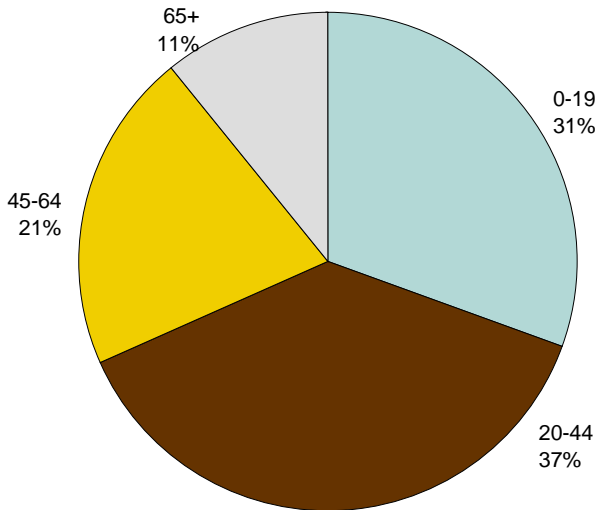
Blacks and American Indians with asthma had a higher number of ED visits per person on average than other racial/ethnic groups with asthma (Figure 19).

Adults ages 20 to 44 with asthma had more ED visits per person on average than other age groups with asthma (Figure 18).

2003 Maricopa County Demographics

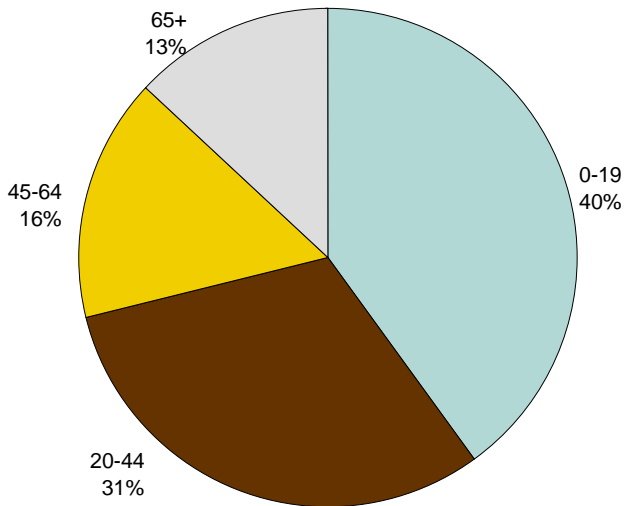
Age Distribution

Figure 1— U.S. Census Bureau Age Distribution of Maricopa County, 2003 (N = 3.3 Million)



Source: U.S. Census Bureau: American Community Survey 2003 Data Profile, Maricopa County, Arizona, General Demographic Characteristics

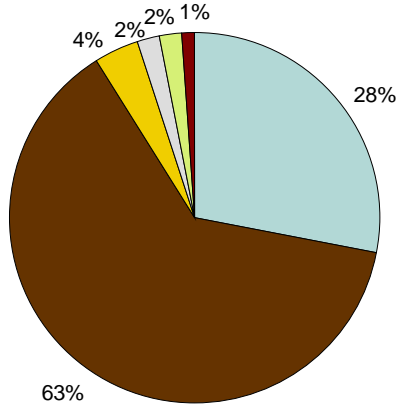
Figure 2— Age Distribution of Maricopa County, 2003 (N = 1.2 Million)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

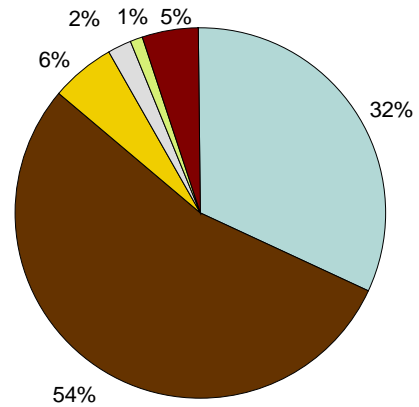
Race and Ethnicity Distribution

Figure 3— U.S. Census Bureau Race/Ethnicity Distribution of Maricopa County, 2003
(N = 3.3 Million)

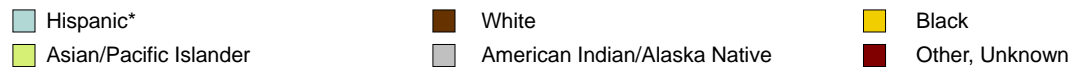


Source: U.S. Census Bureau: American Community Survey 2003 Data Profile, Maricopa County, Arizona, General Demographic Characteristics

Figure 4— Race/Ethnicity Distribution of Maricopa County, 2003
(N = 1.2 Million)



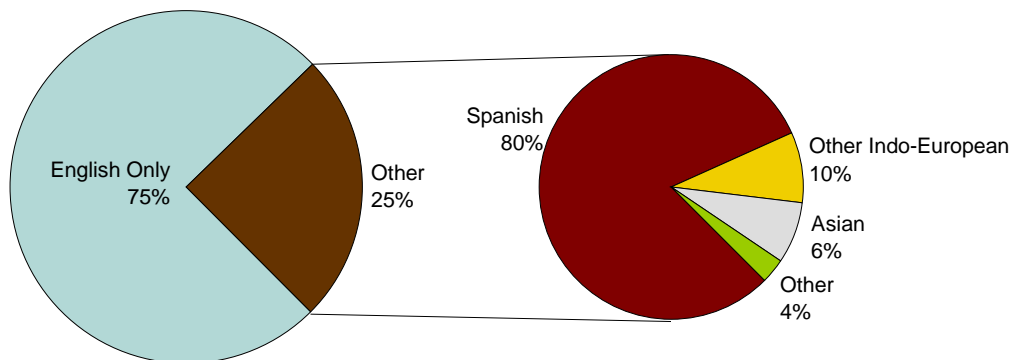
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003



*Hispanic may be of any race. Single races are non-Hispanic.

Language

Figure 5— Maricopa County 2003 Population Older than 5 Years Old, Language Spoken at Home*
(N = 3.1 Million)

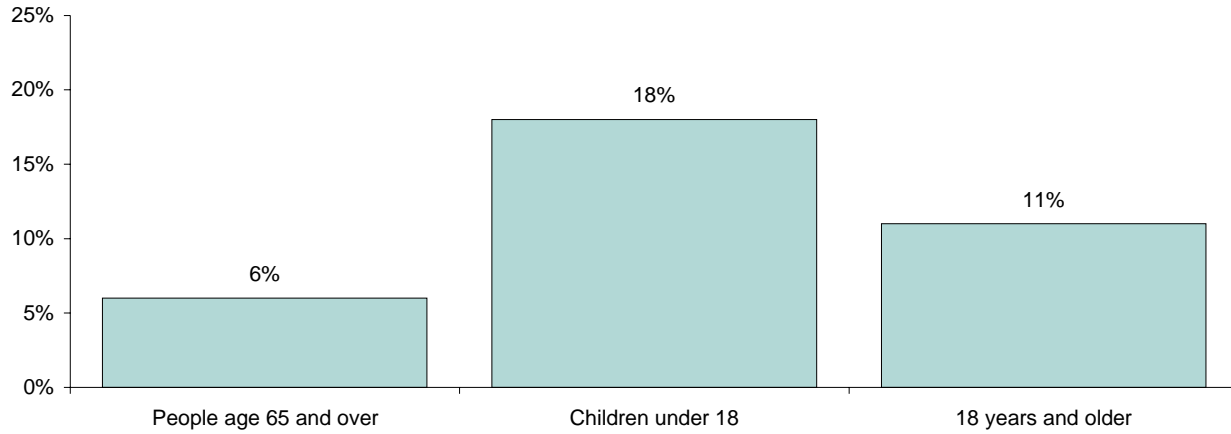


Source: U.S. Census Bureau: American Community Survey 2003 Data Profile, Maricopa County, Arizona, Selected Social Characteristics

*The person sometimes or always spoke a language other than English at home. If the person spoke more than one language other than English, the person was to report the language spoken most often or, if they cannot determine the one spoken most often, the language learned first.

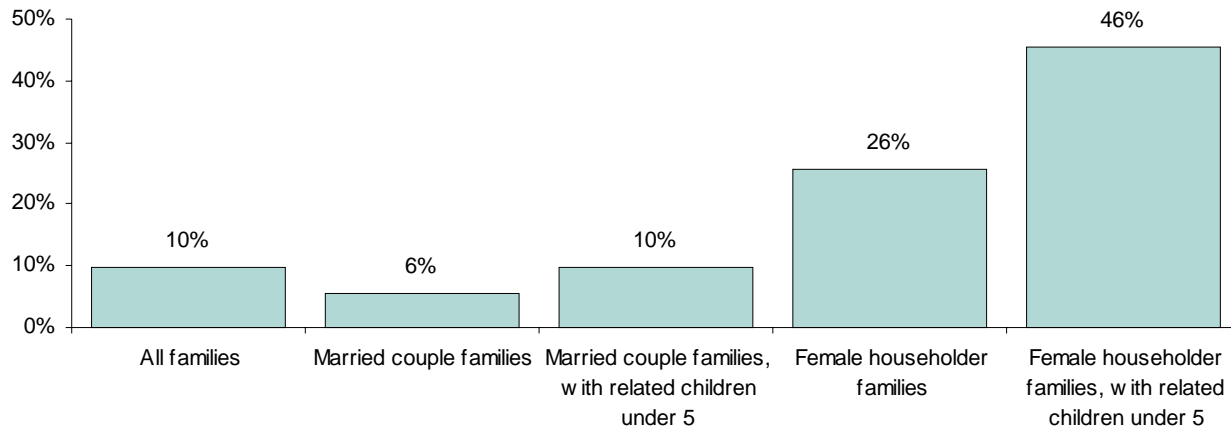
Income

Figure 6— Poverty Rates in Maricopa County for Individuals, 2003 (N = 3.3 Million)



Source: U.S. Census Bureau: American Community Survey 2003 Data Profile, Maricopa County, Arizona, Selected Economic Characteristics

Figure 7— Poverty Rates in Maricopa County for Families, 2003 (N = 824,000)



Source: U.S. Census Bureau; American Community Survey, 2004 Multiyear Profile, 2003 Percent Distributions, Maricopa County, Arizona, Selected Economic Characteristics

AZHQ Insurance Distribution

Figure 8— Insurance Distribution of Maricopa County, Patients with Asthma, 2003 (N = 56,271)

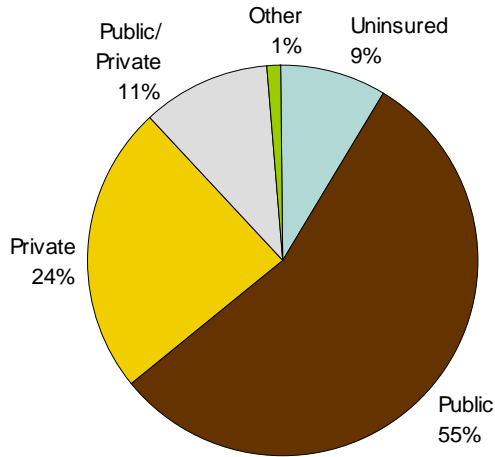
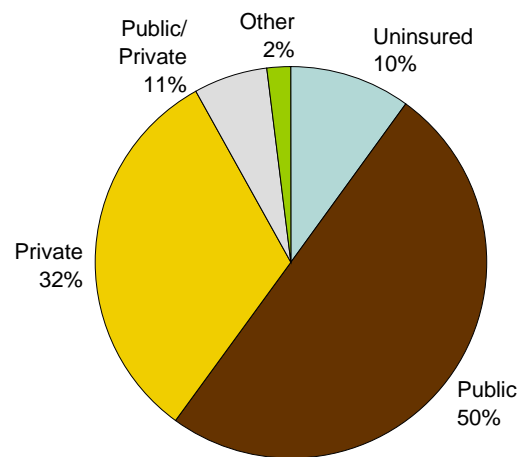
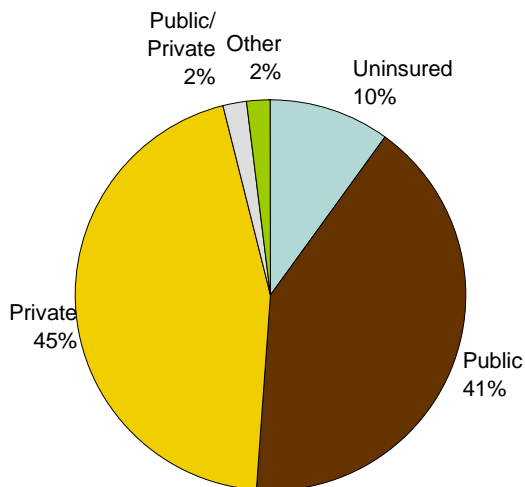


Figure 9— Insurance Distribution of Maricopa County, All Patients, 2003 (N = 1.2 Million)



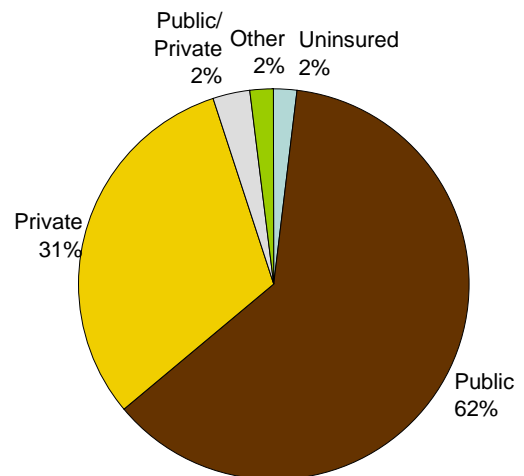
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

Figure 10— Insurance Distribution of Maricopa County, Patients with Asthma, Emergency Department Only, 2003 (N = 19,997)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

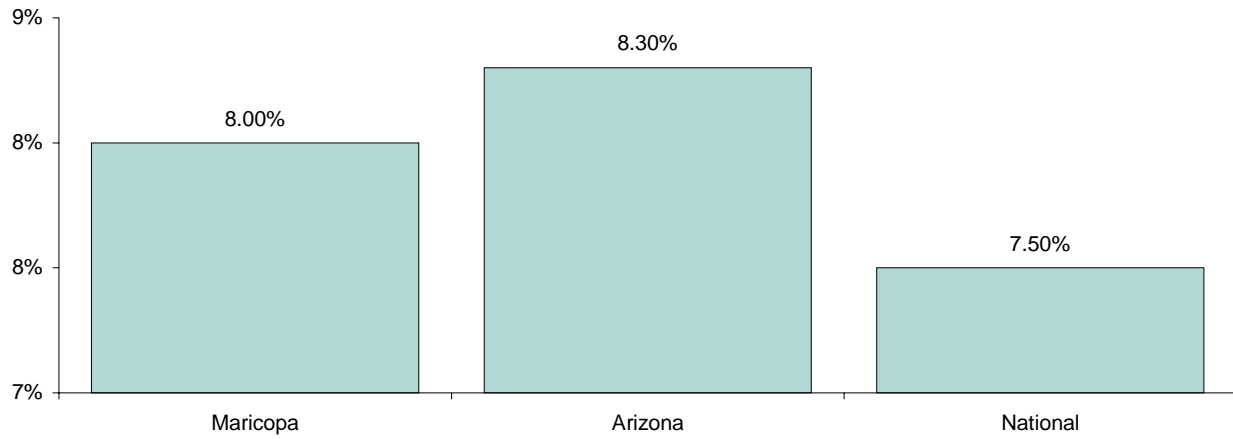
Figure 11— Insurance Distribution of Maricopa County, Patients with Asthma, Inpatient Hospitalization Only, 2003 (N = 23,157)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

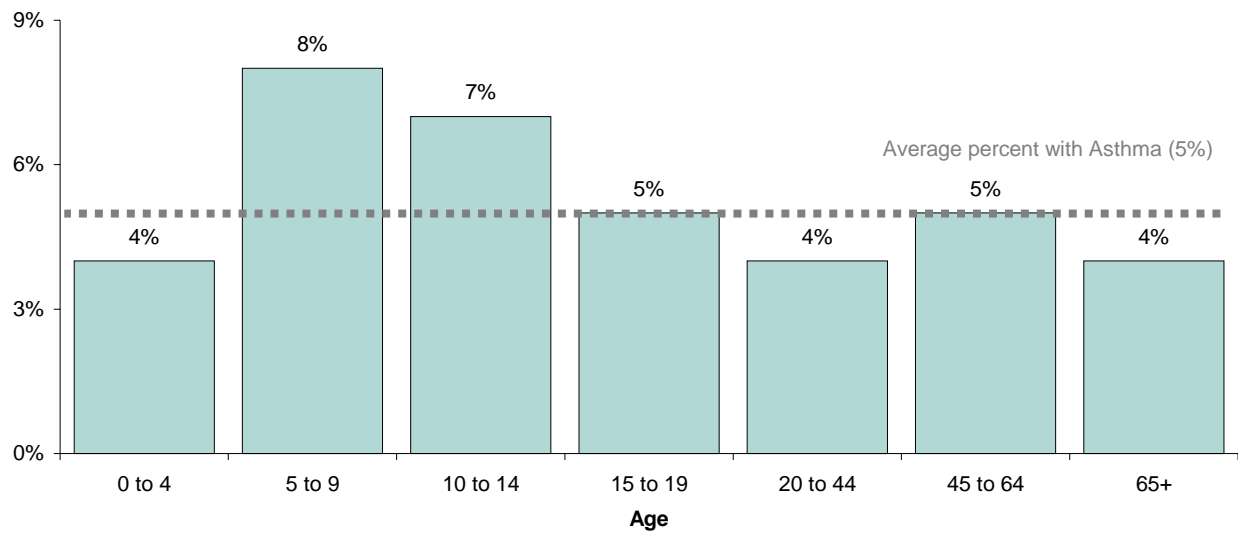
2003 Asthma Results

Figure 12— Current Adult Asthma Prevalence, 2003 BRFSS



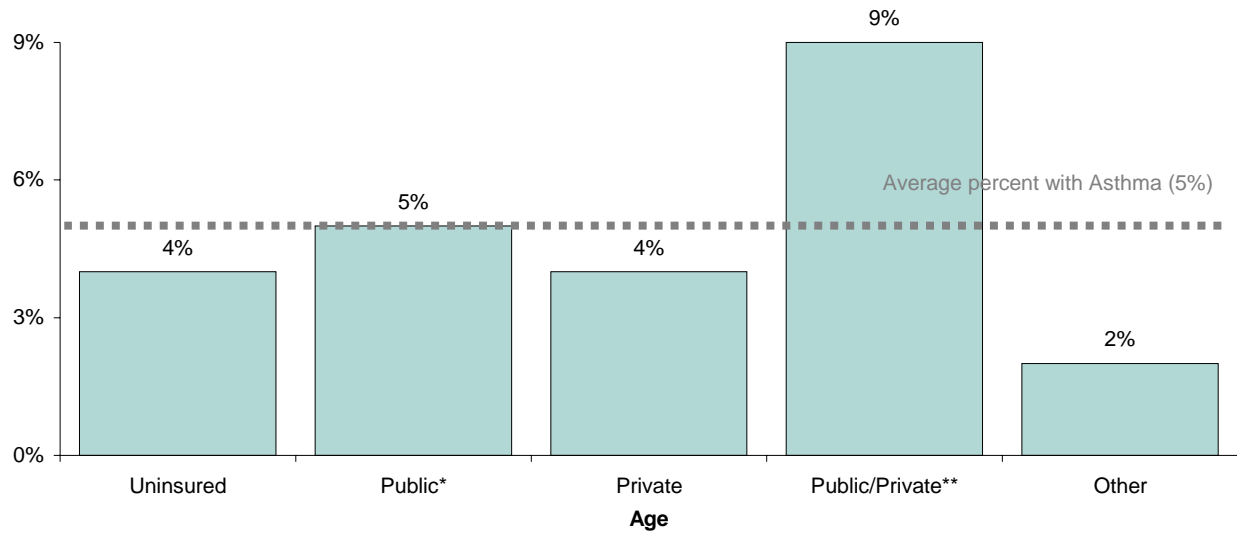
Source: 2003 BRFSS SMART; adults who have been told they currently have asthma, percentages are weighted

Figure 13— Asthma Rates in Maricopa County by Age, 2003 (N = 1.2 Million)



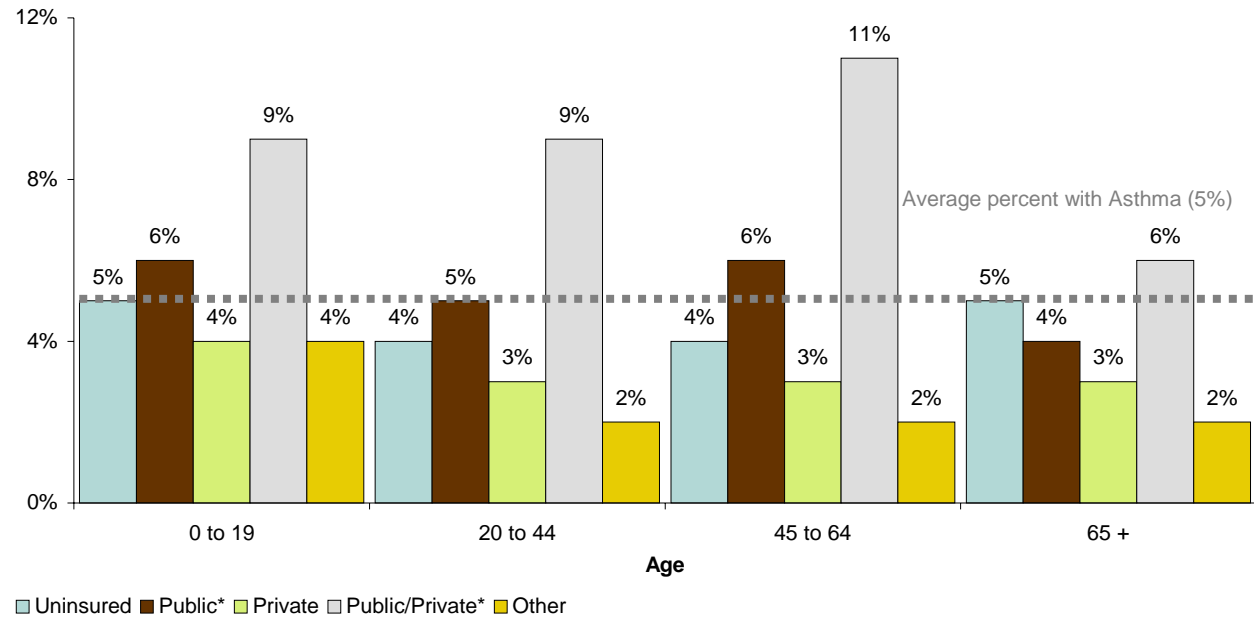
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: Total number with asthma = 56,271

Figure 14— Asthma Rates in Maricopa County by Insurance Type, 2003 (N = 1.2 Million)



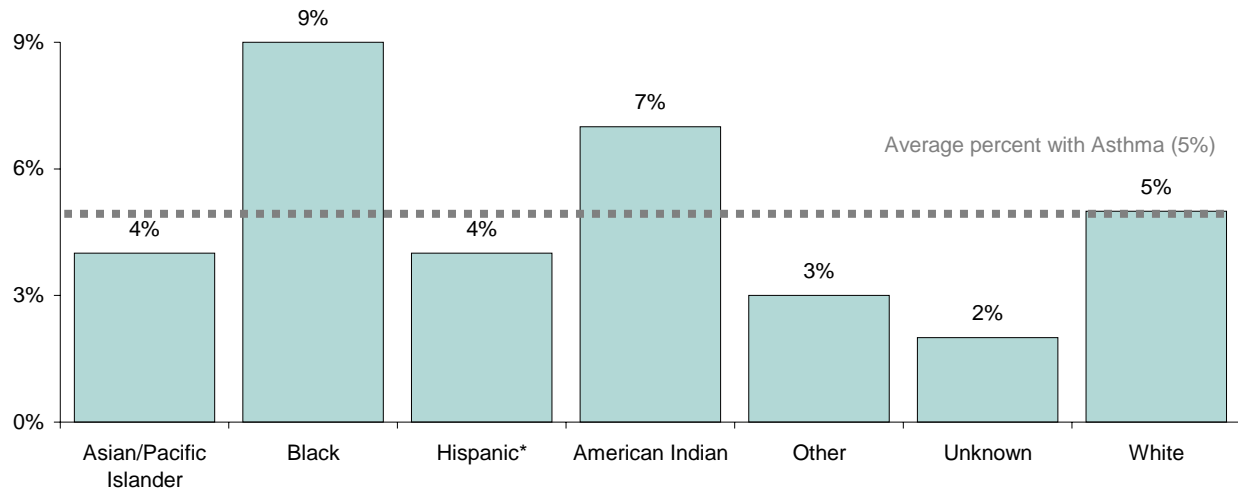
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: Total number with asthma = 56,271
 *Public insurance includes AHCCCS and Medicare and other public insurers.
 **Public/Private includes individuals who had both private and public insurance during the year.

Figure 15— Asthma Rates in Maricopa County by Insurance Type and Age Group, 2003 (N = 1.2 Million)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: Total number with asthma = 56,271
 *Public insurance includes AHCCCS and Medicare and other public insurers.
 **Public/Private includes individuals who had both private and public insurance during the year.

Figure 16— Asthma Rates in Maricopa County by Race/Ethnicity, 2003 (N = 1.2 Million)

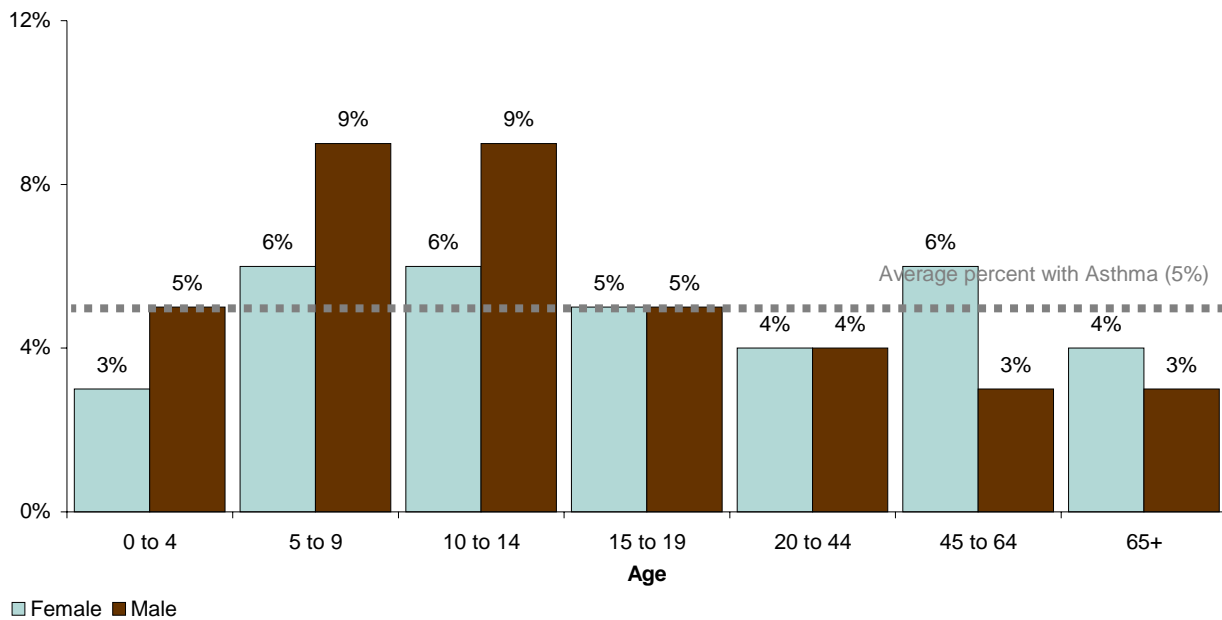


Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

Note: Total number with asthma = 56,271

*Hispanic may be of any race. Single races are non-Hispanic.

Figure 17— Asthma Rates in Maricopa County by Gender and Age Group, 2003 (N = 1.2 Million)

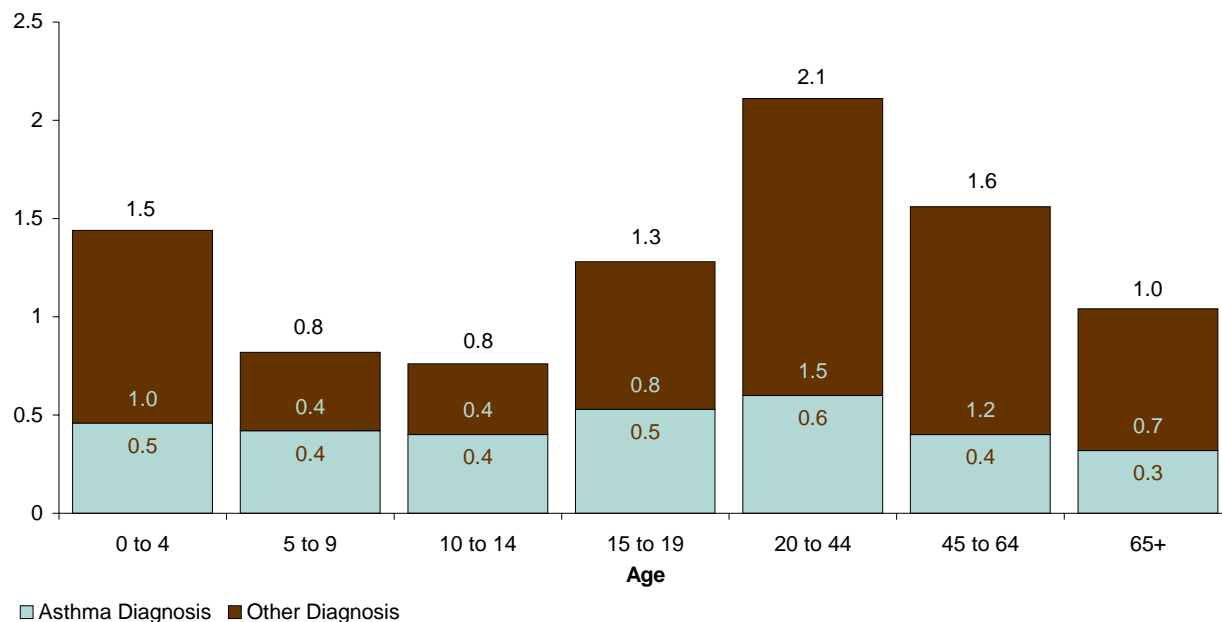


■ Female ■ Male

Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

Note: Total number with asthma = 56,271

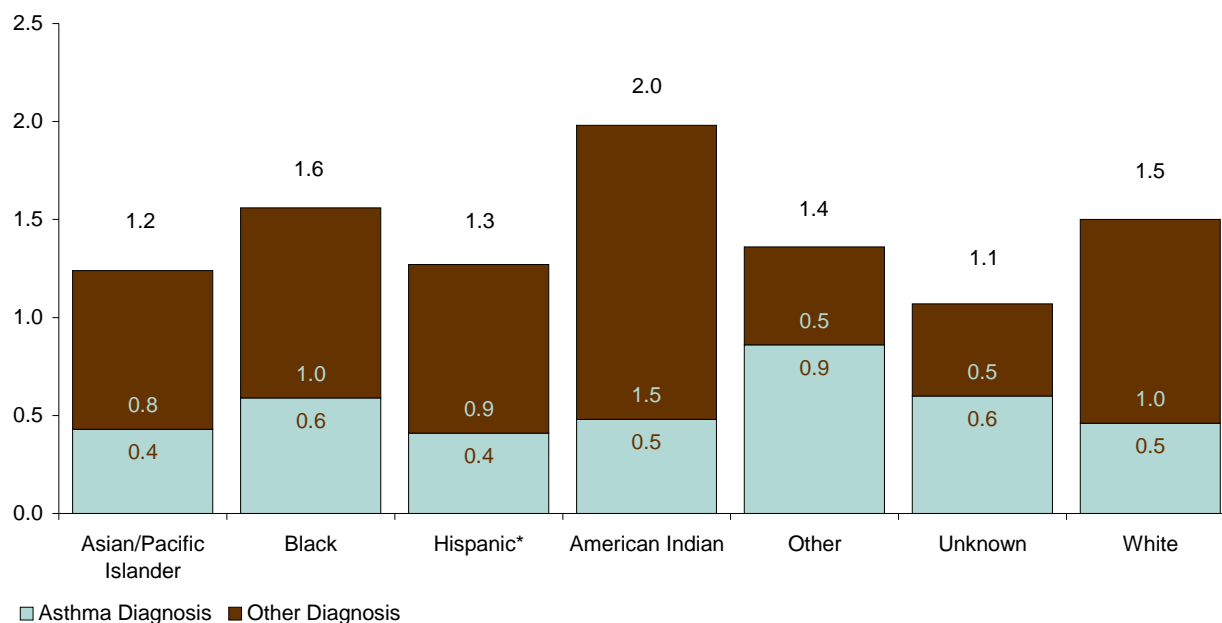
Figure 18— Number of ED Visits per Person with Asthma in Maricopa County by Age, 2003
(N = 56,271)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.

Figure 19— Number of ED Visits per Person with Asthma in Maricopa County by Race/Ethnicity, 2003
(N = 56,271)

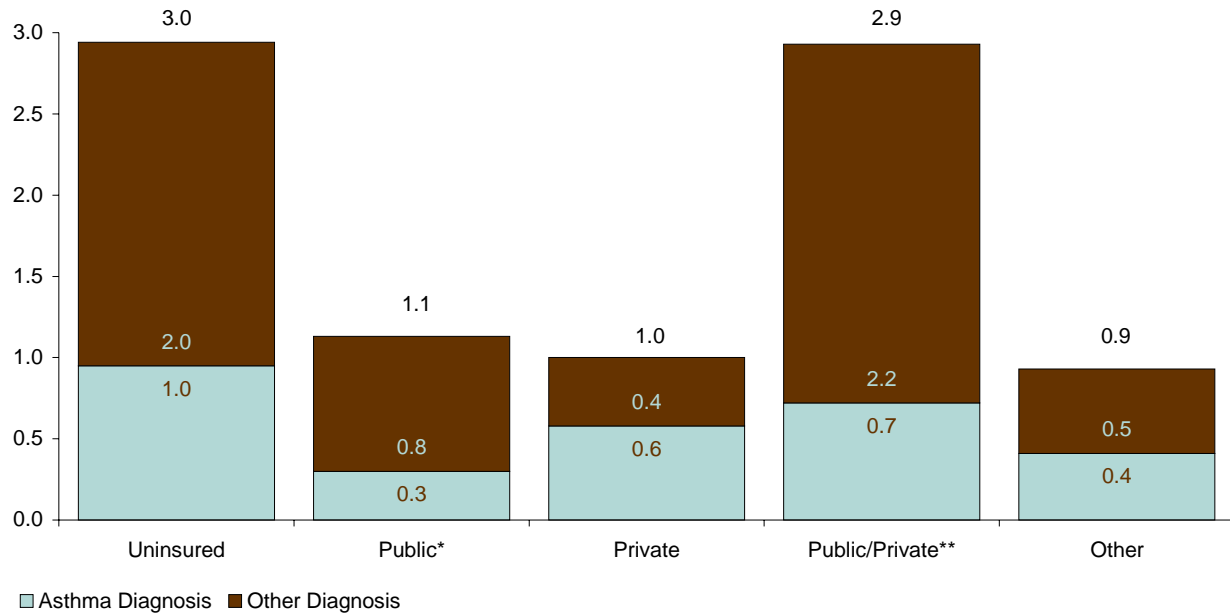


Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003

Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.

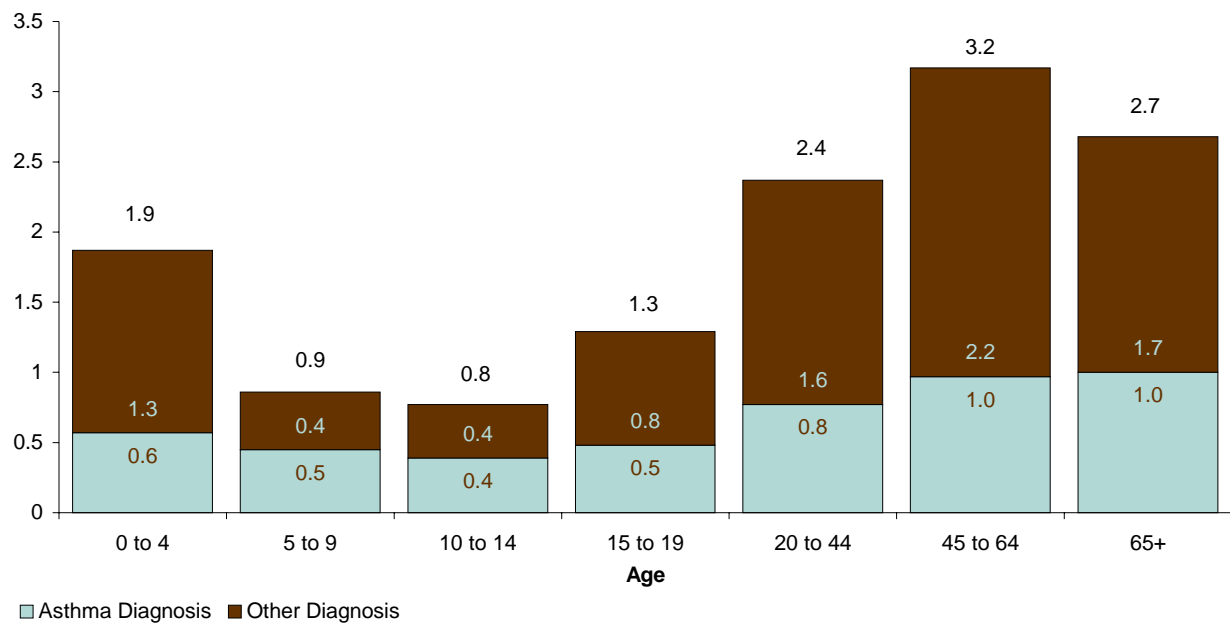
*Hispanic may be of any race. Single races are non-Hispanic.

Figure 20— Number of ED Visits per Person with Asthma in Maricopa County by Insurance Status, 2003 (N = 56,271)



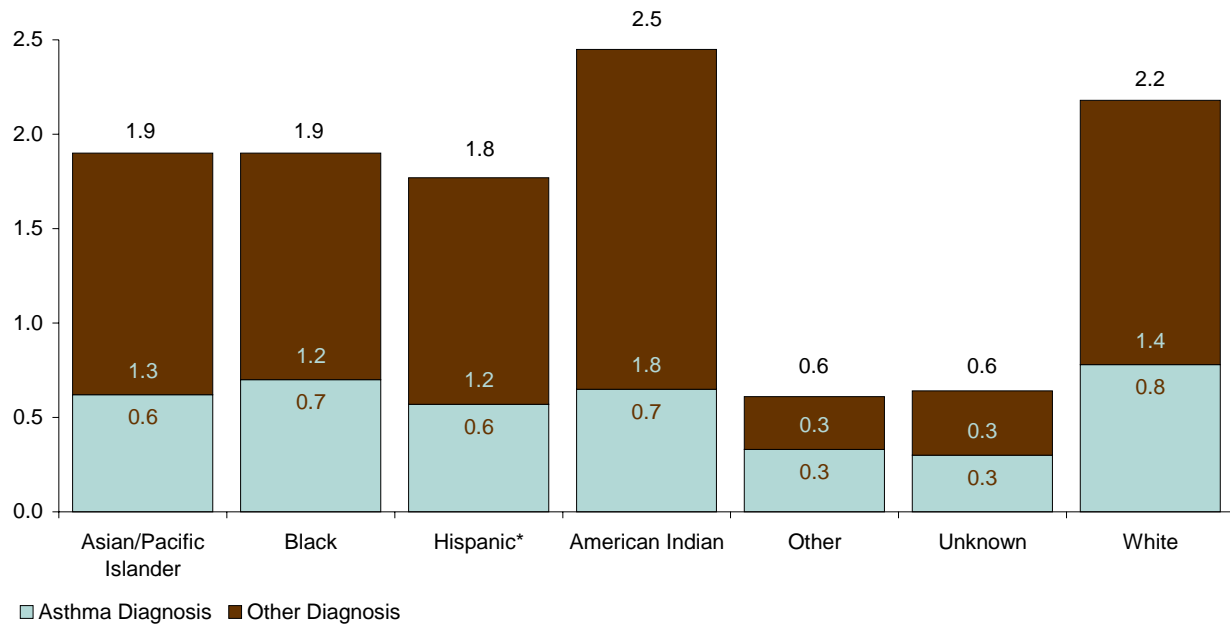
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.
 *Public insurance includes AHCCCS and Medicare and other public insurers.
 **Public/Private includes individuals who had both private and public insurance during the year.

Figure 21— Number of Hospitalizations per Person with Asthma in Maricopa County by Age, 2003 (N = 56,271)



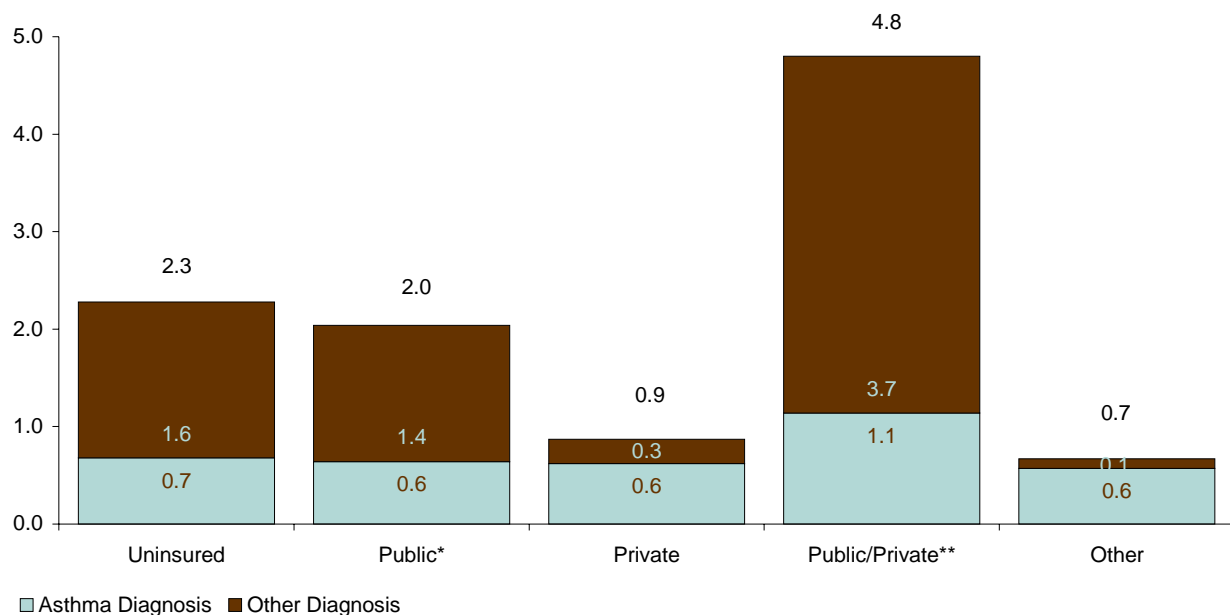
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.

Figure 22— Number of Hospitalizations per Person with Asthma in Maricopa County by Race/Ethnicity, 2003 (N = 56,271)



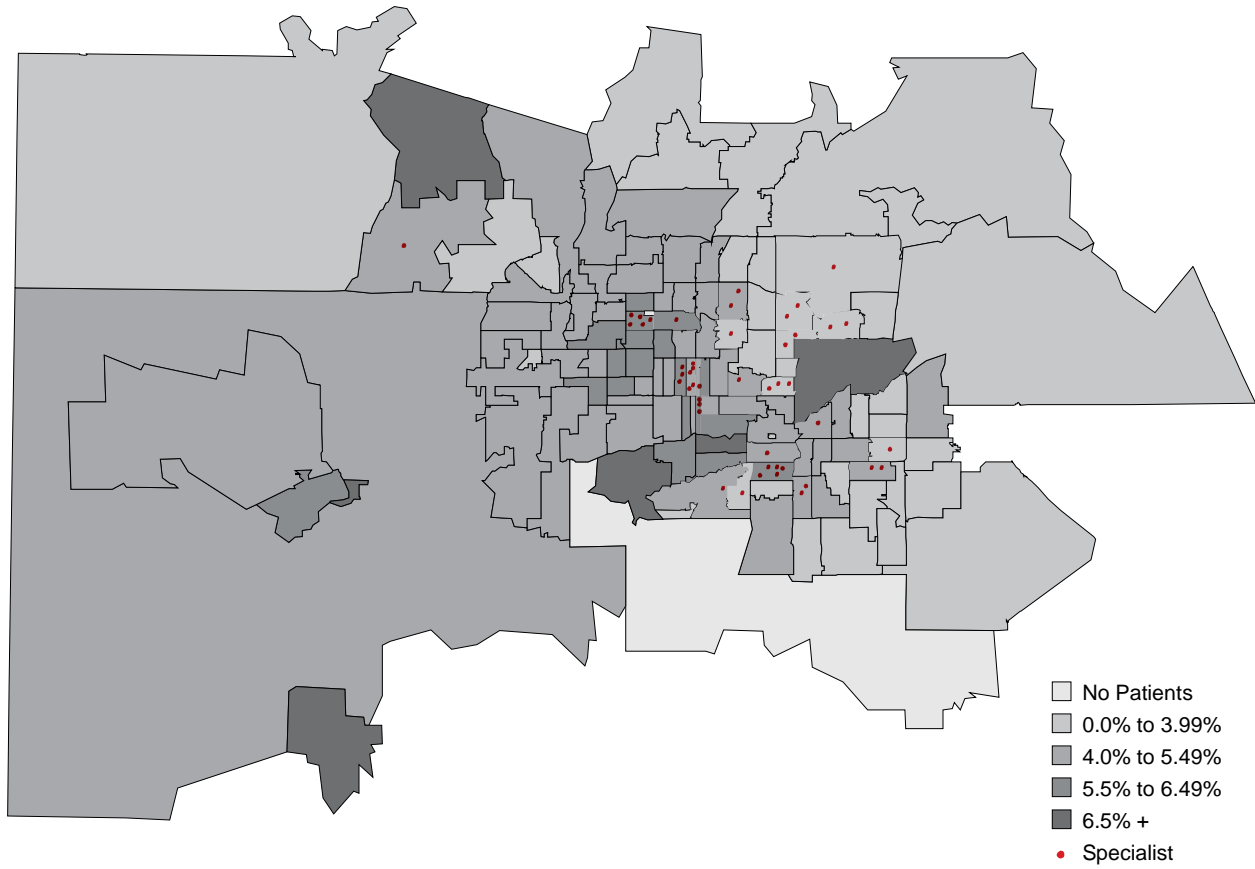
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.
 *Hispanic may be of any race. Single races are non-Hispanic

Figure 23— Number of Hospitalizations per Person with Asthma in Maricopa County by Insurance Status, 2003 (N = 56,271)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.
 *Public insurance includes AHCCCS and Medicare and other public insurers.
 **Public/Private includes individuals who had both private and public insurance during the year.

Figure 24— Geographic Distribution of Asthma in Maricopa County, 2003



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001—2003

Table 1— Demographic Characteristics of Zip Codes with the High and Low Rates of Asthma, 2003

| | <i>Average of Six Zip Codes with High Rates</i> | <i>Average of Six Zip Codes with Low Rates</i> |
|---------------------------------|---|--|
| <i>AZHQ Patients</i> | <i>N = 61,618</i> | <i>N = 39,121</i> |
| Number of Patients with Asthma | 3,996 | 937 |
| Asthma Rate | 6.5% | 2.4% |
| <i>2000 Census Demographics</i> | <i>N = 191,005</i> | <i>N = 134,563</i> |
| Percent Poverty | 15.5% | 3.5% |
| Percentage High School Graduate | 75.5% | 96.3% |
| Percent Black | 9.6% | 0.9% |
| Percent under 18 years | 31.0% | 21.6% |
| Zip Code Locations | 85040: E Broadway & 25th St 85256: Indian School & Country Club (Salt River Pima Maricopa Community) 85302: Olive & 55th Ave 85304: Cactus & 51st Ave 85339: Baseline & 51st Ave 85345: Grand & 67th Ave | 85253: Lincoln & Tatum 85255: Pima & Thompson Peak Parkway 85258: Via Linda & 87th St 85259: Shea & 120th St 85268: Fountain Hills 85331: Cave Creek & 56th St |

Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003. 2000 Census Demographic Profile, American Fact Finder

Note: Each zip code had a minimum of 500 patients utilizing care (denominator) in *AZHQ* in 2003. Percent of poverty, percentage of high school graduate, percent Black and percent under 18 represents the neighborhood using data from the Census and not necessarily the people with asthma in *AZHQ*.

Chronic Asthma in Maricopa County, 2001–2003

The second set of results highlights the health experiences of 5,062 people in Maricopa County with three consecutive years of data. These individuals received care for asthma at least once in all three years. Results for the longitudinal cohort are similar to the results from one year of data although the asthma rates are lower. For the longitudinal cohort, the chronic asthma rate in Maricopa County was 2% compared to 5% for the 2003 cohort. Children ages 10 to 14 had the highest rates of asthma at 4% (Figure 25) with adults over 65 and children younger than four years of age with the lowest rates at 1%.

The key findings regarding these patients who have chronic asthma are:

Blacks and American Indians had a higher rate of chronic asthma compared to other races and ethnicities (Figure 26).

Whites with chronic asthma had, on average, the highest number of ED visits per person (7.4) for all diagnoses but Blacks and American Indians with chronic asthma had the highest number of asthma related visits per person (1.6). Blacks with chronic asthma also had the highest percentage of total ED visits due to asthma – 31% of all ED visits for Blacks with chronic asthma were for asthma compared to 19% for Whites with chronic asthma (Figure 30).

Uninsured individuals with chronic asthma had, on average, the highest number of ED visits per person for all diagnoses (16.0 visits) and for visits with a diagnosis of asthma (3.7 visits). People with chronic asthma covered by public insurance had the lowest, an average of 4.2 per person for all diagnoses and 1.0 per person for visits with an asthma diagnosis (Figure 31).

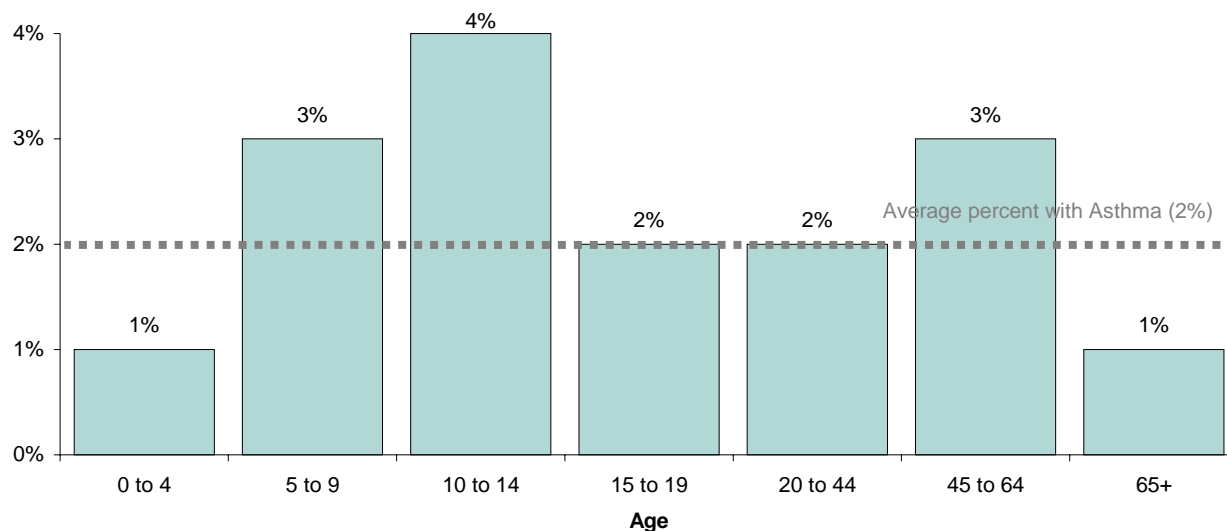
The uninsured with chronic asthma also had, on average, the highest number of hospitalizations (21.0) per person but the percentage of hospitalizations for asthma, 28%, was similar for individuals with chronic asthma who had public insurance at 30% (Figure 34).

Females with chronic asthma had more emergency room visits than males with chronic asthma for all diagnoses (Figure 28); for visits where the diagnosis is asthma, however, there is little difference by gender or by gender and age (Figure 29).

Females with chronic asthma also had on average more hospitalizations than males with chronic asthma but the percent of visits that were asthma related were higher for males

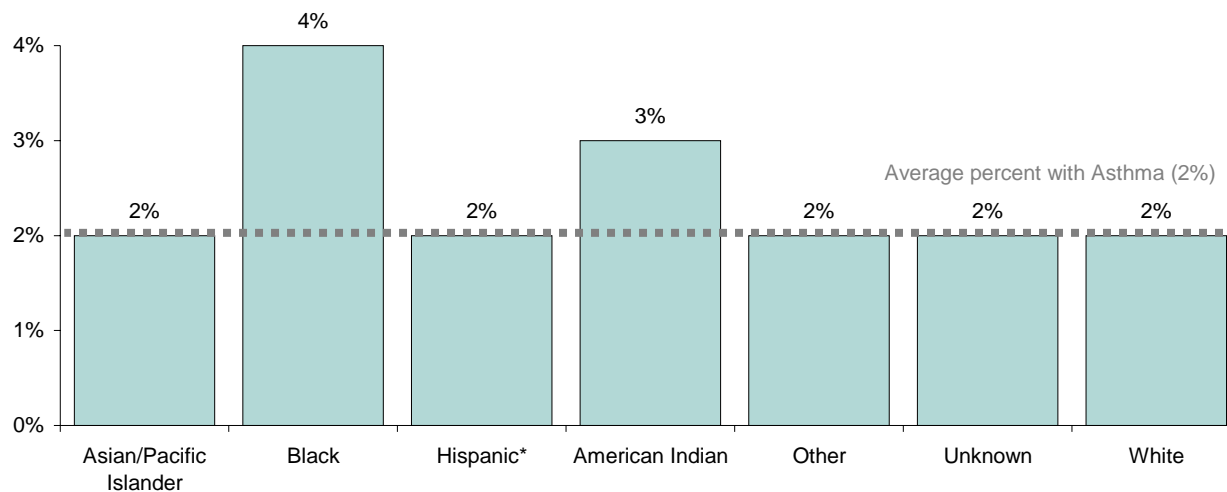
(Figure 32), 36% of all hospitalizations for males with chronic asthma were asthma related compared to 26% for females with chronic asthma.

Figure 25— Chronic Asthma Rates in Maricopa County by Age, 2001-2003 (N = 221,000)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001-2003
 Note: Total number with asthma = 5,062

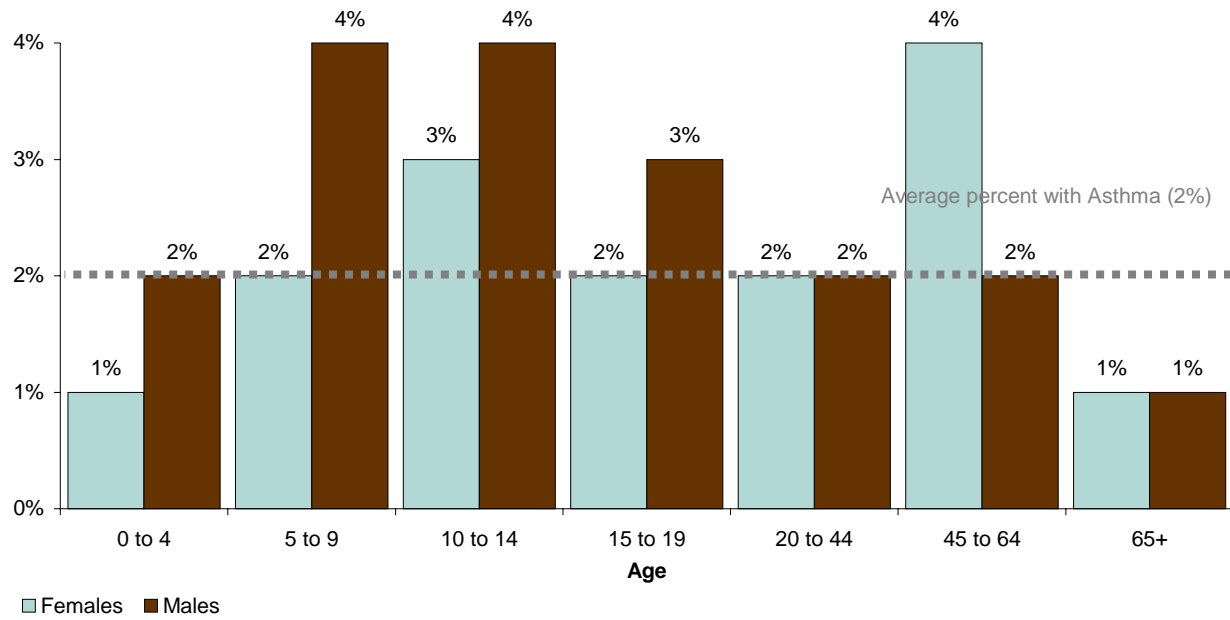
Figure 26— Chronic Asthma Rates in Maricopa County by Race/Ethnicity, 2001-2003 (N = 221,000)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001-2003
 Note: Total number with asthma = 5,062

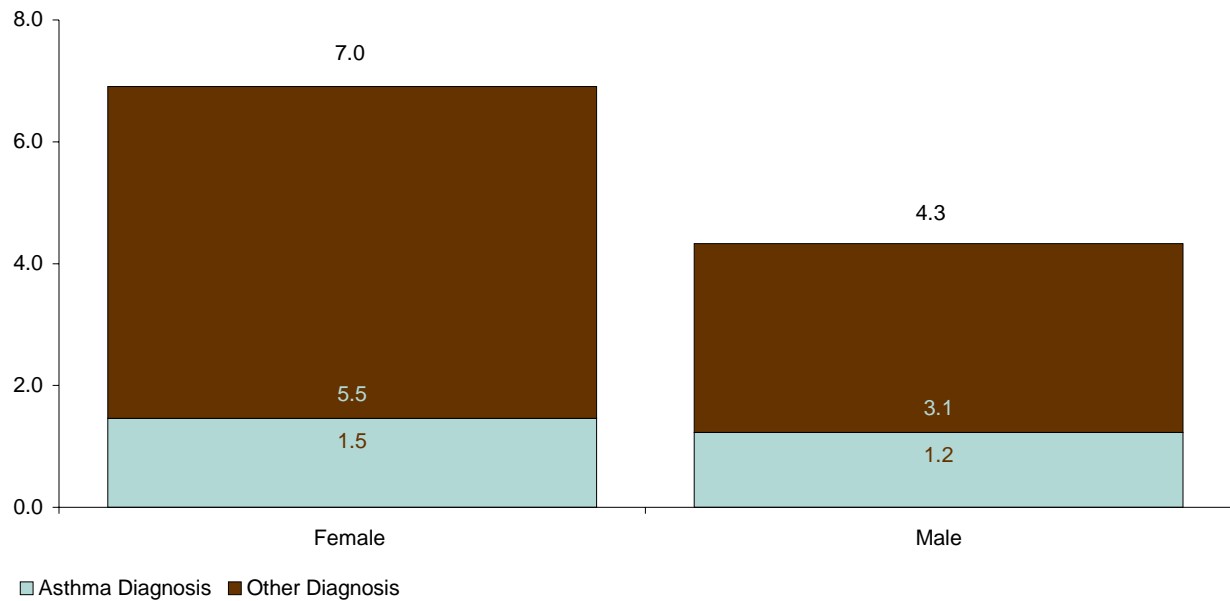
*Hispanic may be of any race. Single races are non-Hispanic.

Figure 27— Chronic Asthma Rates in Maricopa County by Gender and Age Group, 2001-2003
(N = 221,000)



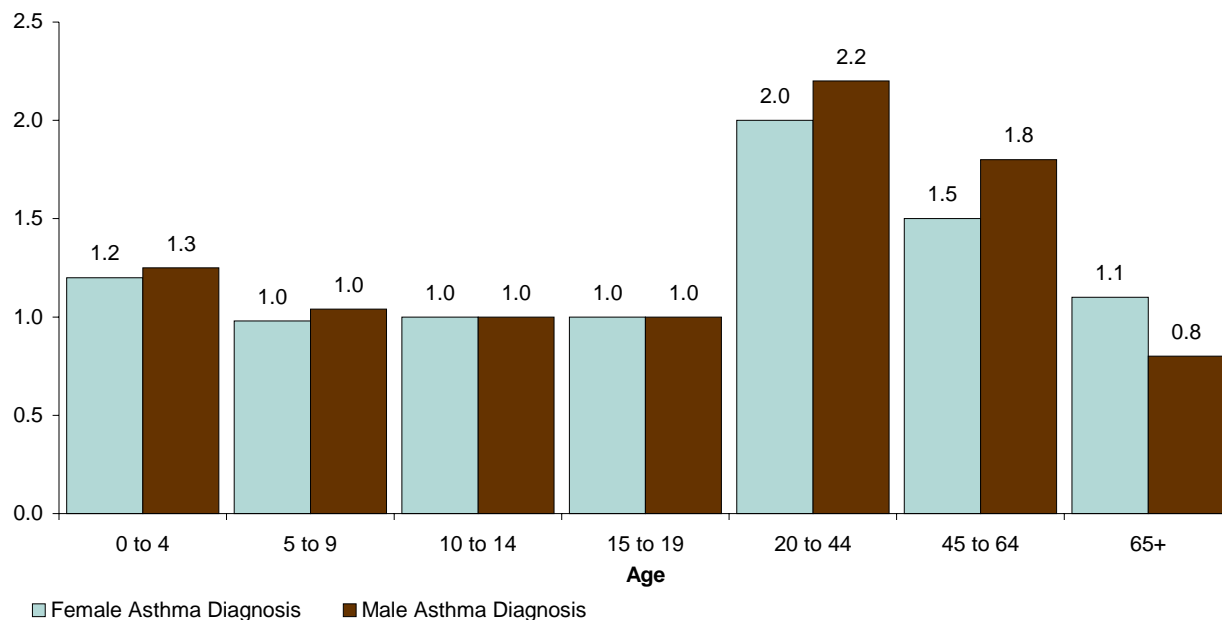
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001-2003
 Note: Total number with asthma = 5,062; female chronic asthma rate = 2%; male chronic asthma rate = 3%

Figure 28— Number of ED Visits per Person with Chronic Asthma in Maricopa County by Gender, 2001-2003
(N = 5,062)



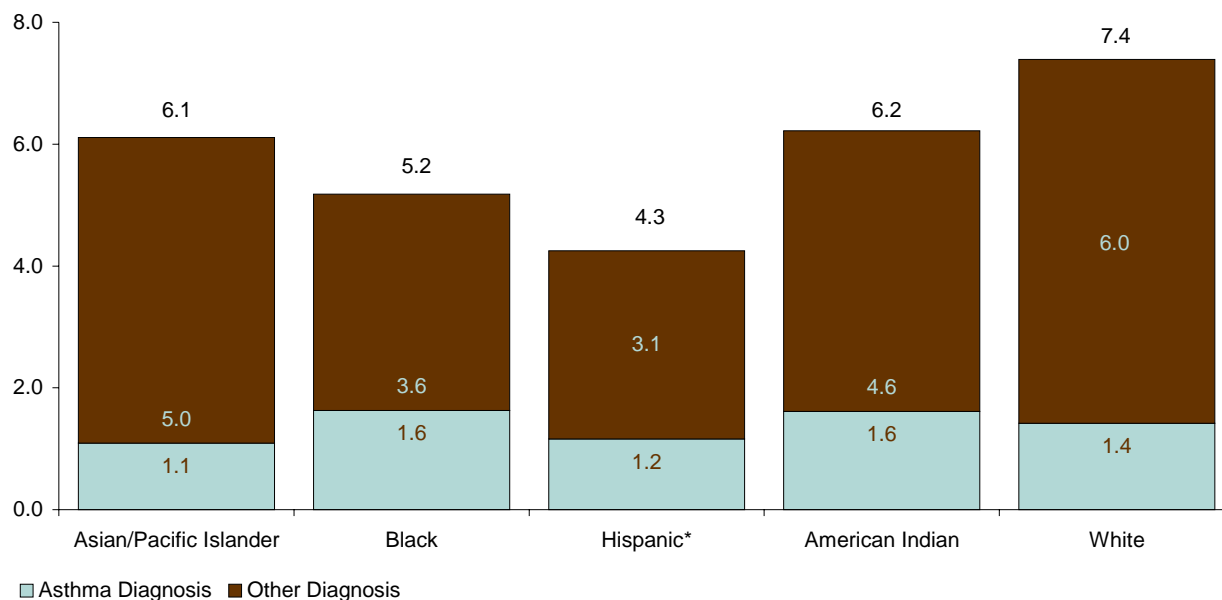
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001-2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.

Figure 29— Number of Asthma ED Visits per Person with Chronic Asthma in Maricopa County by Gender and Age, 2001-2003 (N = 5,062)



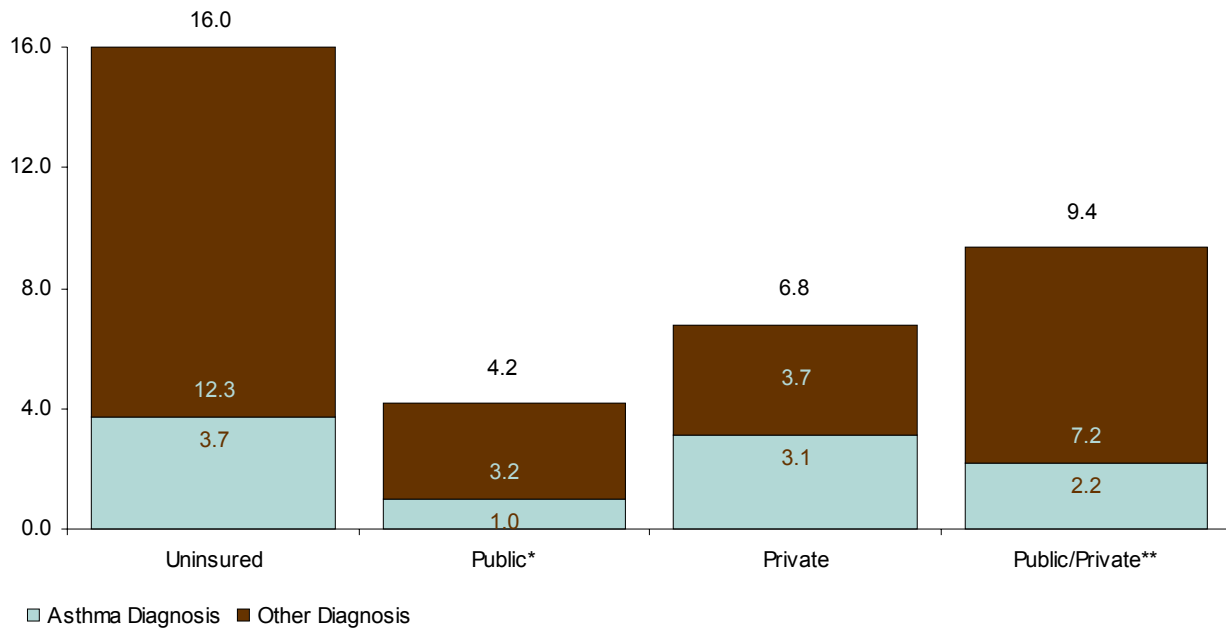
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001 – 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group.

Figure 30— Number of ED Visits per Person with Chronic Asthma in Maricopa County by Race/Ethnicity, 2001-2003 (N = 5,062)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group; other and unknown race/ethnicity is not shown as the number of patients is less than 30
 *Hispanic may be of any race. Single races are non-Hispanic.

Figure 31— Number of ED Visits per Person with Chronic Asthma in Maricopa County by Insurance Status, 2001-2003 (N = 5,062)



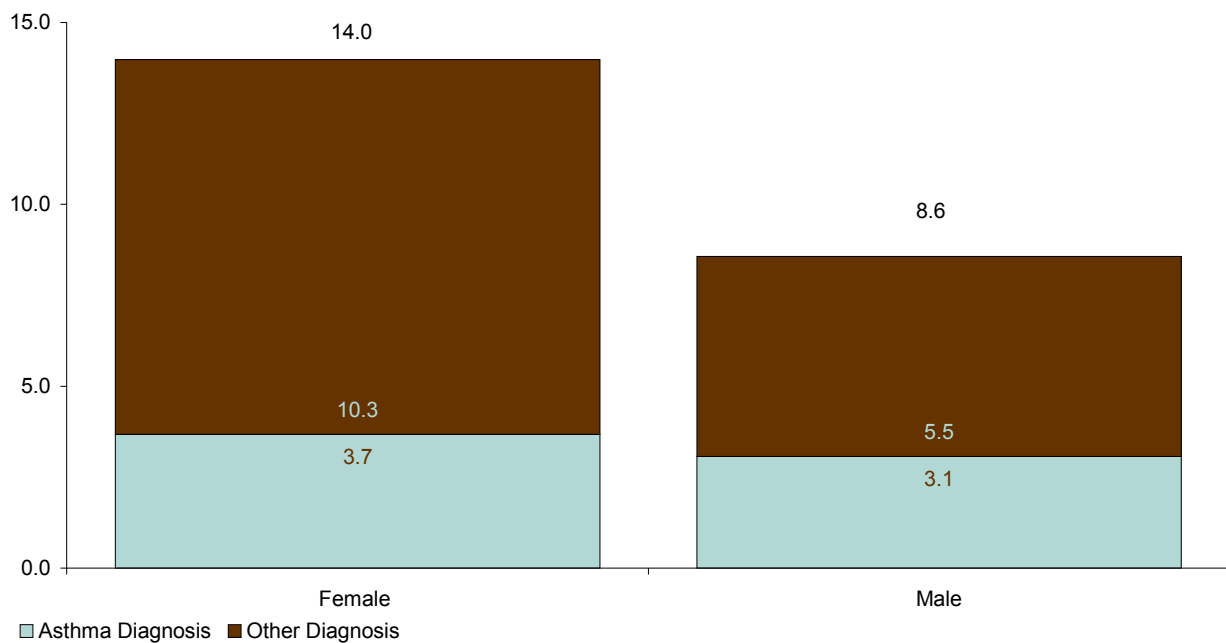
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001–2003

Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group; the average number of visits for other insurance is not shown as the number of patients was fewer than 10

*Public insurance includes AHCCCS and Medicare and other public insurers.

**Public/Private includes individuals who had both private and public insurance during the year.

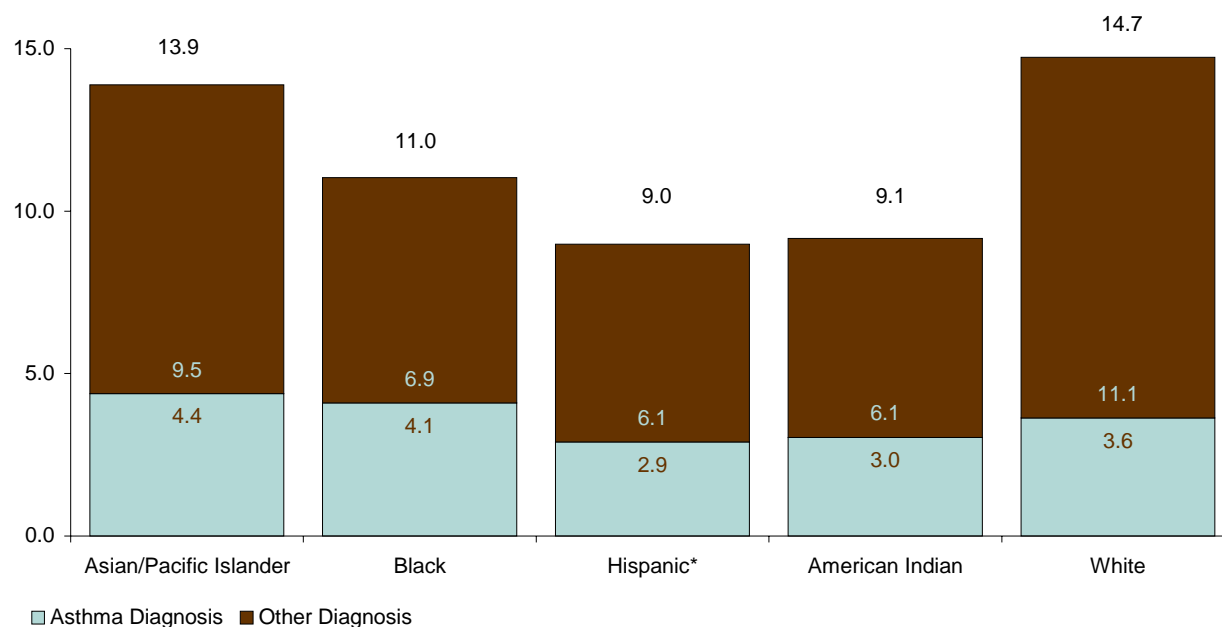
Figure 32— Number of Hospitalizations per Person with Chronic Asthma in Maricopa County by Gender, 2001-2003 (N = 5,062)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001–2003

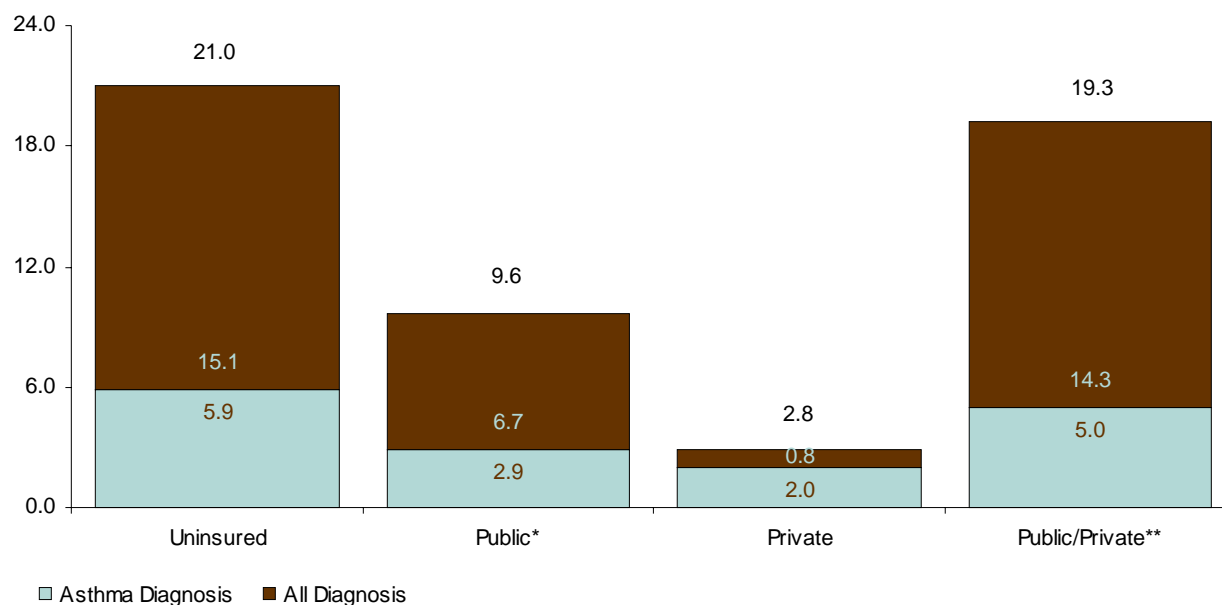
Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group; female chronic asthma rate = 2%; male chronic asthma rate = 3%

Figure 33— Number of Hospitalizations per Person with Chronic Asthma in Maricopa County by Race/Ethnicity, 2001- 2003 (N = 5,062)



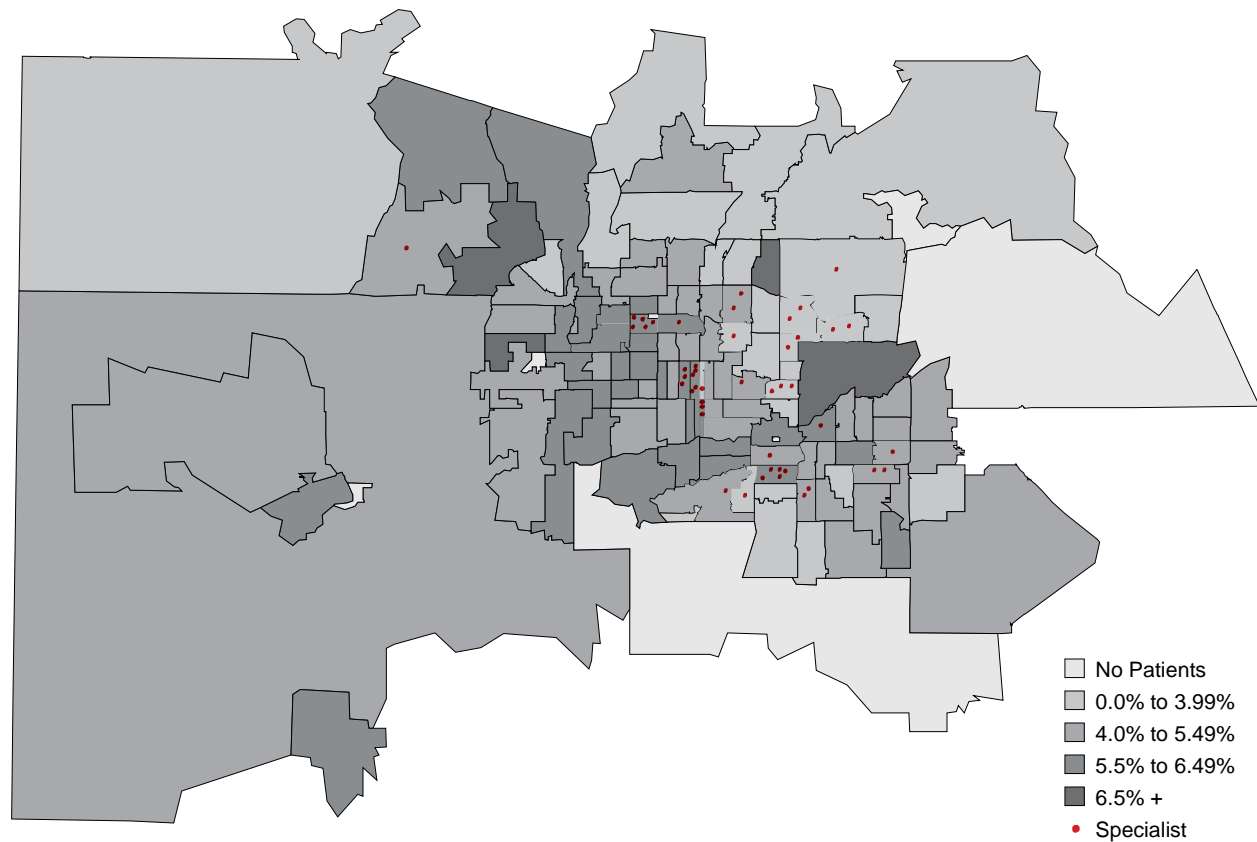
Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group; other and unknown race/ethnicity not shown since the number of patients is fewer than 30
 *Hispanic may be of any race. Single races are non-Hispanic.

Figure 34— Number of Hospitalizations per Person with Chronic Asthma in Maricopa County by Insurance Status, 2001-2003 (N = 5,062)



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001 – 2003
 Note: The denominator is the number of people with asthma in each group; numerator is number of visits for the group; the average number of hospitalizations for other insurance not shown since the number of patients was fewer than 10
 *Public insurance includes AHCCCS and Medicare and other public insurers.
 **Public/Private includes individuals who had both private and public insurance during the year.

Figure 35— Geographic Distribution of Chronic Asthma, Maricopa County, 2001–2003



Source: *Arizona HealthQuery* database; children and adults residing in Maricopa County, 2001–2003

Asthma Related Mortality in Maricopa County, 2000–2004

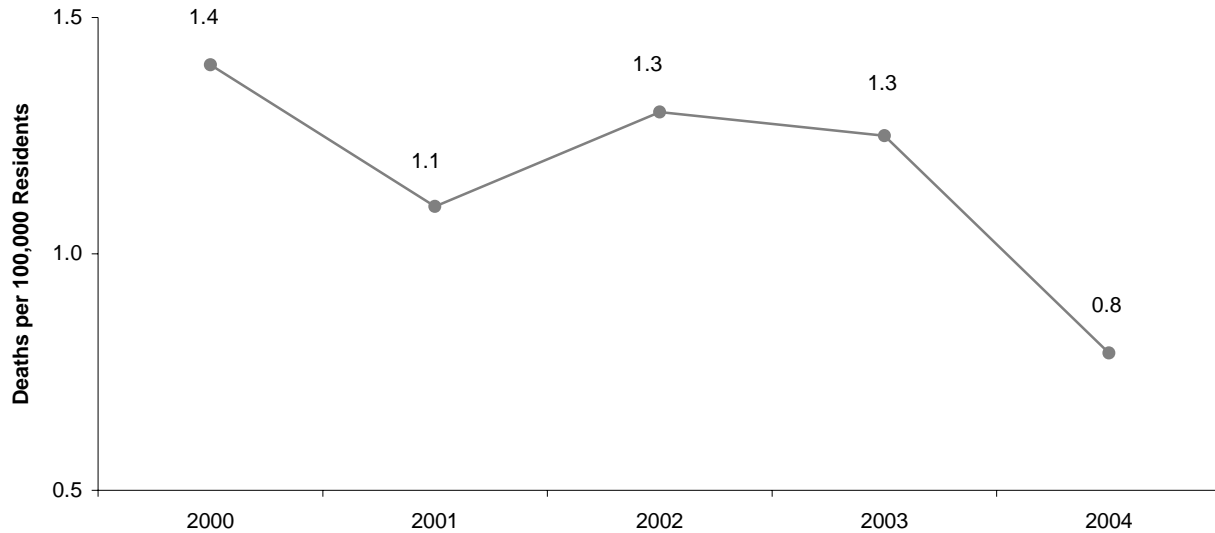
In Maricopa County, for the years 2000-2004, approximately 37 deaths per year were attributable to asthma (ICD10 J45), according to *AZHQ*. The rate of death from asthma decreased from 1.4 deaths per 100,000 residents in 2000 to 0.8 per 100,000 residents in 2004 (Figure 36). Mortality from asthma reflects a rare and severe outcome and therefore the reduction of deaths from asthma is one of the Healthy People 2010⁵ goals. In 2004, Maricopa County reached the Healthy People 2010 goal for asthma deaths for all age groups⁶ (Figure 37). Mortality from asthma is higher in some areas of Maricopa County than in others (Figure 38) but, for the three zip codes with the highest number of deaths, almost all deaths occurred in individuals over the age of 65. Fifty-two percent of asthma related deaths in the four year period were for people over age 65 and less than 5% of deaths were for people under age 19. The zip code with the highest number (10) of deaths, 85205, is located in Mesa and has an older population in

⁵ Healthy People 2010 is a national initiative designed to promote health and prevent disease.

⁶ Rates based on small numbers are imprecise and for people under age 34, there were fewer than five deaths attributable to asthma in any one year.

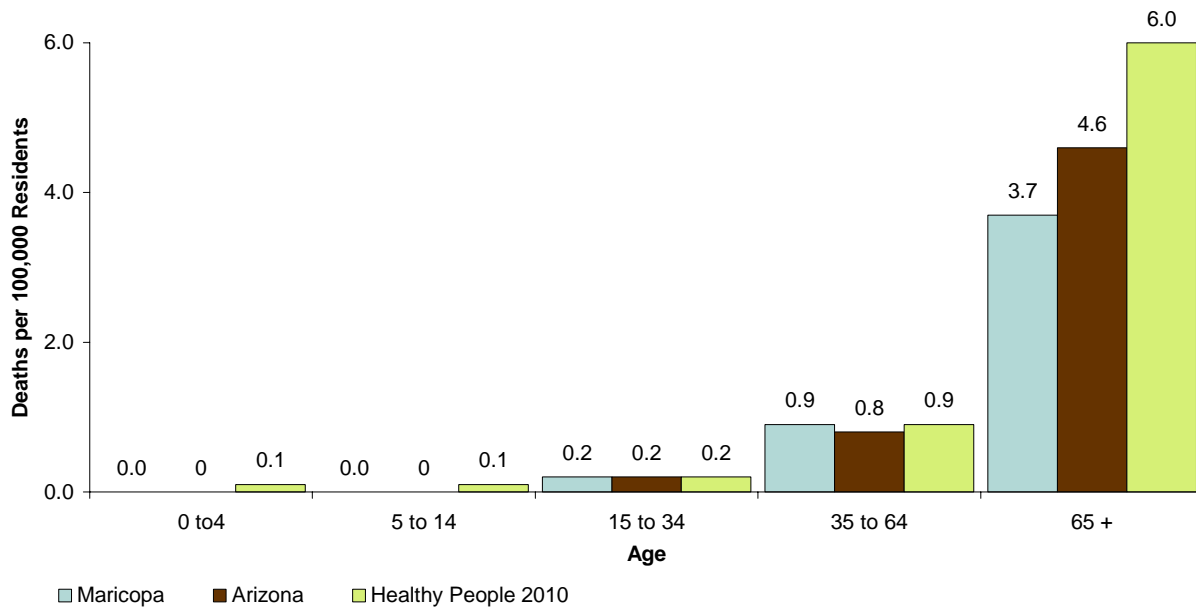
comparison to Maricopa County. The median age in zip code 85205 is 43.0 compared to 34.2 in Maricopa County and 26.2% of the population is over 65 compared to 11.7% in Maricopa County. The next two zip codes with the highest number of deaths (7 deaths each) are both located in Sun City, where over 79% of the population is over age 65.

Figure 36— Asthma Death Rates by Year, Maricopa County, 2000-2004



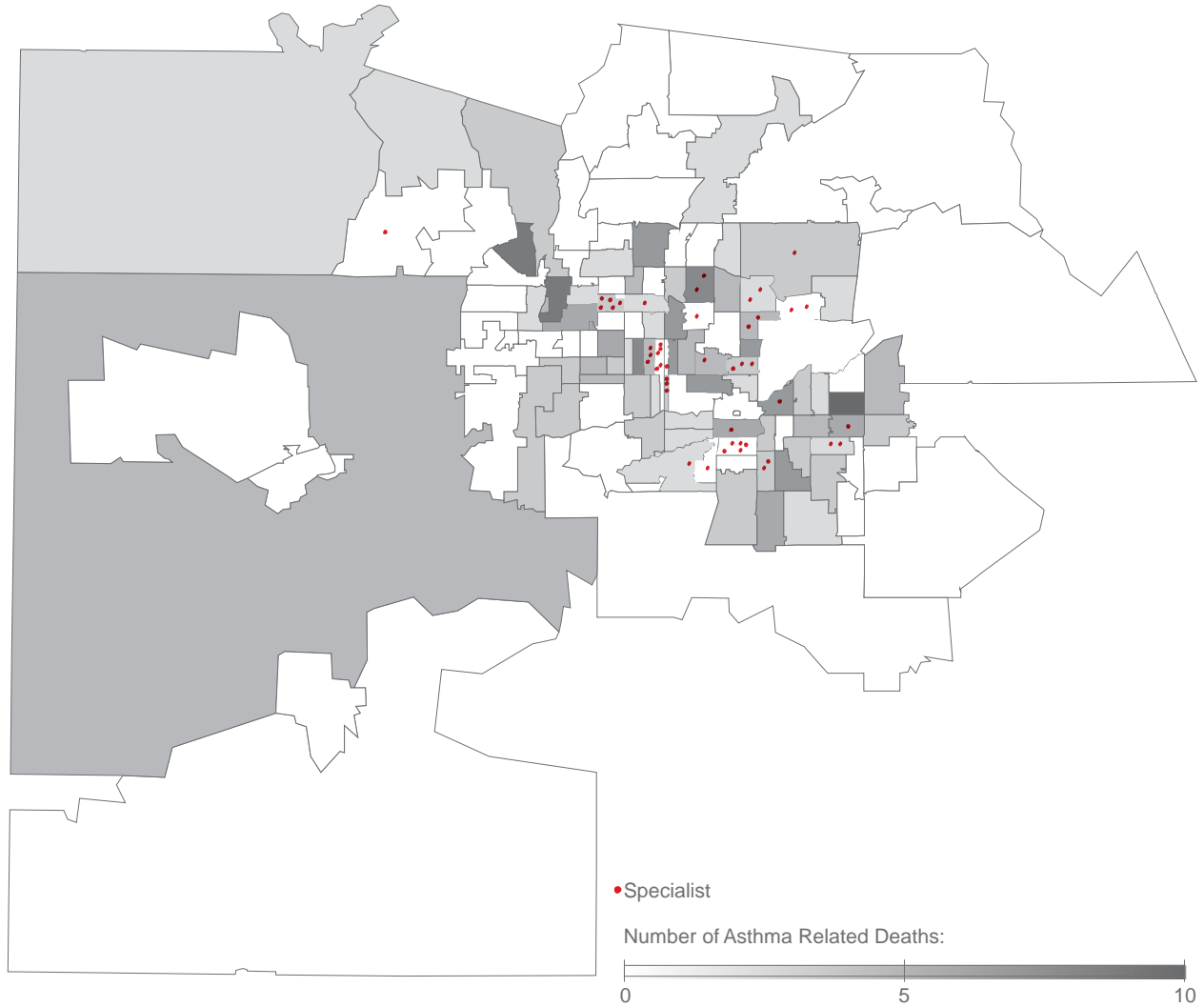
Source: *Arizona HealthQuery* database, 2000–2004, and population denominators used in calculation of rates from Arizona Department of Health Services, <http://www.azdhs.gov/plan/report/ahs/index.htm> [16]

Figure 37— Asthma Death Rates and Healthy People 2010 Goal by Age Group, Maricopa County, 2004



Source: *Arizona HealthQuery* database, 2000–2004, and population denominators used in calculation of rates from Arizona Department of Health Services, <http://www.azdhs.gov/plan/report/ahs/index.htm>. [16]

Figure 38— Map of Asthma Deaths in Maricopa County, 2000-2004



Source: *Arizona HealthQuery* database; 2000-2004.

Summary

Asthma is a major health problem in Maricopa County. Approximately 8% of adults in Maricopa County currently have asthma. The *AZHQ* database includes over 56,000 adults and children who required health care for asthma in 2003 (approximately 5% of the *AZHQ* database). Approximately 37 deaths per year from 2000-2004 were attributable to asthma; however, the death rate from asthma has declined from 1.4/100,000 to 0.8/100,000 from 2000 to 2004. In Maricopa County, Blacks and American Indians have the highest rate of asthma and Hispanics have the lowest asthma rates. Blacks and American Indians with asthma also have higher number of ED visits per person for asthma than other racial/ethnic groups. Approximately one-third of all ED visits for Blacks who have chronic asthma is for asthma-related disease, averaging 1.6 visits per person over a three year period.

National studies show that asthma is more prevalent among Blacks, children, and individuals with lower socioeconomic status. In Maricopa County, asthma rates are higher for children ages 5 to 14 years old than other age groups. This age group is more likely to be playing outside and, thus, exposed to air pollutants and allergens than other age groups. Additionally, we found that asthma rates varied by zip code in Maricopa County. On further analysis, we found that the zip codes with the highest asthma rates had a higher percentage of children younger than 18 years old, a higher percent of people living in poverty, and a higher percentage of Blacks than the zip codes with the lowest rates.

The majority of people who received health care for asthma in 2003 had public insurance (e.g., AHCCCS, Medicare); 9% were uninsured. The uninsured with asthma averaged one ED visit per person for asthma in 2003 compared to 0.3 ED visits per person for the publicly insured with asthma and 0.6 per person for the privately insured with asthma. The larger rate for the uninsured may be due to lack of access to preventive care services and controller medications which must be taken daily to prevent asthma attacks. The lower rate of ED visits for the publicly insured than for the privately insured suggests that AHCCCS is providing better preventive services for asthma patients than the private insurers. The highest rate of health care utilization for asthma was among people who were both publicly and privately insured in 2003. There are many reasons why this particular group may have utilized more health care services for their asthma than other insurance groups. Asthma is usually a chronic disease that requires frequent physician visits and daily medications. When patients switch insurers, they may not have access to timely preventive care services since they must locate a new medical provider who may not be as familiar with their health care needs and may lack adequate medical records because of delays in transfers of records from their previous provider. In addition, their treatment regimen may also be disrupted due to formulary changes and they may be less comfortable contacting their new physician when they are having difficulties with their asthma. Finally, their insurance coverage may be limited during the first few months after changing insurers so that they delay seeking preventive care services.

This report demonstrates the value of a community health database, *AZHQ*, in providing timely information on the health care of the community. We hope this report will assist data partners and other members of the health care community in the development of asthma outreach programs and assist them in targeting the racial, ethnic and age groups in greatest need of services. In addition, the report provides valuable information on the geographic areas with the highest prevalence of asthma which can be utilized not only for outreach programs but also for further research into the potential risk factors for asthma in these areas, including air pollution and allergen exposure.

References

1. Mannino, D.M., et al., Surveillance for asthma--United States, 1960-1995. *MMWR CDC Surveill Summ*, 1998. 47(1): p. 1-27.
2. Eggleston, P.A., et al., The environment and asthma in U.S. inner cities. *Environ Health Perspect*, 1999. 107 Suppl 3: p. 439-50.
3. National Center for Health Statistics, Asthma Prevalence, Health Care Use and Mortality, 2002 Fact Sheet. 2005.
4. Mannino, D.M., et al., Surveillance for asthma--United States, 1980-1999. *MMWR Surveill Summ*, 2002. 51(1): p. 1-13.
5. Weiss, K.B. and S.D. Sullivan, The health economics of asthma and rhinitis. I. Assessing the economic impact. *J Allergy Clin Immunol*, 2001. 107(1): p. 3-8.
6. Liu, A.H., J.D. Spahn, and D.Y.M. Leung, Childhood Asthma, in *Nelson textbook of pediatrics*, R.E. Behrman, R. Kliegman, and H.B. Jenson, Editors. 2004, Saunders: Philadelphia, Pa. p. xlviii, 2618 p., [8] p. of plates.
7. Ford, E.S., et al., Self-reported asthma and health-related quality of life: findings from the behavioral risk factor surveillance system. *Chest*, 2003. 123(1): p. 119-27.
8. Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System Survey Data, U.S. Department of Health and Human Services, Editor. 2003: Atlanta, GA.
9. Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System Survey Data, U.S. Department of Health and Human Services, Editor. 2004: Atlanta, GA.
10. Gold, D.R. and R. Wright, Population disparities in asthma. *Annu Rev Public Health*, 2005. 26: p. 89-113.
11. Carr, W., L. Zeitel, and K. Weiss, Variations in asthma hospitalizations and deaths in New York City. *Am J Public Health*, 1992. 82(1): p. 59-65.
12. Gwynn, R.C., Risk factors for asthma in US adults: results from the 2000 Behavioral Risk Factor Surveillance System. *J Asthma*, 2004. 41(1): p. 91-8.

13. Institute of Medicine (U.S.). Committee on the Assessment of Asthma and Indoor Air., Clearing the air: asthma and indoor air exposures. 2000, Washington, D.C.: National Academy Press. xvi, 438 p.
14. Miller, J.E., The effects of race/ethnicity and income on early childhood asthma prevalence and health care use. *Am J Public Health*, 2000. 90(3): p. 428-30.
15. U.S. Census Bureau. American Community Survey 2003 Data Profiles, Maricopa County, Arizona 2003 [cited 2005 December 15]; Available from:
<http://www.census.gov/acs/www/Products/Profiles/Single/2003/ACS/AZ.htm>.
16. Arizona Department of Health Services. Arizona Health Status and Vital Statistics, Chapter 10, Population Denominators, Arizona, Table 10B-1. 2000 - 2004 [cited 2006 January 17].

Appendix Table 1: Demographics of Maricopa County, 2003

| | <i>Maricopa County</i> | <i>Percent of Maricopa County</i> | <i>Percent of U.S.</i> |
|---|----------------------------|---------------------------------------|------------------------|
| Total Population | 3,444,478 | | 282,909,885 |
| <i>Gender</i> | | | |
| Male | 1,678,450 | 50.2% | 48.9% |
| Female | 1,666,028 | 49.8% | 51.1% |
| <i>Age Groups</i> | | | |
| 0 to 4 | 281,531 | 8.4% | 7.0% |
| 5 to 9 | 265,455 | 7.9% | 7.0% |
| 10 to 14 | 257,479 | 7.7% | 7.5% |
| 15 to 19 | 216,176 | 6.5% | 6.7% |
| 0 to 19 | 1,020,641 | 30.5% | 28.1% |
| 20 to 44 | 1,262,635 | 37.8% | 35.9% |
| 45 to 64 | 690,334 | 20.6% | 24.0% |
| 65 + | 370,868 | 11.1% | 12.0% |
| <i>Race/Ethnicity</i> | | | |
| White | 2,103,494 | 62.9% | 67.8% |
| Black or African American | 122,453 | 3.7% | 11.9% |
| American Indian and Alaska Native | 54,172 | 1.6% | 0.7% |
| Asian or Pacific Islander | 86,960 | 2.6% | 4.2% |
| Other | 38,008 | 1.1% | 1.6% |
| Hispanic* | 939,391 | 28.1% | 13.9% |
| <i>Language spoken at home (5 years and over)</i> | | | |
| English Only | 2,303,080 | 75.2% | 81.6% |
| Spanish | 614,555 | 20.1% | 11.3% |
| Other | 145,312 | 4.7% | 7.1% |
| <i>Employment Status (civilian labor force)</i> | | | |
| Civilian Labor Force Unemployed | 120,315 | 7.3% | 7.6% |
| <i>Percentage below poverty level</i> | | | |
| <i>Individuals</i> | | | |
| 18 years and older | | 11.4% | 11.0% |
| 65 years and older | | 6.0% | 9.8% |
| Children under 18 years | | 18.2% | 17.7% |
| <i>Families</i> | | | |
| All families | | 9.6% | 9.8% |
| Married couple families | | 5.5% | 4.8% |
| Married couple families with related children under 5 | | 9.6% | 6.2% |
| Female householder families | | 25.6% | 28.3% |
| Female householder families with related children under 5 | | 45.5% | 46.5% |
| <i>Households</i> | | | |
| Female Householder, no husband present | 147,748 | 12.0% | 12.6% |

Source: U.S. Census Bureau, American Community Survey 2003, Maricopa County and U.S. Estimates

*Hispanic may be of any race. Single races are non-Hispanic. Other race includes non-Hispanic some other race alone and two or more races.