



# Health Insurance in Arizona

## The Children of Yuma County 1999-2004

A report to the Community from  ARIZONA HEALTHQUERY  
a Community - University Partnership

CHIR

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### **The Children of Yuma County 1999-2004**

is the sixth in a series of Community Reports published by the Center for Health Information & Research (CHIR). These reports are designed to inform our data partners and our community about health and health care utilization in Arizona. If you have a topic you would like us to consider for a future Community Report, email us at [chir@asu.edu](mailto:chir@asu.edu).

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## Introduction

Americans who lack health insurance are at risk for poor health because of limited access to care (Institute of Medicine [IOM], 2006). These limitations are likely to have their greatest impact on preventive care. The importance of early intervention and preventive care for children has led to attempts, notably the State Children's Health Insurance Program (SCHIP), to increase health insurance coverage for children. The efforts to establish realistic targets for SCHIP and other public policy approaches to health insurance have, however, been dogged by a dearth of reliable information on the numbers of uninsured children.

The lack of adequate information is especially severe for localities because national survey data are not designed to produce reliable estimates for small geographic areas. Many states have attempted to solve the problem by introducing statewide surveys (Call, Davern, & Blewett, 2007). This report takes a different approach—it shows how a community can pool its existing data to create a rich source of information that can be used not only to count uninsured children but also to track their use of health care and the nature of the conditions for which care is provided.

Arizona HealthQuery (AZHQ) is a community health data system created by the voluntary cooperation of employers, private and public health care insurers, health care providers, and health related public organizations. The first five years of funding were provided by the Flinn Foundation. Subsequent sponsorship by St. Luke's Health Initiatives and Arizona State University (ASU) has permitted Arizona HealthQuery to expand to include more than eight million individuals drawn from more than sixty data partners ranging from individual physician practices to Arizona's Medicaid and SCHIP plans (Arizona Health Care Cost Containment System or AHCCCS). Coverage, although not yet complete, extends to all parts of the state of Arizona. AZHQ data partners retain ownership of their data but permit it to be used by ASU, under strict confidentiality rules of 1996's Health Insurance Portability and Accountability Act (HIPAA), to serve the community by providing aggregated data on the health, health care, and health insurance of members of the community.

AZHQ began as a demonstration project in Yuma County in 1998. Yuma County is a thinly populated area of more than 5,000 square miles bordered by California to the west and Sonora, Mexico, to the south. Yuma's health care system is more or less self-contained, located approximately 200 miles from any large city.<sup>1</sup> Yuma is home to a United States (U.S.) Marine Corps airbase, but most of Yuma's workforce is employed in agriculture and related support activities.

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<sup>1</sup> San Diego is 170 miles, Phoenix is 190 miles, and Tucson is 240 miles.

The county was home to slightly fewer than 60,000 children in 2004 (United States [U.S.] Census, 2005). The population of children increased by nearly 50% between 1990 and 2000 and continues to grow. The proportion of children who are Hispanic increased from approximately 40% in 1990 to nearly 70% in 2004 (U.S. Census Bureau, 2000, 2005).

This report describes the health insurance coverage of Yuma’s children in 1999 and compares it to their coverage in 2004.<sup>2</sup> The term “insurance coverage” in this report refers to the proportion or number of people with health insurance rather than the scope of coverage within health insurance policies. The results include rates of health insurance coverage and the characteristics of insured and uninsured children. The estimated rates from the AZHQ data are compared to estimates from the U.S. Current Population Survey (CPS).

## **The Data**

The 1999 dataset<sup>3</sup> included 30,504 children, representing approximately 64% of all the children in Yuma County. Missing data on insurance status reduced the dataset to 28,719 children who are the basis for the AZHQ estimates of insured and uninsured children in 1999. The data include several thousand children for whom we have insurance enrollment data even though they did not utilize health care in 1999. The data required for the mandatory admissions data necessarily excludes those who did not use health care, reducing the data to 21,820 children in 1999 (46% of the children living in Yuma County). The 2004 data include 43,776 children or approximately 76% of the children of Yuma County in that year (Table 1). Our analysis for 2004 is based on data for 40,629 children who used health care and whose insurance status was identified or approximately 71% of the population of children living in Yuma County. The increase in the size of the dataset between 1999 and 2004 reflects both the rapid population growth in Yuma county and expansion in the scope of AZHQ coverage.

To determine the likely impact of the omitted children on our estimates, we compared Census data on the population of children in Yuma County to the characteristics of the children in the AZHQ database. A comparison of the age distribution of children in AZHQ to the age distribution of the population of Yuma County children data provides a profile of the omitted children. In 1999, approximately 92% of all children in the 0 – 4 age group were included in AZHQ, 58% of all children in the 5 – 9 age group were included, 48% of children age 10 – 14 were included, and approximately 41% of children age 15 – 19 were included (Table 1).

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<sup>2</sup> The 1999 data were originally reported in *The Yuma Project on Uninsured Children* (Johnson, Johnson, Marcus, Bartels, & Lawthers, 2001) published by the Flinn Foundation.

<sup>3</sup> In 1999, the database was known as a Community Health Data System or CHDS. It was later incorporated into the relational database now known as Arizona HealthQuery or AZHQ.

The 2004 data include a higher percentage of Yuma’s children in all age groups. The number of children in the 0 – 4 age group in 2004 is higher than the Census estimates. The census data are based on a July 2004 “snapshot” of the population of Yuma, while the AZHQ data include 12 months and Yuma is a relatively small geographic area with rapid population growth. Since every infant born at YRMC, the county’s only hospital, is included in the dataset, it is not surprising that our 0 – 4 numbers are higher than the Census counts.

**Table 1. AZHQ Coverage and U.S. Census Bureau Estimates of Children in Yuma, 1999 & 2004**

Data Source (Year)	Total	Age Groups			
		0 – 4	5 – 9	10 – 14	15 – 19
AZHQ (2004)	40,629 (71% of Census)	17,205 (111% of Census)	8,671 (63%)	7,746 (53%)	7,007 (51%)
U.S. Census (2004 Estimates)	57,497 (100%)	15,522	13,736	14,529	13,710
AZHQ (1999)*	28,719 (61% of Census)	11,464 (92% of Census)	7,208 (58%)	5,542 (48%)	4,503 (41%)
U.S. Census (1999 Estimates <sup>4</sup> )	47,417 (100%)	12,461	12,427	11,546	10,983

Sources: AZHQ, 1999 & 2004; U.S. Census Bureau, 2000 & 2005.

\*Note: Numbers may not sum to total due to rounding.

The U.S. Census Bureau annually estimates the number and characteristics of children in Yuma County in the years between the decennial Censuses. The Census Bureau estimated that there were 47,417 children age 0 – 19 in Yuma County in 1999. Sixty-one percent (n = 28,922) of the children were Hispanic; 32% (n = 15,005) were White, non-Hispanic; and slightly less than 4% (n = 1,732) were Black or African-American (Figure 1; U.S. Census, 2000).

The 1999 estimates that we used in our previous report (*The Yuma Project on Uninsured Children*, 2001) were revised by the Census Bureau in the year 2000. The original estimates are used in this report. The differences between the estimates from the original and revised population estimates are reported in Appendix Table 1 in the Technical Notes.

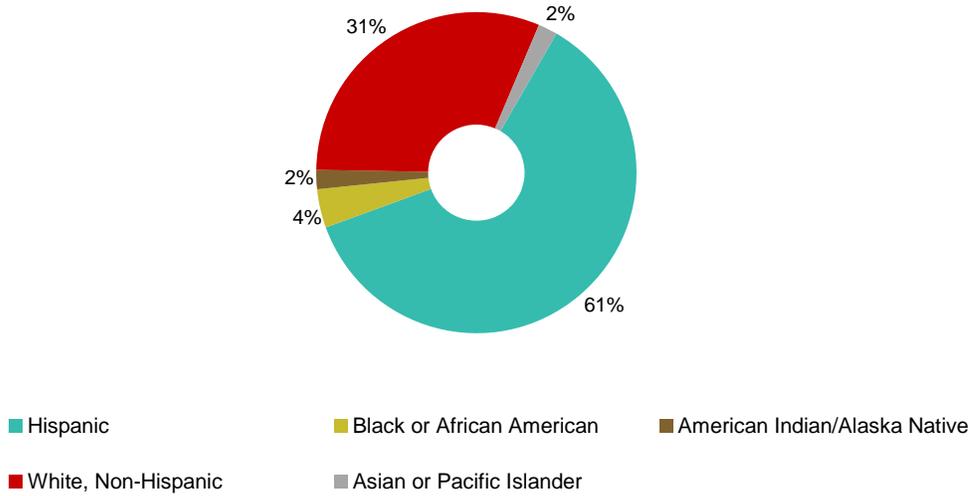
In 2004, the Census Bureau estimated that there were 57,497 children age 0 – 19 in Yuma County, a 21% increase from its 1999 estimate. The number of Hispanic children increased by almost 45% (n =

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<sup>4</sup> The census estimates for 1999 were revised following the decennial census in 2000 (<http://www.census.gov/popest/estimates.php>), but these revised estimates were not used in this report. A comparison of the estimates is included in Appendix B.

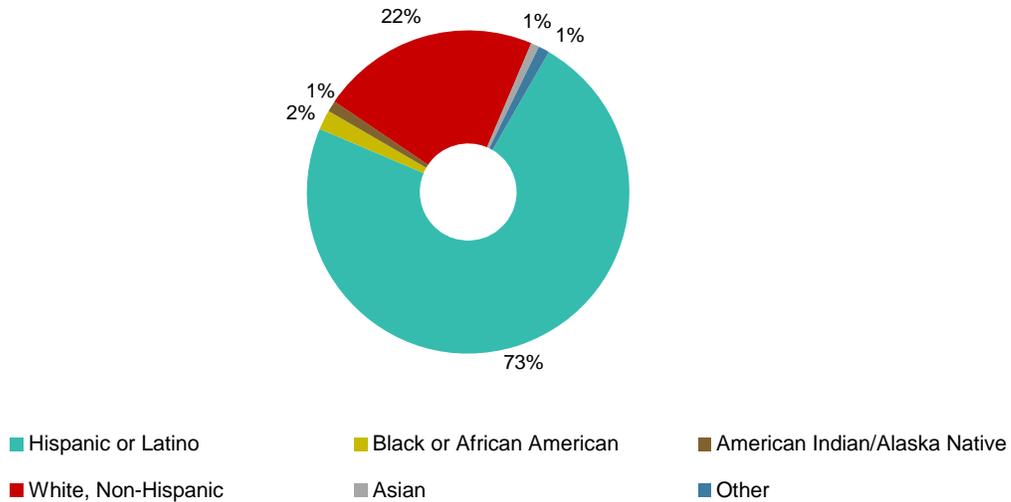
41,969), while the number of White, non-Hispanic children decreased by just over 14% (n = 12,890), and Black or African American children decreased in number by more than 47% (n = 921; Figure 2).

Figure 1: Yuma County Children by Race and Ethnicity, 1999 (N = 47,417)



Source: U.S. Census Bureau, 2000.  
 Note: Hispanic may be of any race.

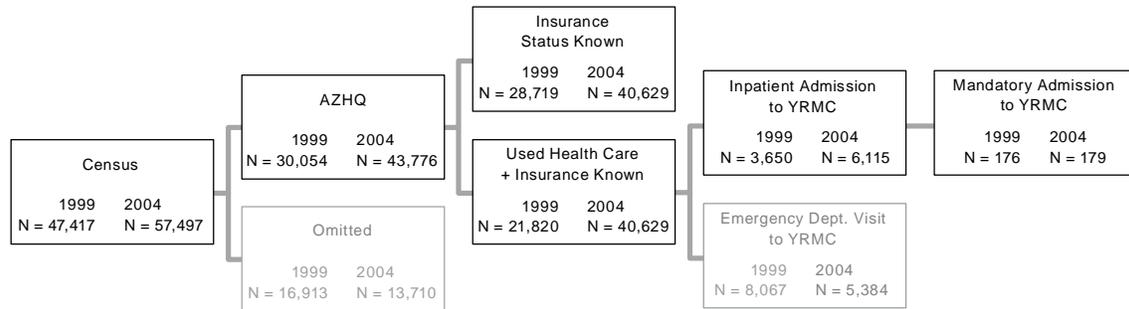
Figure 2: Yuma County Children by Race and Ethnicity, 2004 (N = 57,497)



Source: U.S. Census Bureau, 2005.  
 Note: Hispanic or Latino may be of any race. Other includes Native Hawaiian and Other Pacific Islander and Two or More Races. The 2004 race and ethnicity statistics are reported in revised categories after revisions in the 2000 decennial census.

Different subsets of the data are used for different sections of this report. Figure 3 is designed to help the reader identify the data used in each section of the report. This figure is repeated later in the report when the dataset used for our analysis changes. The dataset in use for the section in question is highlighted.

Figure 3: Datasets Used in This Report



Sources: AZHQ, 1999, 2004; U.S. Census Bureau, 2000, 2005.

Note: 2004 AZHQ counts are unduplicated. In 1999, ED visit counts—rather than people counts—were used.

The results on health care utilization are based on children who used health care services during 1999 or 2004 *and* whose health insurance status was recorded. The 1999 data include 21,820 children, of which 3,650 children were admitted for inpatient care to Yuma Regional Medical Center (YRMC). The 2004 data include 40,629 children, including 6,115 children who were admitted for inpatient care and 5,384 children who visited the emergency department (ED).<sup>5</sup>

In both 1999 and 2004, we counted the number of children who had a mandatory admission to YRMC. The term *mandatory admissions* refers to hospitalizations that are required by the nature or severity of an illness or injury. A more detailed description is presented in a subsequent section.

<sup>5</sup>ED visits and all other health care services were counted differently in the two years. In 2004, we counted individuals, or children, using the ED, rather than (as in 1999) the number of ED visits. We also counted the number of children using other health care services in 2004, rather than the number of services used (1999).

## Estimating the Number of Uninsured Children

Insurance status is defined as follows:

- 1) *Insured*: children who were insured for each encounter in the reference year (e.g., 1999 or 2004);
- 2) *Uninsured*: children who had at least one uninsured encounter during 1999 or 2004.

Rates of health insurance coverage<sup>6</sup> are estimated by assuming that children in group one are *insured* and others are *uninsured* in the year from which the data are obtained. This definition inflates our estimates of uninsured children since children with dual insurance status account for slightly less than one-half of the total count of uninsured children. Other assumptions, detailed in a subsequent section, may have opposing effects.

Our estimates are based on the insurance status of a child in the reported year. In other words, a child who was *insured* in 1999 and counted as such could be either *insured* or *uninsured* in 2004. The data on which these results are based are not, therefore, composed of the same children in both years although there are substantial overlaps; the results should be interpreted as cross-sectional estimates based on children found in the AZHQ database in either or both years, 1999 and 2004.<sup>7</sup>

Four alternative estimates of insurance coverage are reported to establish a reasonable range of possible results. The four estimates are:

- rates from the AZHQ database,
- rates from the AZHQ database applied to the population of children in Yuma County,
- rates of insurance coverage for patients who were mandatory admissions applied to the population of children, and
- estimates of rates of insurance coverage from the U.S. Current Population Survey.

The first method calculates health insurance coverage from the children in AZHQ. The second applies age-specific rates of insurance coverage from the AZHQ data to the numbers of children in the respective age groups in the Yuma County population. The second method effectively treats the

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<sup>6</sup> The term “insurance coverage” in this report refers to the proportion or number of people with health insurance rather than the scope of coverage within health insurance policies.

<sup>7</sup> A study of patterns of insurance coverage over several years for a fixed cohort of children in Yuma County is being conducted by the authors as part of an NIH-sponsored study at the Center for Health Information & Research at ASU.

AZHQ data as a sample of the larger population. AZHQ includes, of course, a proportion of the population that is several magnitudes greater than a sample derived in the usual way.

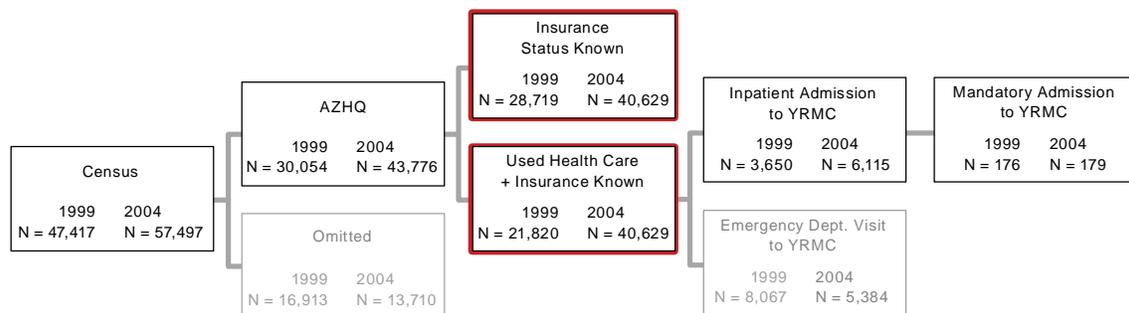
The third method records the proportion of insured children in each age group who are admitted for health conditions for which inpatient care is mandatory (See Technical Notes, Appendix Table 2.) The observed proportions for the admitted cohort are assumed to represent the proportion of children who are insured in the population of Yuma County children in that age group, and the age-specific rates of insurance coverage are applied to the total population of Yuma children in the respective age group. The method is described in detail in a subsequent section.

Lastly, the two estimates from the AZHQ data are then compared to the estimated number of uninsured children in Yuma County calculated from the 1999 and 2004 CPS.

### AZHQ Estimates

The AZHQ estimates are based on approximately 61% of Yuma County’s children in 1999 and 71% of the children in 2004. In 1999, 28,719 children in AZHQ had a known insurance status but of these children, only 21,820 utilized health care during 1999<sup>8</sup>. Approximately 91% of these children (n = 26,084) were insured at every encounter in 1999. An additional 5% (n = 1,428) were uninsured throughout 1999 and approximately 4% (1,207 children) were uninsured and insured at different points in time during 1999.

Figure 4. Data Used for AZHQ Estimates



Sources: AZHQ, 1999, 2004. U.S. Census Bureau, 2000, 2005.

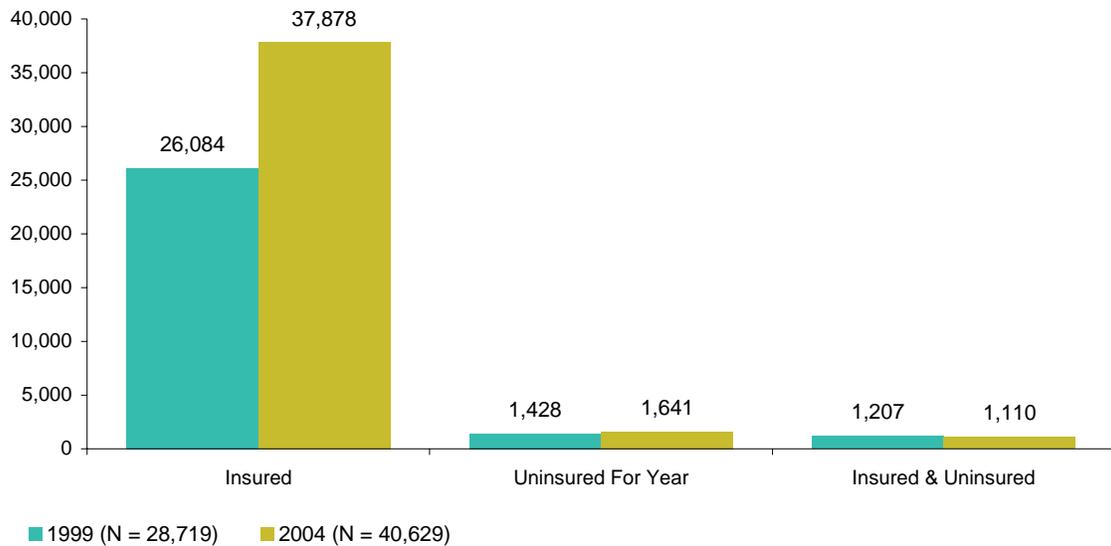
Note: 2004 AZHQ Counts are unduplicated. In 1999, ED visit counts—rather than people counts—were used.

<sup>8</sup> Those that did not use health care included, for example, children who were in the immunization database because they were previously immunized, but who did not receive health care in 1999.

The AZHQ estimates for 2004 are based on 40,629 children. Health insurance coverage of the much larger number of children in 2004 increased relative to 1999 (Figure 5). Approximately 93% (n = 37,878) were insured at every encounter in 2004, while approximately 4% (n = 1,641) were uninsured at all times during 2004 and approximately 3% (n = 1,110) were both insured and uninsured during 2004.

Thus, among children in the AZHQ with known insurance status, approximately 9% were uninsured at some time during 1999 and approximately 7% were uninsured at some time during 2004.

Figure 5. Insurance Coverage from AZHQ, 1999 and 2004



Source: AZHQ, 1999 and 2004.

To estimate the number of uninsured children in Yuma’s population, we apply the AZHQ age-specific rates of uninsurance to the total number of children in the corresponding age groups in the population.

### AZHQ Rates Applied to the Population

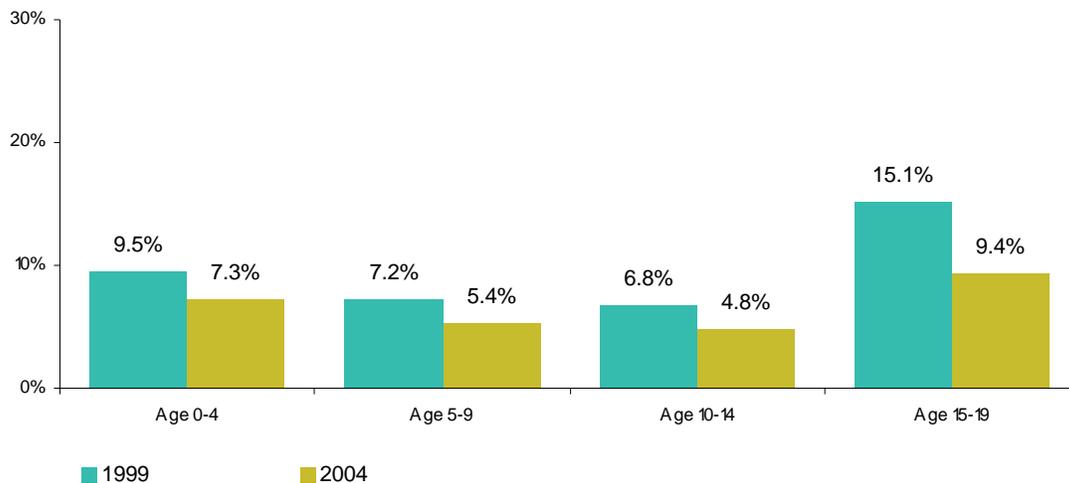
The application of the age-specific rates of uninsurance among the children in AZHQ to the population of Yuma children yields an estimate of approximately 4,500 Yuma County children uninsured at some time during 1999; the estimate for 2004 is more than 3,800. The differences between the age distribution of the children in the population and the AZHQ group increase the percentage of uninsured children from approximately 9% to approximately 10% in 1999. The difference is much smaller in 2004, namely 6.8% (AZHQ) vs. 6.7% (population) because the AZHQ contains data for a much larger portion of the population in 2004.

The estimated distribution of uninsured children in Yuma’s population by age is presented in Figures 6 and 7. The largest *proportion* of children without insurance is found in the 15 – 19 year age group in both 1999 and 2004. The next highest proportion of children without insurance is found in the 0 – 4 age group<sup>9</sup>.

The largest *number* of uninsured children is also found in the 15 – 19 age group, reflecting relatively high rates of uninsurance in that age group in both years. The second largest number of children is in the 0 – 4 age group for which uninsurance rates are lower than the oldest age group, but higher than the other groups, and the number of children in the age group is relatively large.

The proportion of children without health insurance was lower in 2004 than in 1999, for every age group. The largest decline (in percentage terms) in uninsurance rates occurred in the 15 – 19 age group where the reduction from 15.1% to 9.4% is a reduction of more than one-third.

Figure 6. Percentage of Children Without Insurance: AZHQ Rates Applied to the Population of Children

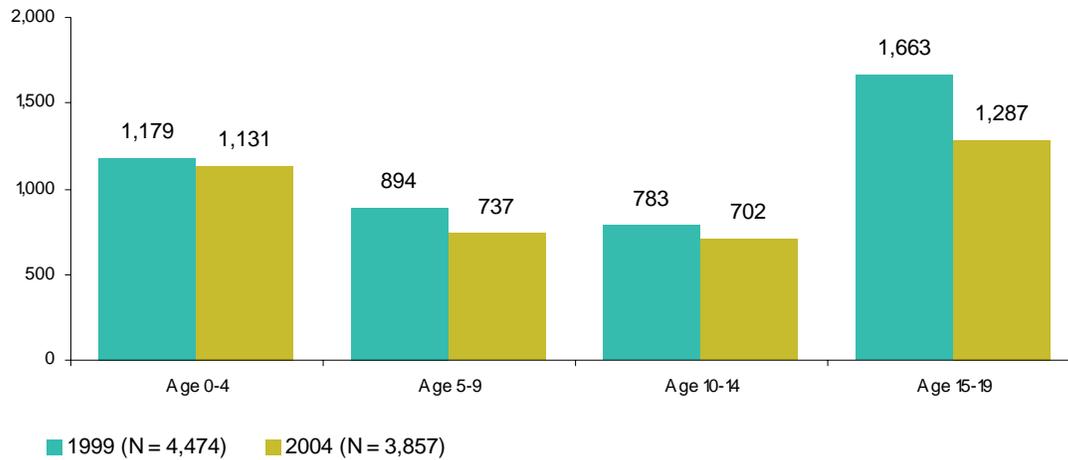


Source: AZHQ, 1999, 2004.

Note: Rates are calculated for children who used some health care in 1999 or 2004.

<sup>9</sup> In the 0 – 4 age group, differences in rates of uninsurance may occur between children age 0 – 1 and children age 2 – 4, because of eligibility differences between the two groups for insurance coverage from AHCCCS. If the mother of a newborn maintains AHCCCS eligibility, the baby is guaranteed eligibility for one year from birth, then must qualify for AHCCCS. In 2004, we found that 66% (6,768 of 10,208) of children age 0 – 1 had insurance coverage through AHCCCS, while the proportion of children age 2 – 4 with coverage through AHCCCS was 58% (4,717 of 8,162).

Figure 7. Number of Children Without Insurance: AZHQ Rates Applied to the Population of Children



Source: AZHQ, 1999, 2004.

The results from an alternative method of estimation that can be compared to the AZHQ estimates are described in the next section. The method relies on the health insurance coverage among children with conditions for which inpatient care is mandatory and is not, therefore, affected by a patient's insurance coverage. The mandatory admissions approach is effectively one in which a different natural sample is drawn from the AZHQ data.

## The Mandatory Admissions Estimate

### Concept

The concept of a mandatory hospitalization is the admission of a patient with "an acute condition that is life threatening or has the potential to produce long-term disability" (McConnochie, Roghmann, & Liptak, 1997). Children with conditions such as appendicitis receive inpatient care regardless of their insurance coverage. Therefore, the prevalence of uninsured children among children with conditions for which emergent or inpatient care is mandatory is an estimate of the prevalence of uninsurance in the population of children (McConnochie et al., 1997). See Appendix Table 2 in the Technical Notes section for a description of the conditions.

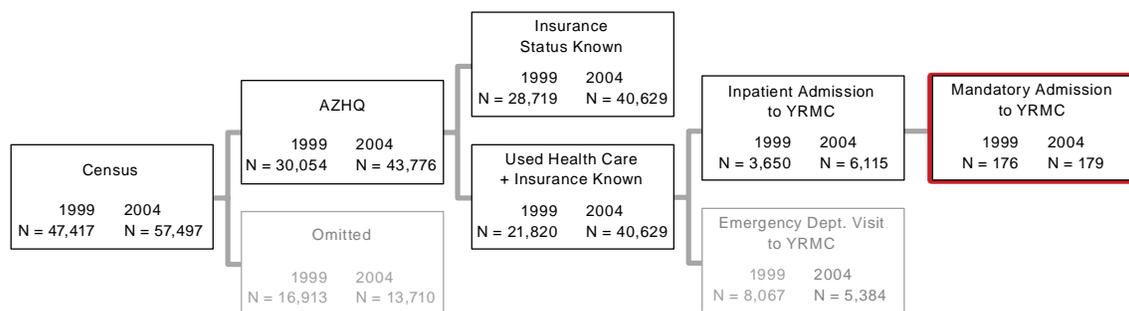
The estimate should be unbiased unless the incidence rates of the conditions that lead to these required "mandatory" admissions are significantly correlated with health insurance coverage. If, for example, uninsured children are more likely to contract the conditions than are insured children, then the mandatory admissions estimate of uninsured children would be too high.

The definitions of mandatory admissions were created in a 1997 study with reference to children age 0 – 2 (McConnochie et al., 1997). The use of the conditions for older children is predicated on a belief that it seems to be a reasonable assumption for the older children as well. In 2000, nevertheless, we asked the pediatricians on the Community Advisory Committee as well as a nationally known expert in pediatrics to review the extension to older children and identify potential problems of applying the mandatory admissions approach to older children. The reviews suggested that it was reasonable to apply the mandatory admissions approach to older children as well as to those 0 – 2 years of age.

### The Mandatory Admissions Results

YRMC is the only hospital in Yuma County. Nearly 3,700 children were admitted for inpatient care to YRMC in 1999. Slightly less than 5% of these children (N = 176) received care for conditions for which admission would be classified as mandatory. More than 6,000 children were admitted for inpatient care in 2004 and the number of children with mandatory admissions to YRMC increased to 179 in 2004, representing just less than 3% of total admissions in 2004 (Figure 8).

Figure 8: Data Used for Mandatory Admissions Estimates



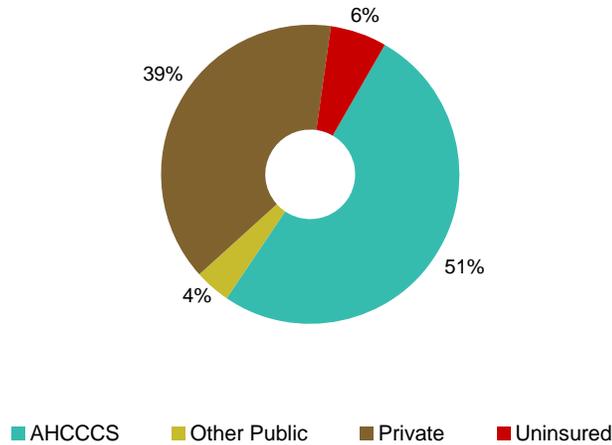
Sources: AZHQ, 1999, 2004. U.S. Census Bureau, 2000, 2005.

Note: 2004 AZHQ Counts are unduplicated; in 1999, ED visit counts—rather than people counts—were used.

Slightly less than 12% of the children with mandatory admissions were uninsured in 1999. Males were more likely to be uninsured than females and uninsurance rates were highest among children ages 10 – 19. More than 62% of children with mandatory admissions were Hispanic, but the proportion of Hispanic children that were uninsured was lower than that of White, non-Hispanic children.

In 2004, 179 children were admitted to YRMC with a condition requiring hospitalization—approximately 3% of the 6,115 children admitted to YRMC that year. Slightly more than 6% of the children with a mandatory hospital admission to YRMC were uninsured during 2004 (Figure 9). Of all Hispanic children with a mandatory hospital admission, nearly 8% were uninsured while the proportion of White, non-Hispanic children without insurance was 3.5%.

Figure 9. Insurance Status of Mandatory Admissions to YRMC, 2004 (N = 179)



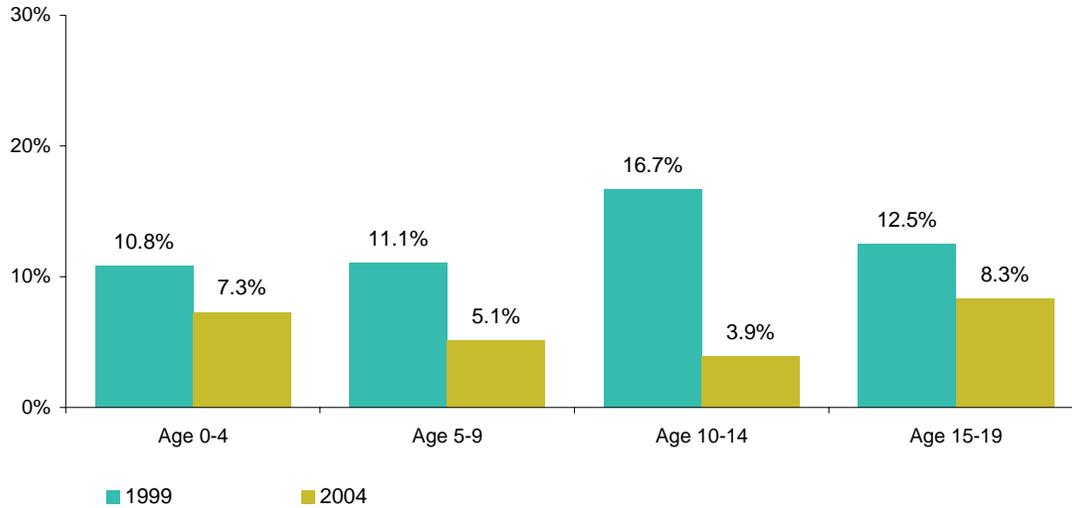
Source: AZHQ, 2004.

The expansion of the AZHQ database to other parts of Arizona yields information on mandatory admissions for Yuma children into hospitals other than YRMC. No comparable data are available for 1999. There were 144 children from Yuma with mandatory admissions to hospitals outside of Yuma County. The larger sample of mandatory admissions yields an estimate that approximately 5% of children with mandatory admissions were uninsured.

We applied the age-specific percentages of uninsured children among the YRMC mandatory admissions to the population of Yuma County children from the U.S. Census. The resulting estimates show that approximately 6,000 children in Yuma County were uninsured at some time during 1999 and 3,552 children were uninsured at some time during 2004 (Figure 11). As with the estimates of uninsurance rates, the application of the AZHQ rates to the population of Yuma County's children in 1999 resulted in a slightly higher percentage of uninsured children than the proportion of uninsured among children with mandatory admissions (approximately 13% vs. 12%); the proportion of children in the adolescent age groups, which have the highest rates of uninsurance in AZHQ, are higher in the general population than in the AZHQ data (Figure 10).

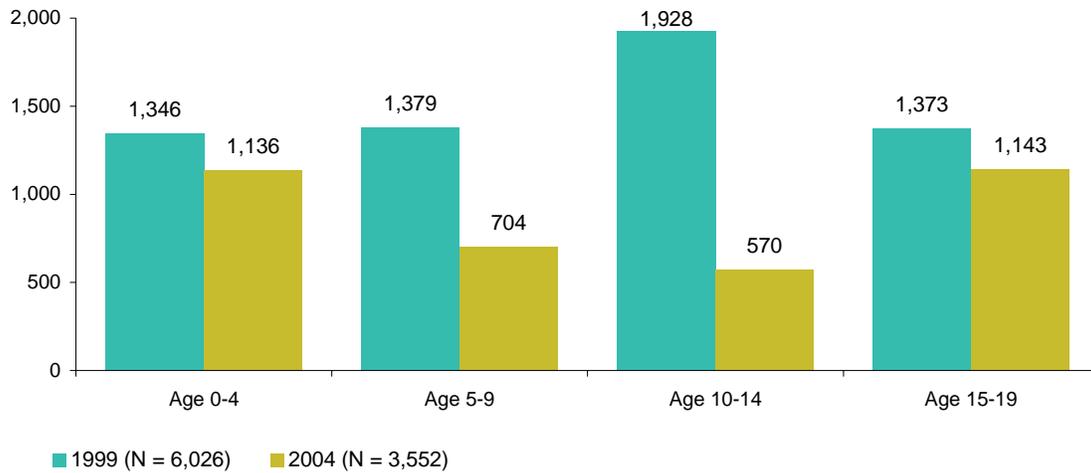
In 2004, however, there was no difference between the rate of uninsurance (6.2%) among those children with a mandatory admission and the rate obtained by applying the mandatory admission rate to the total population. The similarity in the rates is likely due to the very large coverage of children in the 2004 data.

Figure 10. Percentage of Children Without Insurance: Mandatory Admissions Rates Applied to the Population of Children



Source: AZHQ, 1999, 2004.

Figure 11: Number of Children Without Insurance: Mandatory Admissions Coverage Rates Applied to the Population of Children



Source: AZHQ, 1999, 2004.

All estimates are subject to limitations; these limitations should be carefully considered in drawing inferences from the estimates. The mandatory admissions group is extremely small and minor variations in the composition of the group can produce very large differences between the two comparison years.

Additionally, the mandatory admissions estimates are based on the assumption that the incidence of the conditions requiring admissions is not significantly correlated with insurance status. If, for example, the probability a child would suffer a severe fracture, cardiovascular emergency, or one of the other mandatory admissions conditions was correlated with being either insured or uninsured, then our estimates would be biased. The bias could tend to increase or reduce the rates of uninsurance in the mandatory admission group relative to the general population of children.

Although it seems unlikely that the conditions that we have used are significantly correlated with insurance status, it would be useful to test the validity of the assumption where it is possible to do so. One particularly useful test would be to limit the sample of children to those with acute appendicitis which is known not to be correlated with insurance status. Unfortunately the number of children with appendicitis in the Yuma data is too small to permit such a test.

One final caution is the possibility that some divergence exists between the admission rates at YRMC and the incidence of mandatory admissions conditions in the population because some children may receive care across the border in Mexico. We do not know if cross-border treatment for the most serious and most emergent health conditions is of sufficient frequency to affect the mandatory admissions estimates. One test of this question will be the results obtained for Maricopa County which will be presented in a subsequent report. The majority of the population of Maricopa County lives more than 100 miles from the border so crossing the border to seek care is not likely to be as prevalent as in Yuma County.

The results also offer some interesting implications for the use of the mandatory admissions approach to the estimation of health insurance coverage for small geographic areas. Many states maintain hospital discharge datasets. The mandatory admissions method could, if successful, be applied to these datasets to estimate rates of insurance coverage for small areas within states. The method cannot be used to identify individuals or evaluate the impact of insurance coverage on patterns of health care utilization. It does, however, offer the possibility of a low-cost, timely approach to the creation of periodic estimates of insurance coverage. A subsequent report in this series will apply the mandatory admissions approach to AZHQ data for both adults and children in Maricopa County.<sup>10</sup>

### **The CPS Estimates**

The fourth estimate of uninsured children is calculated from the CPS, which is the primary source of estimates of health insurance coverage of children in many states and is often used as a reference

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<sup>10</sup> We anticipate publication of this report May, 2007.

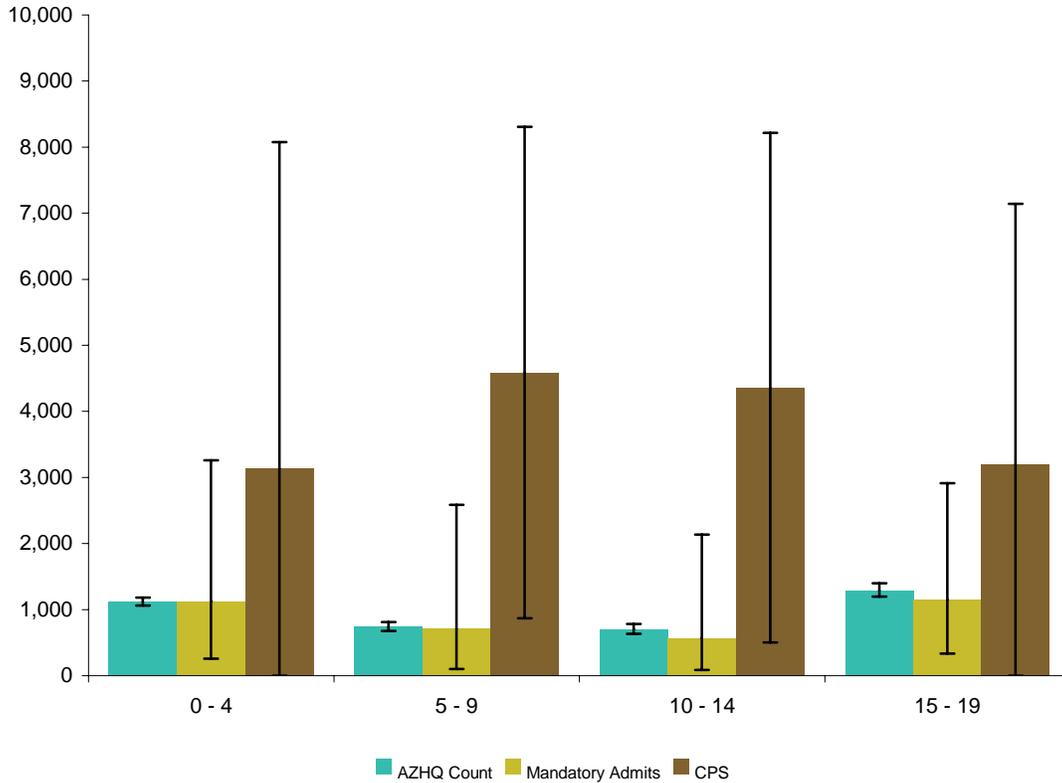
against which to compare the SCHIP enrollments. The CPS is recognized as a highly inaccurate source of information on health insurance coverage of children in relatively small states, such as Arizona, and more generally for counties in nearly any state.

A recent study that compares the estimates from state specific surveys to the CPS estimates found that state estimates of uninsurance rates were significantly lower than the CPS estimates in 23 of 24 states (Call et al., 2007). The differences ranged from 3.5% lower in Florida to 44% lower in Wisconsin. The mean difference was that state survey rates were nearly 22% lower than the CPS estimates. The design of the CPS as a national survey suggests that the differences observed for local areas will be larger than the estimates cited, which are statewide.

If we were to simply accept the 1999 estimates from the CPS, we would conclude that nearly 20,000 children in Yuma County were uninsured, representing nearly one-half of all the children in Yuma County in 1999. The CPS estimate for 2004 was that approximately 15,000 children were uninsured representing approximately one-fourth of all the children in Yuma (U.S. Census Bureau, 2000, 2005). The CPS results reflect its inherent error in estimating both the size of the population of children at the county level plus the error in estimating the percentage of Yuma's children who are uninsured.

The CPS sampled only 39 Yuma County children in 1999, 18 of whom responded that they were uninsured. The 2004 sample included 55 children of whom 14 responded that they were uninsured (U.S. Census Bureau, 2000, 2005). Small samples do not necessarily preclude viable inferences to larger populations, but the limits of applying the CPS to counties and other smaller geographic regions are represented by the very large confidence intervals of the CPS estimates (Figure 12). The 2004 CPS applied to Yuma County estimates that about 15,000 children are uninsured, with a 95% confidence interval range from more than 8,600 children to approximately 23,500 children. Another way of stating this is that we can be 95% certain that the true proportion of uninsured children in 2004 is between 15% and 41% of all children in Yuma County, a range that is obviously too large to be useful.

Figure 12. Estimates and 95% Confidence Intervals of the Number of Uninsured Children in Yuma by Age Group and Estimation Method, 2004



Sources: AZHQ, 2004; U.S. Census Bureau, 2005.

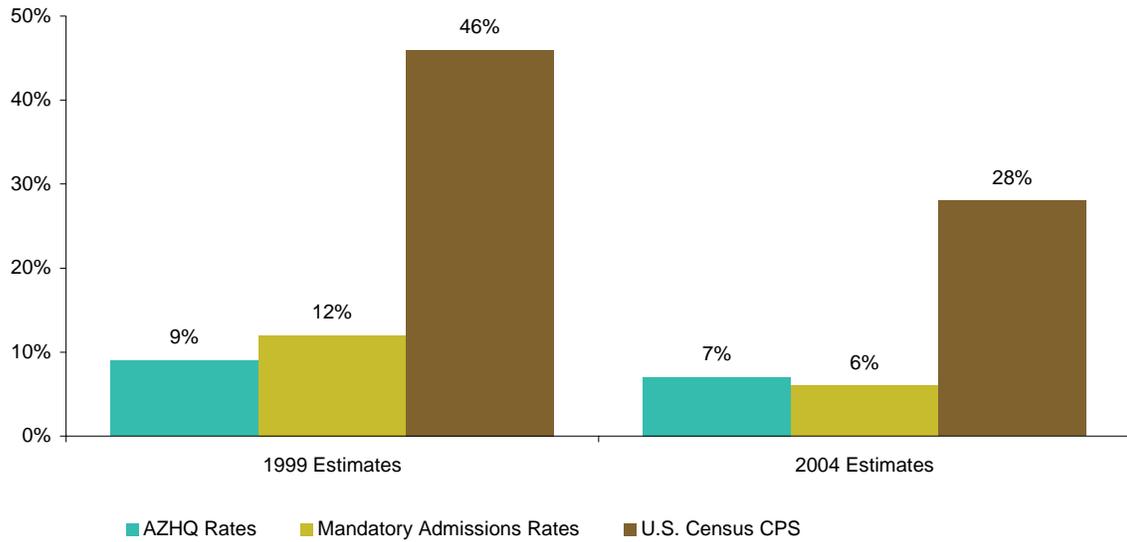
The comparison of our estimates to the CPS is nevertheless important, because of the widespread use of the CPS estimates which often become the *de facto* estimate in public policy decisions (Figure 12). It is understandable but regrettable that the media often present estimates of the percentage of uninsured children from the CPS data as if they are exact measures.

### The Estimates Compared

The AZHQ estimates of the proportion of children who are uninsured for 1999 or in 2004 are substantially below the rates expected for certain communities, such as Yuma, with a high proportion of Hispanic children living in low income households, including many families headed by migrant workers (Johnson et al., 2001; Figure 13). The difference should not, however, be interpreted to mean that the lack of insurance coverage is not a problem in Yuma County. The community-based AZHQ estimates show that approximately 4,500 – 6,100 children were uninsured at some time during 1999 and that approximately 3,500 – 3,900 children lacked coverage in 2004 (Figure 14).

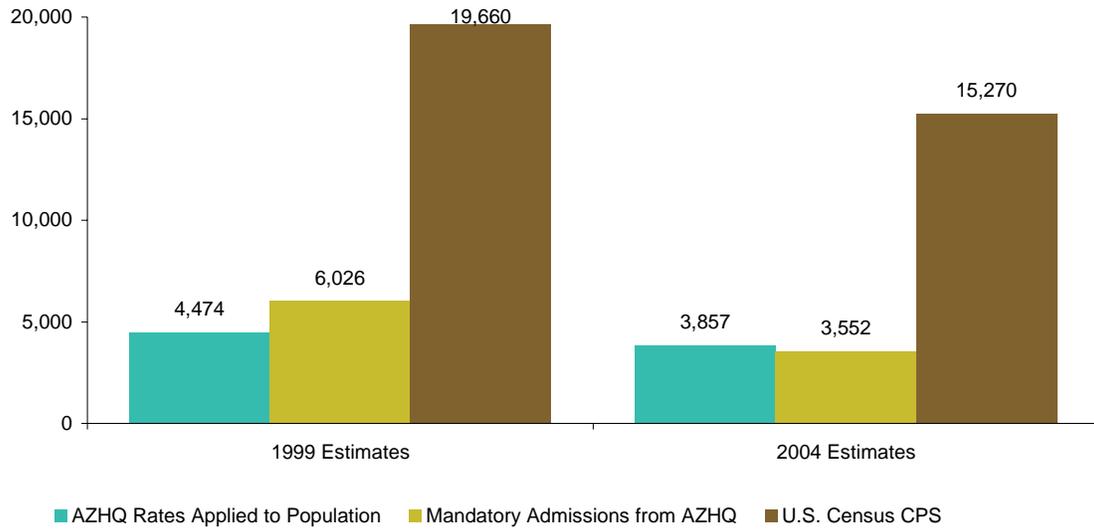
The results are a useful alternative to the opinions and fragmentary evidence that is often cited in support of proposals for public interventions or in the debate on the failure or success of programs such as SCHIP.

Figure 13: Comparison of Estimates of Uninsurance Rates for the Population



Sources: AZHQ, 1999, 2004; U.S. Census Bureau, 2005.

Figure 14: Comparison of Estimates of the Number of Uninsured Children



Sources: AZHQ, 1999, 2004; U.S. Census Bureau, 2005.

The most interesting feature of the comparisons between the two years is the substantial increase in health insurance coverage. The decline in the percentage of children without insurance was so large that the estimated number of children without insurance declined despite a substantial increase in the *number* of children living in Yuma County. Despite the very large differences between the CPS estimates and the rates based on AZHQ data, substantial increases in health insurance coverage are also reported by the CPS.

One possible reason for the improvement in insurance coverage is the introduction of the SCHIP initiative. Legislation for Arizona’s SCHIP program, KidsCare, was passed in 1998 and implementation began in October, 1998. AHCCCS/SCHIP is the predominant source of health insurance for children in Yuma County because of the very large number of children in low income households.

Jointly funded by the federal and state governments in 1998, SCHIP eligibility limits were raised from 150% of the Federal Poverty Level (FPL) in 1998 to 200% FPL in 1999. Proposition 204, passed by Arizona voters in 2000, changed the eligibility requirements for AHCCCS enrollment so that adults earning between 34% of the FPL and 100% of the FPL became eligible for AHCCCS in 2001. This increase in eligibility affected the 18 and 19 year olds in this study, increasing rates of insurance coverage among this population. (AHCCCS Claims Department, 2001)

In addition, during the implementation of the SCHIP program, AHCCCS actively sought applications to the program; many of the applicants were qualified for AHCCCS (not SCHIP), which does not require any co-payment. From 1998 to 2004, AHCCCS enrollment figures indicate that statewide, nearly 170,000 children were enrolled in Title XIX AHCCCS programs based on KidsCare (Arizona’s SCHIP) applications. During this same time period, the proportion of Arizona’s entire population on AHCCCS (including KidsCare) increased from 9.3% to 17.2% (AHCCCS, 2005).

**Table 2. Statewide Enrollment, KidsCare/AHCCCS Due to KidsCare Application, 1999 – 2004**

Year	Estimated Arizona Population of Children Under Age 18	KidsCare Enrollment (% of Population)	AHCCCS Enrollment from KidsCare Applications (% of Population)	Total Enrollment from KidsCare Applications (% of Population)
1998	1,291,225	2,252 2.0%	0 0.0%	2,252 2.0%
1999	1,334,574	21,256 1.6%	18,693 1.4%	39,949 3.0%
2000	1,366,937	38,073 2.8%	44,906 3.3%	82,979 6.1%
2001	1,509,932*	53,685 3.6%	77,362 5.1%	131,047 8.7%
2002	1,476,856	47,542 3.2%	109,456 7.4%	156,998 10.6%
2003	1,519,312	50,705 3.3%	146,132 9.6%	196,837 13.0%
2004	1,547,260	48,169 3.1%	171,638 11.1%	219,807 14.2%

Source: AHCCCS, 2005; U.S. Census, 1998-2004, 2006. Census data are as of July 1; AHCCCS data are as of October 1 each year.  
 \*Note: The U.S. Census did not perform county level postcensal estimates in 2001. This number is the intercensal estimate.

According to AHCCCS, KidsCare enrollment increased from 1,441 in December, 1999 to 2,249 in December, 2004—an increase of 808 children, or from 3% to 4% of the population of children. Since the number of children on non-KidsCare AHCCCS due to KidsCare applications has increased more rapidly than the number of children on KidsCare (see Table 2), there is support for our view that the KidsCare program and associated outreach efforts are responsible for the increase in insurance coverage.

There have also been a number of private initiatives, including projects sponsored by philanthropic organizations, to enroll eligible children in AHCCCS/SCHIP (AHCCCS, 2003). The Yuma Regional Medical Center operates a school-based health care program for Yuma children. The program provides primary care services for all children in the family, and is the “medical home” for those children who are not eligible for SCHIP or AHCCCS. It also deliver care to outlying areas with a mobile clinic and health care providers make regular visits to the very small outlying communities located to the East and north of the city of Yuma. The program, begun in 1996 and funded by Yuma Regional Medical Center and the YRMC Foundation, has been enrolling eligible children in AHCCCS and subsequently SCHIP since that time. The program provided more than 800 visits in FY 2005 – 2006 (P. Dalabatta, personal communication, March 21, 2007).

Another community based activity, namely the Regional Center for Border Health has conducted its outreach immunization campaign, “Nuestros Niños,” in San Luis, Gadsden, Somerton, and Yuma since 1998. The campaign is a door-to-door campaign in June and July of each year, and includes a health care census and immunization assessment, and provides information on available health care resources including AHCCCS and SCHIP (M.J. Almazan, personal communication, March 27, 2007).

## **Summary and Discussion**

There are several interesting differences in health insurance coverage of Yuma County’s children between the years 1999 and 2004. The most interesting is that the percentage of uninsured children dropped significantly between the two years. The increased rate of health insurance coverage was so large that despite a 21% increase in the population of children, there was a decline in the number of children without health insurance coverage. Increases in health insurance coverage occurred in every age group and among both Hispanic and non-Hispanic children.

Any estimate must be interpreted within the constraints of the data and the assumptions on which it is based. We offer the following cautions:

Influences that tend to make the estimated uninsurance rate too high:

The estimate counts children as uninsured who were insured and uninsured at different times during 1999 or 2004, respectively.

The omitted children are likely to be disproportionately representative of children whose health care was provided by private physicians and who were covered by private insurance. These children are more likely to be from higher income families with an above-average probability of being covered by health insurance.

The influence that tend to make the estimate too low:

The omitted group of children also includes children who were not insured and did not receive care. Except for children captured by enrollment rather than encounter data (primarily AHCCCS coverage) reliance on capturing insurance status at the time of an encounter would tend to overstate insurance coverage.

Despite the appropriate cautions expressed here, it is important to recognize that the estimates are based on 46% of the entire population of children in Yuma County in 1999, and 71% of the children in 2004. The dataset is unparalleled in size and detail concerning the health insurance coverage of children in such a small geographic area.

The finding that the CPS estimates are higher than the AZHQ based results in both years is consistent with a recent research report that shows that estimates from state specific surveys for 24 states are, except for one state, lower than the rates reported by CPS. The state estimates of uninsurance rates are 3.5% to 44% lower than the CPS estimates for the respective sates (Call et al., 2007)

Despite the very large differences between the CPS estimates for Yuma County and the rates based on AZHQ data, substantial increases in health insurance coverage are reported by AZHQ and CPS.

A test of the extent to which the observed changes in health insurance coverage are attributable to changes in eligibility, increased outreach, or public or private initiatives is beyond the scope of this report. It is clear, however, that by any of the three measures of health insurance coverage that we use, that there was a significant improvement in health insurance coverage for the children of Yuma County between 1999 and 2004.

The results also offer some interesting implications for the use of the mandatory admissions approach to the estimation of health insurance coverage for small geographic areas. Many states maintain hospital discharge datasets. The mandatory admissions method could, if successful, be applied to these datasets to estimate rates of insurance coverage for small areas within states. The

method cannot be used to identify individuals or evaluate the impact of insurance coverage on patterns of health care utilization. It does, however, offer the possibility of a low-cost, timely approach to the creation of periodic estimates of insurance coverage. A subsequent report in this series will apply the mandatory admissions approach to AZHQ data for both adults and children in Maricopa County.<sup>11</sup>

One benefit of health insurance coverage is to facilitate timely access to appropriate care. The assumption that insurance coverage eliminates the obstacles to achieving the objective should, however, be tested empirically. Following the 1999 study of health insurance, we undertook several more specific analyses of effect of insurance coverage on health care utilization by children, using the data from Yuma County. The results are described in the Appendix on CHIR Research.

## Conclusions

The results presented in this report and the findings of five studies (see Appendix) that we have completed since the first report of health insurance coverage in 1999 can be summarized as follows.

The current study:

- The health insurance coverage<sup>12</sup> of children in Yuma County in 2004 is substantially better than the coverage in 1999.
- The improvement in coverage has been so large that the numbers of uninsured children have declined despite a very large increase in the numbers of children in the population of Yuma County.
- The improvement in coverage is observed in both AZHQ based estimates and estimates from the U.S. Current Population Survey.
- The improvement in proportion of children with health insurance is likely to be the result of changes in the eligibility requirements for AHCCCS/SCHIP and out reach efforts by both private and public organizations. This possibility has not been subjected to a rigorous test but the descriptive data from AHCCCS and the reports of outreach by YRMC and the Regional Center for Border Health are consistent with that suggestion.

Our other studies:

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<sup>11</sup> We anticipate publication of this report May, 2007.

<sup>12</sup> Throughout the report, we have used the term “in insurance coverage” to mean that the proportion or number of people with insurance has increased; we do not discuss changes in insurance benefits as insurance coverage.

- A current study of a cohort of Yuma children (sponsored by the National Institutes of Health) over several years indicates that a very small proportion of children (less than 2%) are continuously uninsured.
- The completed studies of ED use found that uninsured children are much more likely than insured children to use an ED for non-emergent care.
- A simulation study of the effects of increasing cost sharing or reducing eligibility for AHCCCS/SCHIP would reduce program expenditures but increase public health expenditures and/or uncompensated care.

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## **Technical Notes**

### **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.

#### **Census Data**

Estimates of the numbers of uninsured children in this report are developed by applying rates of uninsurance by age group to the census estimates for 1999 and 2004. The 2004 estimates we used are cited in the text. The 1999 estimates, on the other hand, have changed since the initial report. (Johnson et al., 2001) The census estimates for the population of children in Yuma County were revised in two ways following the decennial census in 2000. The annual population estimates are the computed number of persons living in an area as of July 1. The computations used to make the estimates take into account births, deaths, and people moving into and out of the state, both from other states and from abroad. More information on methodologies is available at ([http://www.census.gov/popest/topics/methodology/2006\\_st\\_co\\_meth.html](http://www.census.gov/popest/topics/methodology/2006_st_co_meth.html)). The Intercensal estimates are developed by interpolating between the decennial census years and adjusting the interpolations using various formulae based on the national, state and county population estimates. In order to preserve the original data as much as possible in this report, we decided to continue to use our 1999 estimates of the uninsured based on unadjusted 1999 census numbers. In order to do so, we determined the potential impact of the census estimate changes (Appendix Table 1.) The original numbers and the Annual Time Series estimate for 1999 yield virtually identical results in estimating the number of uninsured children in Yuma County. The Intercensal estimates are only 0.1% higher for both the AZHQ count estimates and the mandatory admission estimates. These results lend a great deal of confidence to our use of these estimates in this report.

Appendix Table 1. Comparison of Estimates of the Number of Uninsured Children in Yuma County Using Various Population Estimates, 1999

ORIGINAL 1999 ESTIMATES				
<i>AZHQ Count 1999</i>		<i>1999 Population Estimates</i>	<i>Num. Uninsured from 1999 Est.</i>	<i>Est. % Uninsured</i>
Age 0 - 4	9.5%	12,461	1,184	
Age 5 - 9	7.2%	12,427	895	
Age 10 - 14	6.4%	11,546	739	
Age 15 - 19	15.1%	10,983	1,658	
Overall Rate	9.8%	47,417	4,476	9.4%
<i>Mandatory Admission 1999</i>		<i>1999 Population Estimates</i>	<i>Num. Uninsured from 1999 Est.</i>	
Age 0 - 4	10.8%	12,461	1,346	
Age 5 - 9	11.1%	12,427	1,379	
Age 10 - 14	16.7%	11,546	1,928	
Age 15 - 19	12.5%	10,983	1,373	
Overall Rate	12.7%	47,417	6,026	12.7%
1999 INTERCENSAL ESTIMATES				
<i>AZHQ Count 1999</i>		<i>1999 Population Estimates</i>	<i>Estimated Uninsured</i>	<i>Est. % Uninsured</i>
Age 0 - 4	9.5%	12,435	1,181	
Age 5 - 9	7.2%	12,841	925	
Age 10 - 14	6.4%	12,415	795	
Age 15 - 19	15.1%	11,723	1,770	
Overall Rate	9.8%	49,414	4,671	9.5%
<i>Mandatory Admission 1999</i>		<i>1999 Population Estimates</i>	<i>Num. Uninsured from 1999 Est.</i>	
Age 0 - 4	10.8%	12,435	1,343	
Age 5 - 9	11.1%	12,841	1,425	
Age 10 - 14	16.7%	12,415	2,073	
Age 15 - 19	12.5%	11,723	1,465	
Overall Rate	12.7%	49,414	6,307	12.8%
ANNUAL TIME SERIES ESTIMATES				
<i>AZHQ Count 1999</i>		<i>1999 Population Estimates</i>	<i>Estimated Uninsured</i>	<i>Est. % Uninsured</i>
Age 0 - 4	9.5%	12,163	1,155	
Age 5 - 9	7.2%	12,035	867	
Age 10 - 14	6.4%	11,236	719	
Age 15 - 19	15.1%	10,653	1,609	
Overall Rate	9.8%	46,087	4,350	9.4%
<i>Mandatory Admission 1999</i>		<i>1999 Population Estimates</i>	<i>Num. Uninsured from 1999 Est.</i>	
Age 0 - 4	10.8%	12,163	1,314	
Age 5 - 9	11.1%	12,035	1,336	
Age 10 - 14	16.7%	11,236	1,876	
Age 15 - 19	12.5%	10,653	1,332	
Overall Rate	12.7%	46,087	5,858	12.7%

1999 Census Figures from 2001 Report: U.S. Census, 2000, cited in Johnson, W.G., Johnson, S.E., Marcus, S.C., Bartels, A., & Lawthers, A.G. (2001). *The Yuma project on uninsured children*. Monograph, School of Health Administration and Policy, W. P. Carey School of Business, Arizona State University. 1999 Annual Time Series Estimate, Revised: U.S. Census Bureau, Population Division. 1990 to 1999 Annual Time Series of State Population Estimates by Age and Sex. Accessed March 5, 2007 at <http://www.census.gov/popest/archives/1990s/co-99-09/CO-99-9-04.txt>. 1999 Intercensal Estimate, Revised: U.S. Census Bureau, Population Division. Intercensal Estimates by Demographic Characteristics (1990 – 1999). Accessed March 5, 2007 at <http://www.census.gov/popest/archives/EST90INTERCENSAL/STCH-Intercensal/STCH-Intercensal/STCH-icen1999.txt>.

## Definitions

*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 or African American, American Indian/Alaska Native, Asian/Pacific Islander and Other) are non-Hispanic. Race and ethnicity Census numbers for 1999 and 2004 were reported differently due to revisions in Census 2000 and the differences are reflected in our illustrations. Due to smaller AZHQ numbers, we combined Asians and Pacific Islanders into one category and for this report included them with other race and ethnicity, 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.

### Appendix Table 2. Conditions Requiring Hospitalization

Condition	ICD9 Codes
Gastrointestinal emergency, appendicitis, bleed, obstruction, perforation	540.0, 540.9, 550.02, 550.1x, 552.3, 552.8, 553.3, 557.0, 557.9, 560.0, 560.1, 560.2, 560.8x, 560.9, 567.2, 567.8, 569.83, 750.5, 751.0
Bacteremia, septicemia	003.1, 036.2, 038.0, 038.1, 038.2, 038.3, 038.4x
H influenzae meningitis	320.0, 038.41, 464.30 482.2, 711.0x
Orbital cellulitis	360.00, 376.01
Severe fracture	808.2, 808.8, 820.01, 821.0x, 821.10, 821.2s
Third-degree burn	941.3x, 941.43, 943.3x, 944.3x, 945.3x, 945.49, 946.3, 948.10, 948.2x, 948.30, 949.4
Other pulmonary emergency, e.g. pneumothorax, emphysema	510.9, 511.8, 511.9, 512.0, 512.8, 513.0, 518.0, 518.4, 518.5, 519.2
Cardiovascular emergency, e.g. arrest, dysrhythmia, thrombosis, infarct, embolism, shock	415.1, 420.9x, 421.0, 422.91, 423.9, 427.1, 427.41, 427.5, 444.2x, 453.8, 459.2, 785.5x
Other bacterial meningitis	036.0, 320.1, 320.2, 320.3, 320.8, 320.9, 324.0, 325
Respiratory failure	518.81
Foreign body in airway	934.0, 934.1, 934.8, 934.9
Severe trauma, e.g. near drowning, rupture of liver, penetrating wound to eye	861.00, 861.21, 863.30, 863.54, 870.1, 870.2, 871.0, 871.1, 871.4, 871.6, 895.0, 958.0. 994.1
Severe head trauma	432.1, 800.10, 800.2x, 800.33, 801.06, 801.42, 850.1, 851.82, 852.0x, 852.2x, 852.41, 854.0x
Seizure, intractable	345.3, 345.41, 345.91

Source: McConnochie et al. 1997.

## Appendix: CHIR Research on Health Care Insurance

The AZHQ database has provided CHIR staff with unparalleled ability to answer research questions about health care insurance, and costs of care for the insured and uninsured. Five studies based on the Yuma County data have been completed since the year 2000, with a sixth scheduled for completion later this year. Two of these studies were published in scholarly journals, one was published as a CHIR working paper, and one is being prepared for submission. Here is a brief summary of what we have learned about insurance from the AZHQ data on Yuma County:

- *The Stability of Children's Health Insurance Coverage.* Johnson, T.J., & Bartels, A. A CHIR Working Paper (January 2005); a description of insurance coverage changes over time among a cohort of children.

This study of a cohort of uninsured children in AZHQ from Yuma revealed a complex pattern of shifts among insurers as well as episodes of coverage mixed with episodes of uninsurance for some children. The research found that most uninsured children are insured and uninsured at different times; our research also found that the insurance status of a child affects the kind of care and cost of care that child receives.

- *The Effects of Access to Pediatric Care and Insurance Coverage on Emergency Department Utilization.* Johnson, W.G., & Rimsza, M.E. Pediatrics (March 2004); an analysis of the influence of insurance on the use of emergency departments to treat conditions that could have been effectively treated in a primary care, ambulatory setting.

This study of ambulatory care sensitive conditions found that uninsured children were nearly four times more likely to use the emergency department than insured children. Among insured children, those covered by Medicaid were 54% less likely to use the emergency department than children insured with private insurance. Further, controlling for age, gender, ethnicity and area of residence, children who received care from a private practice pediatric group were 73% less likely to use the emergency department if insured and 93% less likely, if uninsured, than children who had not visited a pediatrician.

- *Children Who Use the Emergency Department as their "Medical Home."* Rimsza, M.E., Johnson, W.G., & Johnson, T.J. . A CHIR Working Paper, (September 2003); an analysis of the effect of health insurance coverage on children's reliance on emergency departments as their sole source of care. Our research on the use of health care by Yuma children found that Yuma Regional Medical Center was 1.4 times as likely to be the sole provider of care for uninsured children than for insured children. But 68% of children whose only known source of non-emergent care was the

emergency department were insured. Children insured by Medicaid were 90% less likely than privately insured children to use the emergency department as their usual source of non-emergent care.

- *The Effect of Ethnicity and Health Insurance Coverage on Health Care for Children with Asthma.* Johnson, T.J., Rimsza, M.E., & Johnson, W.G. A CHIR Working Paper: an examination of the effect of ethnicity and health insurance coverage on differences in emergency department utilization and hospitalizations between Hispanic and non-Hispanic children with asthma.

This study of 1,171 Yuma children with asthma found that Hispanic children, most of whom lived farther from the emergency room, had fewer ED visits and hospitalizations per 1,000 children than their non-Hispanic counterparts. Children with gaps in insurance coverage had more ED visits than those with steady coverage, whether Hispanic or non-Hispanic. Hispanic and non-Hispanic children who lived near the ED had about the same number of visits. The differences in ED use between non-Hispanic and Hispanic children were entirely explained by ethnicity and other unobservable factors.

- *The Effects of Cost-Shifting in the State Children's Health Insurance Program.* Johnson, T.J., Rimsza, M.E., & Johnson, W.G. American Journal of Public Health (April 2006); a simulation of the cost effects of reducing enrollments in SCHIP by limiting eligibility or increasing cost sharing.

This article estimates that increasing the monthly premium for SCHIP would increase the number of uninsured children in Yuma by 10%, and the addition of these 359 children would add 159 ED visits and 54 hospitalizations in 2004, while reducing physician visits by 654. These changes would increase total health expenditures by \$166,599 over keeping these children on SCHIP. These increase costs may be the responsibility of the state or public or private health systems; these changes in utilization make the apparent savings from a demand-side cost shift illusory.

- **Health Patterns: Hispanic and Non-Hispanic Children;** William G. Johnson, Principal Investigator (sponsored by the National Institutes of Health), expected completion August 2007. This study will analyze health disparities between Hispanic and non-Hispanic children, defined as ethnic-related differences in: (a) using an emergency department for non-urgent care, (b) receiving Advisory Committee on Immunization Practices (ACIP) recommended immunizations (c) receiving guideline-consistent early periodic screening and developmental testing (EPSDT; age 0-4), and (d) receiving National Asthma Education and Prevention Program (NAEPP) guideline consistent care for asthma.