

Janet Napolitano, Governor
Anthony D. Rodgers, Director



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March 28, 2008

The Honorable Janet Napolitano
Governor of Arizona
1700 W. Washington St.
Phoenix, AZ 85007

Dear Governor Napolitano:

Enclosed is the Arizona Health Care Cost Containment System's *Biennial Report of Immunization Completion Rates at 24 Months of Age* for the contract year ending Sept. 30, 2007. This report is submitted pursuant to Arizona Revised Statutes 36-2904(N).

I am pleased to report that this study shows that AHCCCS is meeting immunization completion goals for nearly every individual vaccination and vaccine series. Immunization rates among Medicaid-eligible children enrolled with AHCCCS health plans outscore the most recent national means for Medicaid health plans. The overall AHCCCS rates (Medicaid and KidsCare combined) also meet or exceed all current means for commercial managed care plans, except for one vaccination.

AHCCCS will continue to work in partnership with contracted health plans, the Arizona Department of Health Services, The Arizona Partnership for Immunization (TAPI) and others to maintain high levels of completed immunizations among our members.

If you have questions regarding this report, please contact Kim Elliott, PhD, Administrator, Clinical Quality Management, at (602) 417-4782.

Sincerely,

A handwritten signature in black ink that reads 'Anthony D. Rodgers'.

Anthony D. Rodgers, Director

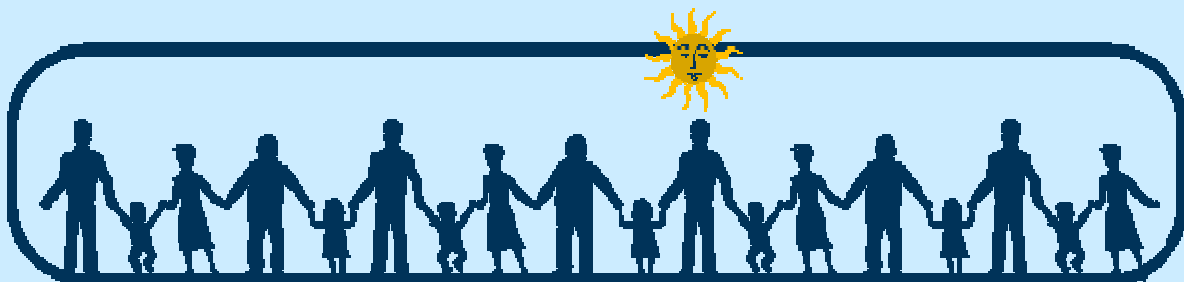
Encl.

cc: Hon. Timothy S. Bee, President, Arizona Senate
Hon. Jim Weiers, Speaker of the House, Arizona House of Representatives
Hon. Carolyn S. Allen, Chairman, Senate Health Committee
Hon. Bob Stump, Chairman, House Health Committee
January Contreras, Policy Advisor for Health

Arizona Health Care Cost Containment System



Biennial Report of IMMUNIZATION COMPLETION RATES AT 24 MONTHS OF AGE



To the Governor, President of the Senate and Speaker of the House

Measurement Period: October 1, 2006, through September 30, 2007

Prepared by the Division of Health Care Management
March 2008

Anthony D. Rodgers
Director, AHCCCS

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Arizona Health Care Cost Containment System (AHCCCS)

Biennial Report of

IMMUNIZATION COMPLETION RATES AT 24 MONTHS OF AGE

To the Governor, President of the Senate and Speaker of the House

Measurement Period Ending Sept. 30, 2007

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Arizona Health Care Cost Containment System (AHCCCS)

Biennial Report of IMMUNIZATION COMPLETION RATES AT 24 MONTHS OF AGE Measurement Period Ending Sept. 30, 2007

EXECUTIVE SUMMARY

Background

Routine immunization of children and adults is a safe and cost-effective method of preventing serious and potentially life-threatening diseases.¹⁻³ Many of these diseases, such as measles and varicella (chicken pox) often are considered mild illnesses that are part of childhood. But measles is a highly infectious disease that can cause severe pneumonia, diarrhea, encephalitis (inflammation of the brain) and even death. A resurgence of measles from 1989 to 1991 resulted in more than 55,000 cases in the United States, 11,000 hospitalizations, 120 deaths, and \$100 million in direct medical care costs.⁴ To prevent unnecessary illness, hospitalizations and deaths, high rates of vaccination are necessary – generally 90 percent or greater, according to the Centers for Disease Control and Prevention (CDC).

Based on the CDC's recommendations, the U.S. Department of Health and Human Services (DHHS) established a goal that, by the year 2010, 90 percent of children 19 to 35 months of age will be fully vaccinated for universally recommended vaccines. The most recent rates reported by the National Committee for Quality Assurance (NCQA), which has developed a standardized methodology for managed care organizations to measure childhood immunizations, indicate that Medicaid health plans overall have not met the 90-percent goal for most vaccines.⁵ National averages (means) for Medicaid health plans in 2006 ranged from 79.3 percent for completion of the diphtheria, tetanus, and acellular pertussis (DTaP) vaccine to 91.1 percent for completion of the measles, mumps and rubella (MMR) vaccine. Commercial means were somewhat higher, ranging from 87.2 percent for completion of the DTaP vaccine to 93.6 percent for completion of the MMR vaccine.

The Healthy People 2010 objective for immunization of children with the series of five vaccines known as the 4:3:1:3:3 combination is 80 percent. This combination is not measured by NCQA.

Since 1993, the Arizona Health Care Cost Containment System (AHCCCS) has regularly measured the immunization status of children at 24 months of age. This report includes results of the most recent measurement of immunization for 11 childhood diseases, generally using the following vaccines (or antigens): DTaP, inactivated poliovirus (IPV), MMR, Haemophilus influenzae type b (Hib), hepatitis B virus (HBV), varicella zoster virus (VZV) and pneumococcal conjugate vaccine (PCV). This measurement includes children who turned 2 years old during the contract year ending (CYE) Sept. 30, 2007, and who were enrolled with AHCCCS-contracted health plans (Contractors) under Medicaid (Title XIX of the Social Security Act) or KidsCare (Title XXI, the state's Child Health Insurance Program).

AHCCCS has established goals and minimum standards for childhood immunization rates, which are used in evaluating Contractor performance. Contractors must meet a Minimum Performance Standard (MPS) for each vaccine or vaccine series; if they fail to do so, they must implement corrective action plans, and may be subject to sanctions if they fail to improve their rates. AHCCCS also has set long-range goals, or benchmarks, which reflect Healthy People 2010 objectives.

Methodology

AHCCCS used NCQA Healthcare Effectiveness Data and Information Set (HEDIS) 2007 measurement criteria to conduct this assessment. A representative random sample of children who turned 24 months old on or between Oct. 1, 2006, and Sept. 30, 2007, and who were continuously enrolled with a Contractor for 12 months prior to and including their second birthdays was selected. The sample was stratified by AHCCCS Contractor, accounting for distribution of members by county.

All data were collected according to applicable privacy and confidentiality laws and safeguards. AHCCCS first obtained data from the Arizona State Immunization Information System (ASIIS), an automated registry maintained by the Arizona Department of Health Services (ADHS). AHCCCS provided ASIIS with database files containing the sample cases of Medicaid and KidsCare children. ASIIS staff searched the registry by first name, last name, and date of birth and cross-matched the AHCCCS sample against patients in the registry.

ADHS then provided all immunization data in the registry for those patients it was able to match to Health Services Advisory Group (HSAG), an external quality review organization. HSAG was retained by AHCCCS to assist with data collection, and to aggregate and analyze final results.

HSAG calculated initial immunization completion rates by Contractor, based on the ASIIS data. Sample members were considered complete if, based on data reported to ASIIS, they had four doses of DTaP, three doses of IPV, one dose of MMR, three doses of Hib, three doses of HBV, one dose of VZV and four doses of PCV (known as the 4:3:1:3:3:1:4 combination),.

HSAG sorted those members with incomplete or no records found in ASIIS by Contractor and created an Excel spreadsheet for each Contractor, listing the plan's members who had incomplete or no records in ASIIS, and including any vaccination data obtained from the registry. HSAG provided each Contractor its data file with instructions for collecting additional data from medical records or claims information, in accordance with HEDIS methodology.

Overall Results and Analysis

The final sample size consisted of 5,519 children enrolled in AHCCCS. This number included 4,563 Medicaid-eligible children enrolled with 10 health plans and 956 KidsCare members enrolled with seven health plans. Overall completion rates for the combined Medicaid and KidsCare samples, along with comparative data, are as follows:

**Summary of Immunization Completion Rates by 24 months of Age (All Members),
For the Measurement Period Ending Sept. 30, 2007**

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib (3 doses)	HBV (3 doses)	VZV (1 dose)	4:3:1 Series	4:3:1:3:3 Series	4:3:1:3:3:1 Series
Current AHCCCS Total (%)	85.6	93.2	94.2	93.5	94.0	92.0	84.4	82.9	81.4
Previous AHCCCS Total (CYE 2005)	84.5	93.0	93.6	85.7	89.5	86.7	82.6	73.2	N/R ¹
AHCCCS and Healthy People 2010 Goals	90	90	90	90	90	90	90 ²	80	80 ²
2006 National Medicaid Mean ³	79.3	87.9	91.1	89.1	88.4	88.9	N/A	N/A	73.4
2006 National Commercial Mean ³	87.2	91.5	93.6	93.5	91.1	90.9	N/A	N/A	79.8

¹ A rate for the 4:3:1:3:3:1 series was not reported for CYE 2005.

² DHHS did not set goals for these vaccine combinations in "Healthy People 2010".

³ Mean (average) for all Medicaid or commercial health plans submitting data to the National Committee for Quality Assurance (NCQA), as reported "The State of Health Care Quality" 2007. These data were collected using HEDIS 2007 specifications for the measurement year ending Dec. 31, 2006. HEDIS does not include measures of the 4:3:1 and 4:3:1:3:3 combinations.

Because of changes to the measurement methodology made by NCQA in 2005 and 2006, current rates are not directly comparable to rates for the previous AHCCCS measurement. However, current rates of completed immunizations for five individual vaccines (IPV, MMR Hib, HBV and VZV), the 4:3:1:3:3 series and the 4:3:1:3:3:1 series surpass AHCCCS and Healthy People 2010 goals. In addition, all AHCCCS rates for the combined Medicaid and KidsCare populations exceed the most recent means for Medicaid health plans reported by NCQA; these means were calculated using the same methodology used by AHCCCS in the current measurement. Except for the measure of DTaP immunization, the AHCCCS combined rates also met or exceeded the most recent means for commercial health plans.

Conclusion

In CYE 2004, AHCCCS implemented a Performance Improvement Project (PIP) for childhood immunizations in order to help ensure continued progress toward AHCCCS and Healthy People 2010 goals. The focused interventions implemented by health plans appear to have had a beneficial effect on overall rates. In addition, changes in HEDIS methodology that eliminated some timing restrictions on when vaccines were administered may have resulted in increased rates in the current measurement. However, this also would be true for the most recent national averages reported by NCQA, which are lower than the AHCCCS rates for nearly all measures.

AHCCCS will provide data from this measurement to Contractors for further analysis and identification of barriers and interventions to improve their performance, as necessary. Contractors should continue efforts to encourage parents to complete immunizations for their children, and to educate them about the safety and efficacy of vaccines.

Contractors also are working to ensure that health care professionals providing immunizations to their members report all vaccinations to ASIIS. This automated registry can be a valuable tool in helping providers determine the immunization status of children they are seeing, so that opportunities to vaccinate are not missed. This is especially important when children receive immunizations at multiple sites and parents do not have current immunization records. In 2005, AHCCCS and its Contractors initiated a PIP to increase provider reporting to ASIIS through consistent education and outreach to primary care practitioners. A measurement conducted by AHCCCS in 2007 showed significant improvement in provider reporting to the registry.

AHCCCS will continue to work with and monitor Contractors, especially those with the lowest rates of childhood immunization, to assist them in making progress toward state and national goals.

References

¹ National Immunization Program. 2005 Annual Report: Immunization for the 21st Century. Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/nip/webutil/about/annual-rpts/ar2005/2005annual-rpt.htm>. Accessed April 19, 2005.

² Institute of Medicine. Financing Vaccines in the 21st Century: Assuring Access and Availability. Washington, D.C. National Academies Press, August 2003. Available at <http://nap.edu>.

³ Coffield A, Maciosek M, McGinnis, et al. Priorities among recommended clinical preventive services. *Am J Prev Med.* 2001;21:1-9.

⁴ U.S. Department of Health and Human Services. Healthy People 2010: Objectives for Improving Health. 2nd ed. Washington, DC: U.S. Government Printing Office, November 2000.

Arizona Health Care Cost Containment System (AHCCCS)

Biennial Report of
IMMUNIZATION COMPLETION RATES AT 24 MONTHS OF AGE
Measurement Period Ending Sept. 30, 2007

I. INTRODUCTION

Background

Routine immunization of children and adults is a safe and cost-effective method of preventing serious and potentially life-threatening diseases.¹⁻³ Many of these diseases, such as measles and varicella (chicken pox), often are considered mild illnesses that are part of childhood. But measles is a highly infectious disease that can cause severe pneumonia, diarrhea, encephalitis (inflammation of the brain) and even death. A resurgence of measles from 1989 to 1991 resulted in more than 55,000 cases in the United States, with 11,000 hospitalizations, 120 deaths, and \$100 million in direct medical care costs.⁴ Similarly, varicella was responsible for 10,000 to 15,000 hospitalizations and more than 100 deaths per year before the vaccine became available.⁵

While successful immunization programs have virtually eliminated the occurrence of measles in the United States, dozens of cases have originated from foreign sources over the past few years (that is, occurring in persons infected outside the U.S.).^{4,6} In January and February 2008, 12 people who had not been vaccinated were infected with measles in an outbreak in San Diego, which was traced to a U.S. resident who was infected abroad.⁷ Virtually all measles cases in the U.S. are linked to imported cases.⁷ The Centers for Disease Control and Prevention (CDC) has found that most of these imported cases could have been prevented through vaccination.^{4,6,8} Given that measles is endemic to most of the world, maintaining immunity to this highly contagious and serious disease through high vaccination coverage levels is very important.⁴

Other diseases also continue to be a problem. In Arizona, an outbreak of pertussis, commonly known as whooping cough, occurred in mid-2005, resulting in at least one infant death. In all, 959 cases of pertussis in the state were reported in 2005, which was 3.5 times the number in the previous year.⁹ In 2006, 508 cases of pertussis were reported in Arizona.⁷ The disease is most dangerous to infants, and may result in death from asphyxia, bronchopneumonia or cerebral complications.

To prevent unnecessary illness, hospitalizations and deaths, high rates of vaccination are necessary – generally 90 percent or greater, according to the CDC.

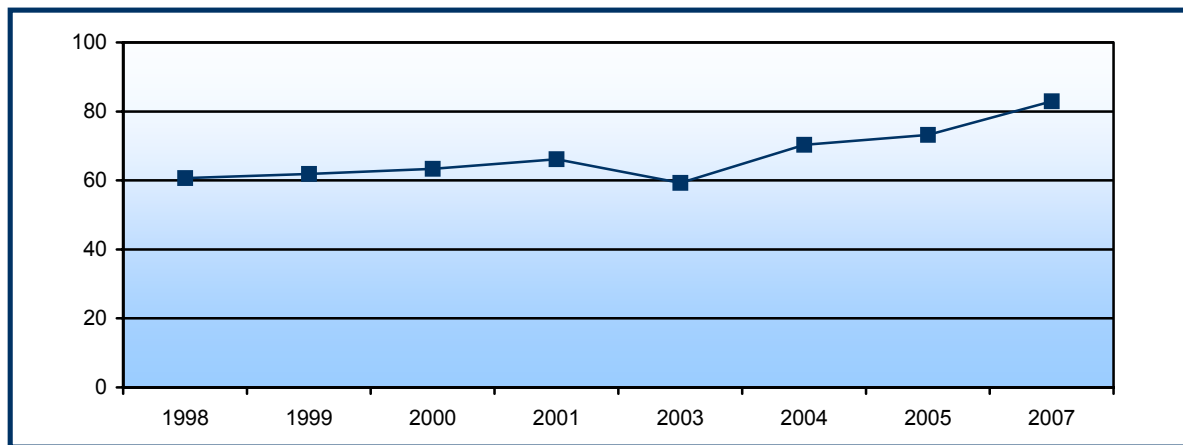
Factors resulting in children not being vaccinated include a lack of awareness about immunization guidelines, refusal due to religious or personal beliefs, and a lack of perceived risks about the dangers of childhood diseases.⁸ Unnecessary fears and misconceptions about the safety and usefulness of vaccines also have prevented some children from being immunized.¹⁰ Despite reports from the Institute of Medicine concluding that there is no convincing evidence to support proposed links between vaccines and diseases such as autism and sudden infant death syndrome (SIDS),^{10,11} parental fears about the safety of immunizations persist. A significant portion of parents who oppose compulsory vaccination believe that vaccines are generally unsafe and not very important to the health of their children.¹²

While all vaccines carry a risk of adverse effects on those who receive them, this risk is minimal compared with the serious health outcomes and possibility of death posed by different diseases (see Appendix A, “Complications from Vaccine-Preventable Diseases vs. Risk of Adverse Reactions from Vaccines”). It is estimated that if measles vaccine were discontinued today, 3 to 4 million cases of the disease would occur annually in the United States, resulting in more than 1,800 deaths, 1,000 cases of encephalitis, and 80,000 cases of pneumonia.⁵ Children who are not fully immunized are not only at risk of contracting infectious diseases, but pose a significant risk of spreading diseases, particularly to those who cannot be vaccinated because of age or medical contraindications.

The CDC recommends that all children be immunized for 15 diseases before 2 years of age. Several of the vaccinations are combined into one “shot.” The current schedule recommends immunization against diphtheria, tetanus, pertussis, poliomyelitis, measles, mumps, rubella, hepatitis B, Haemophilus influenza type b, varicella, pneumococcal disease, influenza, hepatitis A, rotavirus and meningococcal disease. Most vaccines (also referred to as antigens) are given to children between two and 18 months of age (see Appendix B, “Recommended Immunization Schedule for Persons Aged 0–6 Years—United States, 2007”).

Monitoring of immunization completion rates is critical to identifying undervaccinated populations and increasing coverage levels, in order to prevent outbreaks of disease. Since 1993, AHCCCS has regularly measured the vaccination status of children at 24 months of age. As seen in Figure 1, AHCCCS immunization rates increased from 1998 through 2001. They then declined in 2003, likely due to shortages of some vaccines, and began to rise again in 2004.

Figure 1. AHCCCS Overall Rates of Completion for the Five-antigen Vaccine Series (DTaP, IPV, MMR, Hib and HBV), by Contract Year



Rates from 1998 to 2003 include four doses of DTaP, three doses of IPV, one dose of MMR, two doses of Hib and three doses of HBV. In 2004, the combination was revised to include three doses of Hib.

Healthy People and AHCCCS Goals

Based on the CDC’s recommendations, the U.S. Department of Health and Human Services (DHHS) established a goal that, by 2010, 90 percent of children 19 to 35 months of age will be fully vaccinated for universally recommended vaccines. This goal applies to completion of the appropriate doses of individual vaccines. A second goal is that 80 percent of children receive the full series of five vaccines (DTaP, IPV, MMR, Hib and HBV) by age 3.

AHCCCS has adopted long-range goals of 90 percent for completion of individual childhood vaccines and 80 percent for the five-vaccine series by 24 months of age. The agency also sets annual Minimum Performance Standards that contracted health plans (Contractors) should meet for completion of each vaccine and vaccine series, in order to move rates toward these goals.

AHCCCS Performance Standards for Childhood Immunizations

Indicator	Minimum Performance Standard
4:3:1 Series	84%
4:3:1:3:3 Series	74%
DTaP - 4 doses	85%
Polio - 3 doses	90%
MMR - 1 dose	90%
Hib - 3 doses	86%
HBV - 3 doses	90%
Varicella - 1 dose	86%

Standards are specified in the CYE 2007 contract with health plans.

II. PURPOSE OF THE MEASUREMENT

This measurement was conducted to reliably assess the immunization status of AHCCCS members by age 2, as required by state law (*ARS 36-2904*), and to evaluate Contractor performance. This report includes measurement results for 11 childhood diseases, generally using the following vaccines: diphtheria, tetanus, and acellular pertussis (DTaP); inactivated poliovirus (IPV); measles, mumps and rubella (MMR); Haemophilus influenza type b (Hib); hepatitis B virus (HBV), varicella zoster virus (VZV) and pneumococcal conjugate vaccine (PCV).

Rates are reported for the combined Medicaid and KidsCare populations to demonstrate the overall immunization completion status of children enrolled in AHCCCS. In order to evaluate performance by Contractor, completion rates also are reported separately for the Medicaid and KidsCare populations. Results of the current measurement are compared with AHCCCS Minimum Performance Standards and goals, as well as national means and percentiles for Medicaid and commercial health plans.

III. QUALITY INDICATORS

This immunization study is based on Healthcare Effectiveness Data and Information Set (HEDIS) 2007 specifications for measuring childhood immunizations. HEDIS is a widely adopted measure set that is used by approximately 90 percent of managed care organizations in the U.S.

All quality indicators are based on identical denominator criteria. These indicators are listed below with the numerator criteria.

1. DTaP/DT Immunization Rate

The number of children in the denominator who received initial DTaP (diphtheria, tetanus and acellular pertussis) vaccinations followed by at least three DTaP, DT or individual diphtheria and tetanus shots with different dates of service on or before their second birthdays

2. IPV Immunization Rate

The number of children in the denominator who received at least three polio vaccinations (IPV) with different dates of service on or before their second birthdays

3. MMR Immunization Rate

The number of children in the denominator who received at least one measles, mumps and rubella (MMR) vaccination with a date of service on or before their second birthdays

4. Hib Immunization Rate

The number of children in the denominator who received at least three Haemophilus influenza type b vaccinations with different dates of service on or before their second birthdays

5. HBV Immunization Rate

The number of children in the denominator who received at least three hepatitis B virus vaccinations with different dates of service on or before their second birthdays

6. VZV Immunization Rate

The number of children in the denominator who received at least one varicella vaccination with a date of service on or before their second birthdays

7. PCV Immunization rate

The number of children in the denominator who received at least four pneumococcal conjugate vaccinations with different dates of service on or before their second birthdays

8. HEDIS 2007 Combination #2 (4:3:1:3:3:1)

The number of children in the denominator who received four DTaP/DT vaccinations, three IPV vaccinations, one MMR vaccination, three Hib vaccinations, three HBV vaccinations and one VZV vaccination on or before their second birthdays

In addition to the quality indicators specified in HEDIS 2007 methodology, AHCCCS measured some historical combinations for comparisons with previous study results. These include:

9. Traditional 4:3:1 Combination

The number of children in the denominator who received four DTaP/DT vaccinations, three IPV vaccinations, and one MMR vaccination on or before their second birthdays

8. HEDIS 2005 Combination #1 (4:3:1:3:3)

The number of children in the denominator who received four DTaP/DT vaccinations, three IPV vaccinations, one MMR vaccination, three Hib vaccinations and three HBV vaccinations on or before their second birthdays

In accordance with HEDIS criteria, any vaccines administered after 24 months of age were not included in the numerators. Doses of DTaP/DT, IPV, Hib and PCV that were administered prior to 42 days after a child's birth also were not counted, consistent with minimum age restrictions specified in the recommended immunization schedule.

Single doses of combined vaccines — such as TriHiBit[®], which combines DTaP and Hib in one dose, or ComVax[®], which combines Hib and HBV together — were counted as the appropriate individual vaccines.

It also should be noted that, while the CDC recommends vaccination of children for influenza, hepatitis A, rotavirus, and meningococcal disease, these vaccines are not included in current HEDIS measurement methodology.

IV. STUDY METHODS

AHCCCS retained Health Services Advisory Group (HSAG), an external quality review organization, to collect and analyze data for the measurement of childhood immunizations. HSAG has been involved in these assessments for several years.

This measurement included children who turned 2 years old during the contract year ending (CYE) Sept. 30, 2007, and who were enrolled with AHCCCS Contractors and were eligible under Medicaid (Title XIX of the Social Security Act) or KidsCare (Title XXI, the state's Child Health Insurance Program).

Study Sample

AHCCCS identified a representative random sample of children stratified by Contractor, accounting for distribution of members by county. Sample selection was calculated for each Contractor to provide a 95-percent confidence level and 5-percent confidence interval.

The original sample consisted of 5,523 children whose second birthdays occurred on or between Oct. 1, 2006, and Sept. 30, 2007 (i.e., born on or between Oct. 1, 2004, and Sept. 30, 2005), and who had at least 12 months of continuous enrollment with one Contractor prior to, and including, their second birthdays. One gap in enrollment of up to one month was allowed. The original sample included 4,566 Medicaid-eligible children and 957 KidsCare members.

Data Collection

All data were collected according to applicable privacy and confidentiality laws and safeguards. AHCCCS first obtained data from the Arizona State Immunization Information System (ASIIS), an automated registry maintained by the Arizona Department of Health Services (ADHS). AHCCCS provided ASIIS with database files containing the sample cases of Medicaid and KidsCare children. ASIIS staff searched the registry by first name, last name, and date of birth and cross-matched the AHCCCS sample against patients in the registry. ADHS then provided to HSAG all immunization data in the registry for those patients it was able to match.

HSAG calculated immunization completion rates by Contractor, based on the ASIIS data. Sample members were considered complete if they had four doses of DTaP, three doses of IPV, one dose of MMR, three doses of Hib, three doses of HBV, one dose of VZV and four doses of PCV. Overall, 48.8 percent of Medicaid and KidsCare children had complete immunizations based on data contained in the registry, compared with 22.1 percent in the previous measurement (Table 1).

HSAG sorted those members with incomplete or no records found in ASIIS by Contractor and created an Excel spreadsheet for each Contractor, listing the plan's members who had incomplete or no records in ASIIS, and including any vaccination data obtained from ASIIS. HSAG provided each Contractor its data file with instructions for collecting additional data.

AHCCCS allowed Contractors to collect data from two sources: medical records and administrative (claims) information, according to HEDIS methodology. Contractor personnel were trained on the purpose of the study, data collection methods and internal quality control/validation procedures to ensure that data were collected and reported to HSAG in a consistent and reliable manner. Contractors collected the data from source documents and entered it into the Excel files, which were returned to HSAG for analysis. Medical record documentation was retained by Contractors.

Excluded Cases

Two members were excluded from the study during the data collection phase because it was found that their actual dates of birth did not meet the study criteria (i.e., did not occur on or between Oct. 1, 2004, and Sept. 30, 2005). Two other members were excluded because a contraindication to vaccination was documented in their medical records.

Data Analysis

Once data collection was finalized, HSAG merged the data and performed analysis using statistical software. The primary analysis provided results on the percentage of members who were age-appropriately immunized by 24 months for each quality indicator overall, by individual Contractor and by county. Following HEDIS specifications, if the data showed that an individual member received two doses of the same vaccine with dates of service that were within 14 days of each other, the doses were considered a single immunization. This allowed for data from different sources to be combined, while reducing the possibility of counting the same immunization twice due to data entry errors.

Additional analysis was conducted to identify missed opportunities for completion of DTaP vaccination, as this vaccine has historically affected completion rates for the five-antigen series.

Deviations from Previous Methodology

HEDIS 2005 specifications were used for the previous measurement conducted by AHCCCS (measurement period ending Sept. 30, 2005). The 2005 specifications included additional restrictions on when vaccines could be administered in order to count toward the respective numerators, as follows:

- DTaP – at least one dose of diphtheria and tetanus must have been administered on or between a child's first and second birthdays.
- MMR – at least one dose of measles, mumps and rubella vaccine must have been administered on or between a child's first and second birthdays.
- HiB - at least one dose must have been administered on or between the child's first and second birthdays.
- HBV - at least one dose must have been administered on or between six months of age and the child's second birthday.

- VZV - at least one varicella vaccination must have been administered on or between the child's first and second birthdays.

Most of these restrictions were removed from HEDIS specifications in 2005 (for the HEDIS 2006 measure specifications). The requirement that one dose of diphtheria and tetanus be administered on or between a child's first and second birthdays was eliminated in 2006 (HEDIS 2007 specifications).

V. RESULTS

The final sample size consisted of 5,519 children enrolled in AHCCCS. This number included 4,563 Medicaid-eligible children enrolled with 10 health plans and 956 KidsCare members enrolled with seven health plans. Final sample sizes by individual Contractor ranged from 79 to 1,621 cases.

Overall completion rates for the combined Medicaid and KidsCare samples, along with comparative data, are as follows:

Summary of Immunization Completion Rates by 24 months of Age (All Members), For the Measurement Period Ending Sept. 30, 2007

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib (3 doses)	HBV (3 doses)	VZV (1 dose)	4:3:1 Series	4:3:1:3:3 Series	4:3:1:3:3:1 Series
Current AHCCCS Total (%)	85.6	93.2	94.2	93.5	94.0	92.0	84.4	82.9	81.4
Previous AHCCCS Total (CYE 2005)	84.5	93.0	93.6	85.7	89.5	86.7	82.6	73.2	N/R ¹
AHCCCS and Healthy People 2010 Goals	90	90	90	90	90	90	90 ²	80	80 ²
2006 National Medicaid Mean ³	79.3	87.9	91.1	89.1	88.4	88.9	N/A	N/A	73.4
2006 National Commercial Mean ³	87.2	91.5	93.6	93.5	91.1	90.9	N/A	N/A	79.8

¹ A rate for the 4:3:1:3:3:1 series was not reported for CYE 2005.

² DHHS did not set goals for these vaccine combinations in "Healthy People 2010".

³ Mean (average) for all Medicaid or commercial health plans submitting data to the National Committee for Quality Assurance (NCQA), as reported "The State of Health Care Quality" 2007. These data were collected using HEDIS 2007 specifications for the measurement year ending Dec. 31, 2006. HEDIS does not include measures of the 4:3:1 and 4:3:1:3:3 combinations.

Results by Contractor

For the purpose of evaluating Contractor performance, AHCCCS analyzes Medicaid and KidsCare populations separately. For the Medicaid population, nine of 10 Contractors had completion rates for the five-antigen series (4:3:1:3:3) that were above the AHCCCS Minimum Performance Standard for this measure (the remaining Contractor was 0.7 percentage points below the minimum standard). For KidsCare members, all seven Contractors had completion rates that exceeded the AHCCCS minimum standard for this series. Individual vaccine and series rates by Contractor and overall are presented in Tables 2A through 3B.

AHCCCS did not establish Minimum Performance Standards for two of the immunization indicators reported in the current measurement, the 4:3:1:3:3:1 series and PCV; however standards have been set for these indicators for future measurements. The overall rate for the 4:3:1:3:3:1 series was 80.0 percent for Medicaid members and 88.4 percent for KidsCare members. For four doses of PCV, overall rates were 79.9 percent and 89.6 percent for the Medicaid and KidsCare groups, respectively. Rates by Contractor for these two quality indicators are shown in Tables 4 and 5.

Results by County

When analyzed by county, data for the Medicaid and KidsCare populations were combined because several counties had KidsCare samples that were too small to analyze independently. Yuma County had the highest rate of completion of the 4:3:1:3:3 series, at 87.7 percent. Greenlee County, which had only 12 members who met the sample criteria, had the lowest rate, at 50.0 percent. Rates by county are shown in Table 6.

Results by Race/Ethnicity

AHCCCS further analyzed results provided by HSAG for potential disparities among racial/ethnic groups compared with a reference group of non-Hispanic whites. Three measures of immunization completion were analyzed: the 4:3:1:3:3 vaccine series, the DTaP rate (four doses) and the PCV rate (four doses). The vaccine series is a measure of completion of most of the vaccines universally recommended in the first two years of life and is an AHCCCS Performance Measure. DTaP completion also is an AHCCCS Performance Measure and has historically affected completion rates of the vaccine series. The PCV immunization rate is not yet an AHCCCS Performance Measure, but will be in the future and this analysis was performed to assist Contractors in developing any interventions that may be needed to improve rates among specific racial/ethnic populations.

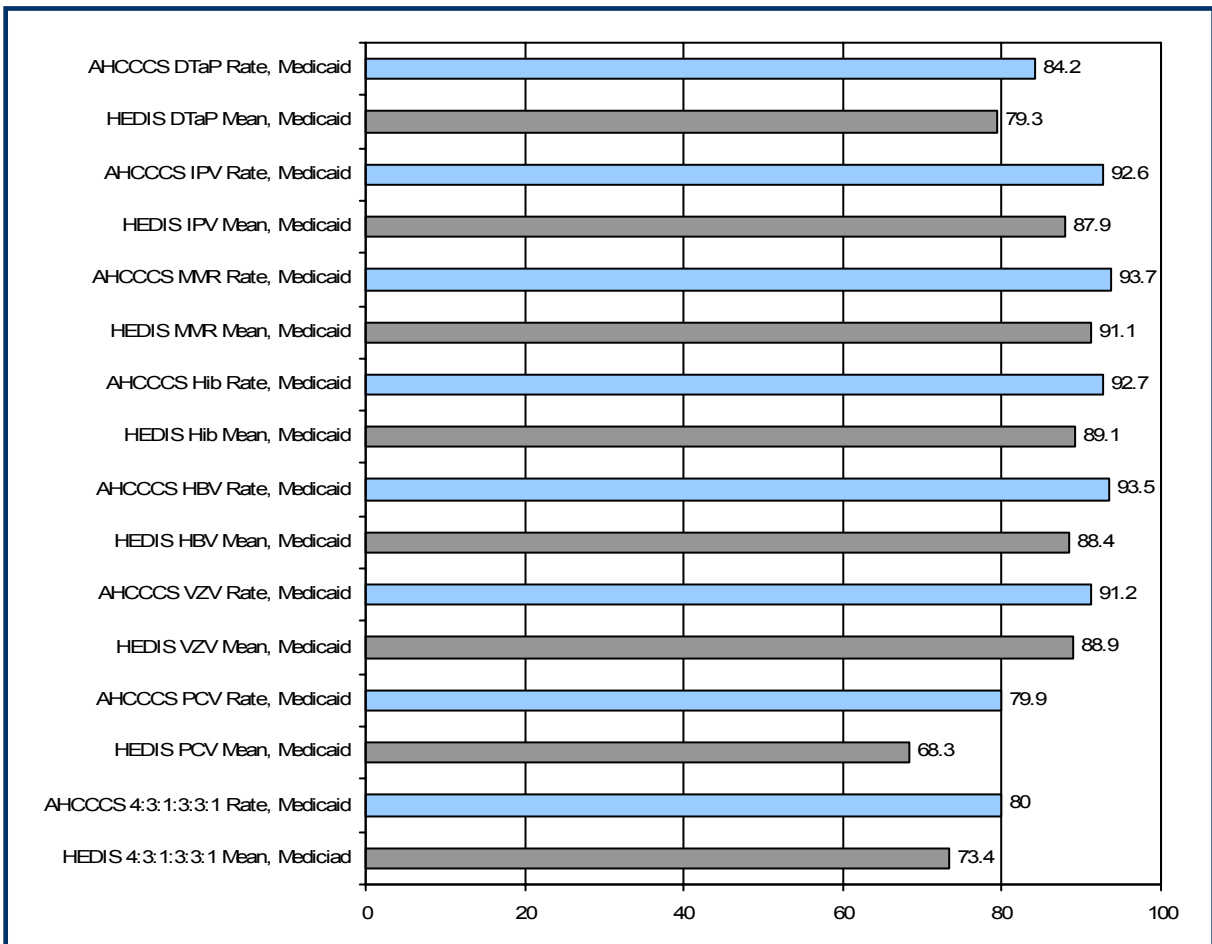
Multivariate analysis of the three measures showed that children identified as Hispanic or “Other” were more likely than non-Hispanic white children to receive the full vaccine series and four doses of each of the individual antigens. The Other category includes Asian/Pacific Islanders and Cuban/Haitians, as these groups did not have large enough populations to be analyzed separately, as well as members for whom race was unknown or unspecified. Based on this analysis, there were no significant differences in rates of immunization among Black and Native American members, compared with non-Hispanic whites (*see Appendix C for statistical results of the analysis by race/ethnicity*).

VI. DISCUSSION

The basic methods used to conduct this study have been used by Medicaid health plans since 1995, and provide a reliable way to measure whether children who have been enrolled in these plans for approximately a year or more are up to date on immunizations by the time they turn 2. Because of recent changes to the measurement methodology made by NCQA, current rates are not directly comparable to rates for the previous AHCCCS measurement. However, current rates of completed immunizations for five individual vaccines (IPV, MMR Hib, HBV and VZV), the 4:3:1:3:3 series and the 4:3:1:3:3:1 series surpass AHCCCS goals and Healthy People 2010 objectives.

In addition, AHCCCS rates for Medicaid members exceed the most recent national means for Medicaid health plans reported by NCQA; these means were calculated using the same methodology used by AHCCCS in the current measurement.

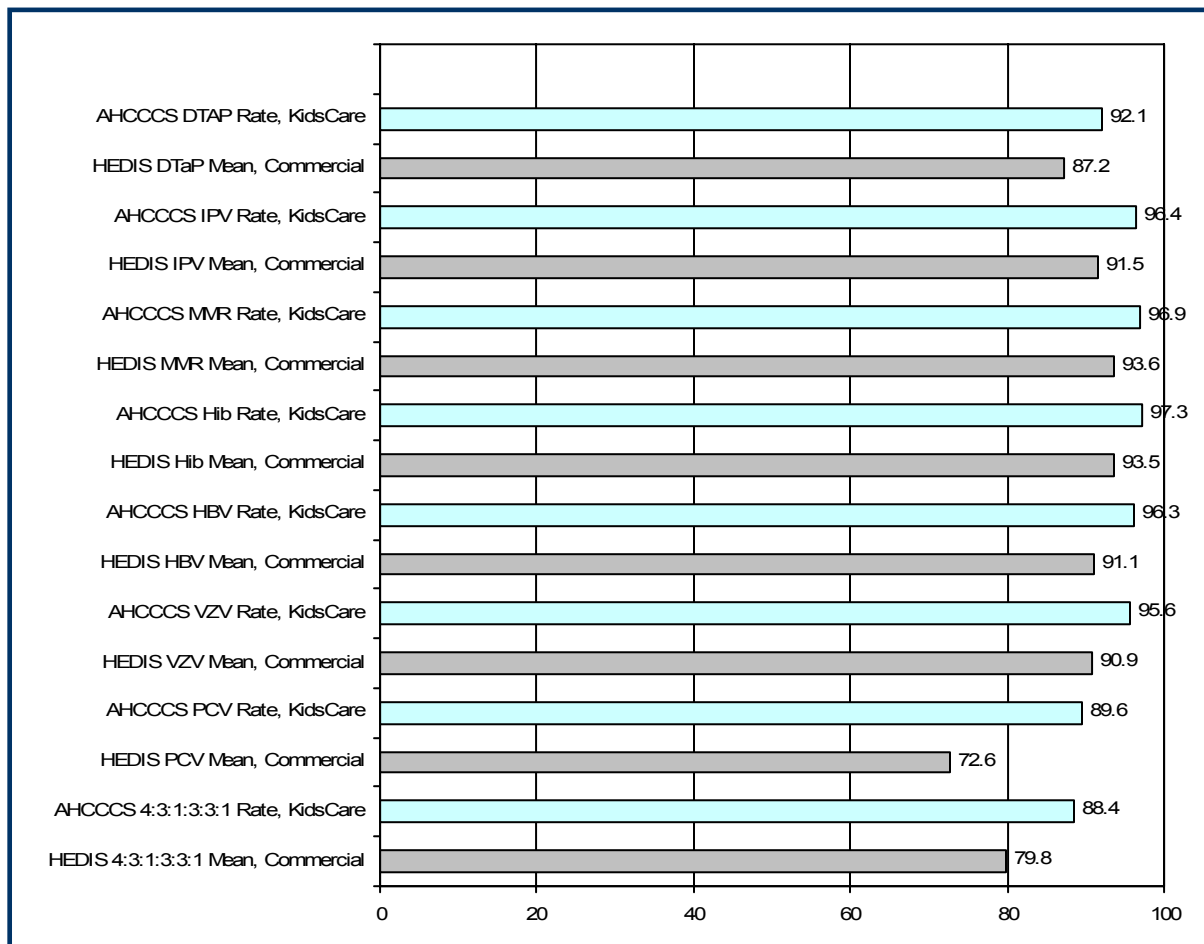
Figure 2. AHCCCS Overall Rates for Medicaid Members Compared with National HEDIS Means for Medicaid Health Plans



Note: AHCCCS Medicaid rates for the CYE 2007 measurement period are compared with the most recent HEDIS Medicaid means reported by NCQA, which are based on HEDIS 2007 specifications for the measurement period of calendar year 2006.

The AHCCCS overall rates for KidsCare members also exceeded the most recent national means for commercial health plans.

Figure 3. AHCCCS Overall Rates for KidsCare Members Compared with National HEDIS Means for Commercial Health Plans



Note: AHCCCS KidsCare rates for the CYE 2007 measurement period are compared with the most recent HEDIS commercial means reported by NCQA, which are based on HEDIS 2007 specifications for the measurement period of calendar year 2006.

When the Medicaid and KidsCare groups are combined, AHCCCS rates also meet or exceed all current means for commercial health plans, except DTaP immunization.

As part of the analysis of results, HSAG calculated Contractor rates for DTaP completion if those children who had gotten three doses of the vaccine had received a fourth dose by their second birthdays. This analysis of possible “missed opportunities” for DTaP vaccination shows that the completion rate for this vaccine among Medicaid members would have increased to 94.8 percent if these members had received just one more dose, compared with the actual completion rate of 84.2 percent (Table 7). The impact of missed opportunities was not as great among KidsCare members, with the possible completion rate calculated to be 98.1 percent, compared with the actual rate of 92.1 percent (Table 8).

II. CONCLUSIONS AND RECOMMENDATIONS

AHCCCS implemented a Performance Improvement Project (PIP) for childhood immunizations in 2004, which included all Acute-care Contractors and DDD, regardless of their level of performance in these measures. The focused interventions implemented over the last few years appear to have had a beneficial effect on overall rates. In addition, changes in HEDIS methodology that eliminated some timing restrictions on when vaccines were administered may have resulted in higher rates in the current measurement. However, these changes also would have affected the current HEDIS national averages in the same manner.

Current results for the 4:3:1:3:3:1 series and PCV are particularly encouraging and show that most Contractors already are performing at a very high level in ensuring completion of these immunizations. It should be noted that the PCV vaccine has been plagued by intermittent supply shortages since its introduction in 2000. An overall completion rate of nearly 80 percent is commendable, and should be maintained by Contractors in the future.

AHCCCS continues to work with Contractors to ensure they meet immunization goals. The following recommendations to improve or maintain immunization completion rates among 2-year-olds enrolled in AHCCCS were compiled from evidence-based research, including strategies developed by the CDC.^{13,14} Most AHCCCS Contractors have implemented several of these strategies, and their continued use should help sustain or further improve performance.

1. Contractors should continue using a variety of means to reach parents/guardians and encourage them to complete their children's immunizations. Mail and telephone reminders to parents and providers have been found to be effective in improving immunization-completion rates. In addition, some Contractors offer incentives, such as a \$25 gift certificate, to parents of children who complete all immunizations by 24 months.

2. In addition to ongoing monitoring of completion of all childhood vaccines, Contractors should focus on rates of DTaP completion, particularly those children who have received only three doses. Given the effect that missing the fourth dose has on completion rates for the 4:3:1:3:3 series, health plans and providers should particularly focus on ensuring that children receive all the necessary doses of this vaccine.

3. Since all childhood vaccines can be completed at about 15 months, Contractors should begin checking the immunization status of members at 12 months of age. If members are lacking doses, this could give parents time to get immunizations completed by the time their children turn 2. Contractors should utilize the CDC's "catch up" immunization schedule, which is included in Appendix B, to help plan for completion of vaccines. When children are overdue, Contractors should consider the additional step of assisting parents/guardians with making appointments with their PCPs and make arrangements for transportation assistance if needed.

4. Contractors should continue or enhance member education to overcome parental fears regarding vaccination. This includes direct communication with members and working with providers to ensure that parents and guardians understand the potential consequences of not having children fully immunized — including seizures, meningitis, hearing impairment and even death due to infectious diseases.

This task remains a challenge for both health plans and providers as celebrities and advocacy groups continue to support claims that the number of vaccinations recommended for children and the ingredients contained in those vaccines are dangerous. A growing number of internet websites contain statements linking vaccinations with specific adverse reactions and chronic diseases such as multiple sclerosis, autism, and diabetes; claims that vaccines provide only temporary protection and that the diseases prevented are mild; and allegations of cover-ups to hide the truth about vaccine safety.¹⁵ While no scientific link has been found between vaccines and autism, and the safety of immunizations have been thoroughly tested, such claims undermine efforts to achieve optimum vaccination coverage levels.

Contractors should use and encourage their network providers to utilize resources from the CDC's National Immunization Program (NIP), such as Vaccine Information Statements, which provide easy-to-understand information on the benefits and risks of specific vaccines. A Vaccine Information Statement (VIS) must be provided to the recipient of any vaccine covered by the National Childhood Vaccine Injury Act (NVCIA), which includes most immunizations given in childhood, and are available for all vaccines licensed in the U.S. Copies of VISs are available from state health authorities responsible for immunization, or they can be obtained from the CDC's website (<http://www.cdc.gov/nip>) or from the Immunization Action Coalition (<http://www.immunize.org>). Translations of VISs into languages other than English also are available from the Immunization Action Coalition website and may be available from state immunization programs.

Other resources include the CDC's *Epidemiology and Prevention of Vaccine Preventable Diseases*, known as the "Pink Book," which includes strategies for providers to increase immunization rates in their practices, as well as to address questions and myths regarding vaccine safety. "When a parent or patient initiates discussion regarding a vaccine concern, the health care provider should discuss the specific concern and provide factual information, using language that is appropriate," advises the CDC. "Effective, empathetic vaccine risk communication is essential in responding to misinformation and concerns." The CDC further notes that Vaccine Information Statements provide an outline for discussing vaccine benefits and risk, and recommends the use of two fact sheets, "Vaccines a Safe Choice" and "Helping Parents Who Question Vaccines" (available at <http://www.cdc.gov/nip>).¹³

5. Contractors should target outreach activities in specific geographic areas, as needed.

Results for the current measurement show that immunization rates for the 4:3:1:3:3 series were lowest in Greenlee, Mohave, Apache, Navajo and Pinal counties. Contractors that serve these counties should work to bring rates in these areas up, including working with providers and possibly county health departments to identify barriers to immunization and resources to address those barriers. Provider education in vaccine management and delivery, as well as strategies to encourage parents to complete immunizations on time, may be helpful. Such resources are available through The Arizona Partnership for Immunization (<http://www.whyimmunize.org>) and the Arizona Department of Health Services (<http://www.azdhs.gov/phs/immun>).

AHCCCS, TAPI, ADHS, the Pinal County Health and Human Services Department, and two Contractors that serve Pinal County have begun collaborating on ways to improve childhood immunization rates in the county, which showed one of the lowest rates for 4:3:1:3:3 completion in the previous study. It is hoped that these efforts will show results in the next measurement.

6. Contractors should continue to ensure that health care professionals providing immunizations report all vaccinations to ASIIS. With complete reporting, this automated registry could be a valuable tool in helping providers determine the immunization status of children they are seeing at any visit, so that opportunities to vaccinate are not missed. This is especially important when children receive immunizations at multiple sites and parents do not have current immunization records. Use of ASIIS to check patients' immunization status should prevent the need for them to return for vaccinations.

In 2005, AHCCCS and its Contractors initiated a PIP to increase provider reporting to ASIIS through consistent education and outreach to primary care practitioners. A measurement conducted by AHCCCS in 2007 showed significant improvement in provider reporting to the registry.

7. Contractors should consider assessing immunization rates at the provider level and provide feedback to physicians and office staff. These assessments could be tied to incentives for practices that meet immunization-completion standards.

AHCCCS and its Contractors will continue to monitor immunization coverage levels among children. AHCCCS also will continue to work with low-performing Contractors to ensure they meet contractual standards and goals.

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**Table 1. Complete* Records in the
Arizona State Immunization Information System (ASIS), by Contractor:
All Members, (Medicaid and KidsCare)
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	Complete Records Found in ASIS	Percent of Complete Records Found in ASIS
Arizona Physicians IPA	1,621	754	46.5
	1,977	462	23.4
Care1st Health Plan AZ	288	204	70.8
	178	30	16.9
DESCMDP	326	116	35.6
	299	36	12.0
DES/DDD	97	39	40.2
	115	17	14.8
Health Choice Arizona	1,026	580	56.5
	986	186	18.9
Maricopa Health Plan	242	120	49.6
	275	96	34.9
Mercy Care Plan	1,068	450	42.1
	1,167	259	22.2
Phoenix Health Plan	534	304	56.9
	511	152	29.7
Pima Health System	238	91	38.2
	250	37	14.8
University Family Care	79	33	41.8
	177	34	19.2
TOTAL	5,519	2,691	48.8
PREVIOUS TOTAL	5,935	1309	22.1

* Sample members were considered complete if they had four doses of DTaP, three doses of IPV, one dose of MMR, three doses of Hib, three doses of HBV, one dose of VZV and four doses of pneumococcal conjugate vaccine, based on data reported to ASIS.

Shaded rows include previous results (measurement period ending CYE 2005).

**Table 2A. Immunization Completion Rates by 24 Months of Age, by Contractor:
Individual Vaccines, Members covered under Medicaid
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE					
		4 DTaP	3 IPV	1 MMR	3 Hib	3 HBV	1 VZV
Arizona Physicians IPA	1,353	81.5	91.1	91.5	91.7	92.6	89.1
	1,600	80.7	89.9	90.7	82.8	87.8	80.7
Care1st Health Plan	224	95.1	97.8	98.2	97.3	99.1	98.2
	166	74.1	89.8	89.8	84.3	86.1	80.7
DES/CMDP	326	81.3	89.3	95.4	91.4	88.0	92.6
	299	76.6	87.6	91.0	73.2	77.3	86.0
DES/DDD	97	89.7	95.9	95.9	89.7	92.8	94.8
	115	73.0	84.3	84.3	81.7	83.5	82.6
Health Choice Arizona	846	85.1	91.7	92.9	91.8	92.9	89.7
	894	82.6	93.0	92.1	74.3	87.0	81.8
Maricopa Health Plan	201	86.1	96.5	96.0	97.0	98.0	95.5
	228	84.6	95.6	93.9	88.6	84.6	89.9
Mercy Care Plan	826	86.4	93.0	94.9	93.0	93.6	92.0
	978	84.3	91.4	93.4	88.2	90.1	87.9
Phoenix Health Plan	404	79.5	92.3	93.3	92.3	94.6	91.3
	407	83.3	92.6	94.1	87.7	88.5	85.3
Pima Health System	207	89.4	97.6	95.7	95.7	96.6	92.8
	231	94.4	98.3	97.8	96.1	93.1	95.7
University Family Care	79	78.5	96.2	93.7	92.4	98.7	87.3
	175	87.4	94.9	96.0	89.1	92.6	86.9
TOTAL	4,563	84.2	92.6	93.7	92.7	93.5	91.2
PREVIOUS TOTAL	5,253	83.5	92.7	93.2	84.9	89.2	86.0

Shaded rows include previous results (measurement period ending CYE 2005).

Immunization completion rates for the current measurement shown in bold face indicate the Contractor met or exceeded the AHCCCS Minimum Performance Standard.

**Table 2B. Immunization Completion Rates by 24 Months of Age, by Contractor:
Vaccine Series, Members covered under Medicaid
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE	
		Traditional DTaP, IPV & MMR Rate (4:3:1)	DTaP, IPV, MMR, Hib & HBV (4:3:1:3:3)
Arizona Physicians IPA	1,353	80.0	78.7
	1,760	83.0	76.4
Care1st Health Plan	224	94.6	94.6
	166	72.3	66.3
DES/CMDP	326	78.2	73.3
	299	71.9	53.2
DES/DDD	97	87.6	81.4
	115	71.3	65.2
Health Choice Arizona	846	84.3	83.3
	894	80.4	62.1
Maricopa Health Plan	201	86.1	86.1
	228	84.6	72.8
Mercy Care Plan	826	85.2	83.5
	978	82.8	76.2
Phoenix Health Plan	404	78.2	77.7
	407	81.1	74.4
Pima Health System	207	88.4	87.4
	231	92.6	84.4
University Family Care	79	78.5	77.2
	175	85.1	76.6
TOTAL	4,563	83.0	81.5
PREVIOUS TOTAL	5,253	81.7	72.1

Shaded rows include previous results (measurement period ending CYE 2005).

Immunization completion rates for the current measurement shown in bold face indicate the Contractor met or exceeded the AHCCCS Minimum Performance Standard.

**Table 3A. Immunization Completion Rates by 24 Months of Age, by Contractor:
Individual Vaccines, Members covered under KidsCare
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATION COMPLETED BY 24 MONTHS OF AGE					
		4 DTaP	3 IPV	1 MMR	3 Hib	3 HBV	1 VZV
Arizona Physicians IPA	268	89.9	95.1	94.8	95.5	95.5	93.7
	217	92.2	94.5	95.4	91.7	96.3	88.5
Care1st Health Plan	64	100.0	98.4	100.0	100.0	100.0	100.0
	12	100.0	100.0	100.0	100.0	100.0	100.0
Health Choice Arizona	180	93.3	97.8	97.8	99.4	97.2	96.1
	92	84.8	91.3	95.7	84.8	82.6	87.0
Maricopa Health Plan	41	95.1	100.0	97.6	100.0	100.0	97.6
	47	89.4	97.9	95.7	93.6	87.2	97.9
Mercy Care Plan	242	92.6	97.9	97.5	97.1	95.9	95.9
	189	93.1	96.8	97.9	94.7	91.5	93.7
Phoenix Health Plan	130	90.8	93.1	96.9	96.2	94.6	96.9
	104	95.2	98.1	98.1	93.3	93.3	96.2
Pima Health System	31	83.9	93.5	96.8	96.8	96.8	90.3
	19	100.0	94.7	94.7	100.0	89.5	94.7
TOTAL	956	92.1	96.4	96.9	97.3	96.3	95.6
PREVIOUS TOTAL	682	92.1	95.6	96.6	92.4	91.9	91.9

Shaded rows include previous results (measurement period ending CYE 2005).

Immunization completion rates for the current measurement shown in bold face indicate the Contractor met or exceeded the AHCCCS Minimum Performance Standard.

Note: DES/CMDP, DES/DDD and University Family Care did not have any KidsCare members who met the study selection criteria.

**Table 3B. Immunization Completion Rates by 24 Months of Age, by Contractor:
Vaccine Series, Members covered under KidsCare
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATION COMPLETED BY 24 MONTHS OF AGE	
		Traditional DTaP, IPV & MMR RATE (4:3:1)	DTaP, IPV, MMR, Hib & HBV (4:3:1:3:3)
Arizona Physicians IPA	268	89.2	87.7
	217	88.0	83.4
Care 1st HealthPlan	64	98.4	98.4
	12	100.0	100.0
Health Choice Arizona	180	92.2	90.6
	92	80.4	67.4
Maricopa Health Plan	41	95.1	95.1
	47	89.4	80.9
Mercy Care Plan	242	92.1	90.1
	189	93.1	84.7
Phoenix Health Plan	130	89.2	88.5
	104	94.2	84.6
Pima Health System	31	83.9	80.6
	19	89.5	84.2
TOTAL	956	91.2	89.7
PREVIOUS TOTAL	682	89.7	82.0

Shaded rows include previous results (measurement period ending CYE 2005).

Immunization completion rates for the current measurement shown in bold face indicate the Contractor met or exceeded the AHCCCS Minimum Performance Standard.

Note: DES/CMDP, DES/DDD and University Family Care did not have any KidsCare members who met the study selection criteria.

**Table 4. Immunization Completion Rates by 24 Months of Age, by Contractor:
4:3:1:3:3:1 Vaccine Series and PCV (four doses), Medicaid Members
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE	
		DTaP, IPV, MMR, Hib, HBV& VZV Rate (4:3:1:3:3:1)	Pneumococcal Conjugate Vaccine (4 doses)
Arizona Physicians IPA	1,353	76.7	76.3
Care1st Health Plan	224	94.6	91.1
DES/CMDP	326	72.1	76.4
DES/DDD	97	81.4	81.4
Health Choice Arizona	846	81.6	79.2
Maricopa Health Plan	201	86.1	86.6
Mercy Care Plan	826	81.5	82.2
Phoenix Health Plan	404	77.0	78.5
Pima Health System	207	86.0	86.5
University Family Care	79	75.9	78.5
TOTAL	4,563	80.0	79.9

**Table 5. Immunization Completion Rates by 24 Months of Age, by Contractor:
4:3:1:3:3:1 Vaccine Series and PCV (four doses), KidsCare Members
For the Contract Year Ending September 30, 2007**

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE	
		DTaP, IPV, MMR, Hib, HBV & VZV Rate (4:3:1:3:3:1)	Pneumococcal Conjugate Vaccine (4 doses)
Arizona Physicians IPA	268	85.8	85.4
Care1st Health Plan	64	98.4	98.4
Health Choice Arizona	180	88.9	91.7
Maricopa Health Plan	41	95.1	85.4
Mercy Care Plan	242	88.4	90.5
Phoenix Health Plan	130	88.5	90.0
Pima Health System	31	77.4	93.5
TOTAL	956	88.4	89.6

Note: DES/CMDP, DES/DDD and University Family Care did not have any KidsCare members who met the study selection criteria.

**Table 6. Immunization Completion Rates by 24 Months of Age, by County:
4:3:1:3:3 Vaccine Series, All Members (Medicaid and KidsCare)
For the Contract Year Ending September 30, 2007**

County	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE
		DTaP, IPV, MMR, Hib & HBV (4:3:1:3:3)
Apache	68	73.5
	56	74.5
Cochise	234	80.8
	298	70.1
Coconino	192	86.5
	228	78.3
Gila	93	82.8
	126	67.8
Graham	102	86.3
	119	69.6
Greenlee	12	50.0
	23	78.3
La Paz	48	85.4
	41	77.5
Maricopa	2,183	84.6
	2,191	72.1
Mohave	273	70.3
	248	70.0
Navajo	167	73.7
	159	59.2
Pima	1,044	86.2
	1,242	71.5
Pinal	313	76.4
	300	59.4
Santa Cruz	159	82.4
	190	80.6
Yavapai	289	79.2
	307	75.3
Yuma	342	87.7
	407	82.0
TOTAL	5,519	82.9
	5,935	73.2

Shaded rows include previous results (measurement period ending CYE 2005).

**Table 7. Potential Missed Opportunities in DTaP Completion Rates, by Contractor:
Medicaid Members
For the Contract Year Ending Sept. 30, 2007**

AHCCCS Contractor	Final Sample Size	DTaP Complete (4 Doses)		3 DTaP Doses		Potential Completion Rate	
		#	%	#	%	#	%
Arizona Physicians IPA	1,353	1,103	81.5	165	12.2	1,268	93.7
	1,760	1,487	84.5	203	11.5	1,690	96.0
Care1st Health Plan	224	213	95.1	7	3.1	220	98.2
	166	123	74.1	30	18.1	153	92.2
DES/CMDP	326	265	81.3	48	14.7	313	96.0
	299	229	76.6	48	16.1	277	92.6
DES/DDD	97	87	89.7	7	7.2	94	96.9
	115	84	73.0	19	16.5	103	89.6
Health Choice Arizona	846	720	85.1	65	7.7	785	92.8
	894	738	82.6	109	12.2	847	94.7
Maricopa Health Plan	201	173	86.1	24	11.9	197	98.0
	228	193	84.6	26	11.4	219	96.1
Mercy Care Plan	826	714	86.4	72	8.7	786	95.2
	978	824	84.3	96	9.8	920	94.1
Phoenix Health Plan	404	321	79.5	62	15.3	383	94.8
	407	339	83.3	45	11.1	384	94.3
Pima Health System	207	185	89.4	19	9.2	204	98.6
	231	218	94.4	11	4.8	229	99.1
University Family Care	79	62	78.5	14	17.7	76	96.2
	175	153	87.4	19	10.9	172	98.3
TOTAL	4,563	3,843	84.2	483	10.6	4,326	94.8
	5,253	4,388	83.5	606	11.5	4,994	95.1

Shaded rows include previous results (measurement period ending CYE 2005).

**Table 8. Potential Missed Opportunities in DTaP Completion Rates, by Contractor:
KidsCare Members
For the Contract Year Ending Sept. 30, 2007**

AHCCCS Contractor	Final Sample Size	DTaP Complete (4 Doses)		3 DTaP Doses		Potential Completion Rate	
		#	%	#	%	#	%
Arizona Physicians IPA	268	241	89.9	20	7.5	261	97.4
	217	200	92.2	15	6.9	215	99.1
Care1st Health Plan	64	64	100.0	0	0.0	64	100.0
	12	12	100.0	0	0.0	12	100.0
Health Choice Arizona	180	168	93.3	11	6.1	179	99.4
	92	78	84.8	10	10.9	88	95.7
Maricopa Health Plan	41	39	95.1	2	4.9	41	100.0
	47	42	89.4	4	8.5	46	97.9
Mercy Care Plan	242	224	92.6	13	5.4	237	97.9
	189	176	93.1	8	4.2	184	97.4
Phoenix Health Plan	130	118	90.8	7	5.4	125	96.2
	104	99	95.2	4	3.8	103	99.0
Pima Health System	31	26	83.9	5	16.1	31	100.0
	19	19	100.0	0	0.0	19	100.0
TOTAL	956	880	92.1	58	6.1	938	98.1
	682	628	92.1	41	6.0	669	98.1

Shaded rows include previous results (measurement period ending CYE 2005).

Note: DES/CMDP, DES/DDD and University Family Care did not have any KidsCare members who met the study selection criteria.

Appendix A
Risk of Complications from Vaccine-Preventable Diseases vs.
Risk of Adverse Reactions from Vaccines

DISEASE	CLINICAL FEATURES	COMPLICATIONS
Diphtheria	Cold-like symptoms, such as sore throat, anorexia, and low-grade fever. Respiratory obstruction may occur. Eventually the tonsils and soft palate will be covered with a bluish-white membrane	The most common complications are myocarditis (characterized by abnormal cardiac rhythms, which can lead to death), and neuritis (affects motor nerves, secondary pneumonia and respiratory failure may result from paralysis of the diaphragm). Other complications include otitis media (ear infection) and respiratory insufficiency due to airway obstruction, especially in infants. Death rate is up to 20 percent among children younger than 5 years.
Tetanus	Lockjaw, stiffness of the neck, difficulty swallowing, rigid abdominal muscles, fever, hypertension, and tachycardia. Complete recovery can take months.	Laryngospasm (spasm of the vocal chords and/or muscles of respiration, which may result in difficulty breathing), fractures of the spine or long bones due to sustained contractions and convulsions, hyperactivity of the autonomic nervous system (may lead to hypertension and/or abnormal heart rhythm), nosocomial infection (related to long hospitalization), pulmonary embolism, and aspiration pneumonia. Death occurs in about 11 percent of cases.
Pertussis	Cold-like symptoms (first stage), coughing spells that end in a high-pitched whoop, and may result in cyanosis in which the patient turns blue (second stage). Vomiting and exhaustion usually follow coughing episodes.	Seizures, encephalopathy, secondary bacterial pneumonia resulting in death occurs in approximately 12 percent of infants younger than six months. Neurologic complications also are more common among infants. Other complications include otitis media, anorexia, dehydration and pressure injuries due to severe coughing.
Poliomyelitis (polio)	Response to infection is highly variable and may consist of minor, non-specific illness, including sore throat and fever, nausea, vomiting, abdominal pain, constipation, or diarrhea; or influenza-like illness. Other forms include stiffness of the neck, back and/or legs, and paralytic illness.	Nonparalytic aseptic meningitis, flaccid paralysis (diminished deep tendon reflexes). Death rate ranges from 2 percent to 75 percent, depending on age and severity of the illness.

Measles	Rash, fever, cough, runny nose, Koplik's spots (blue-white spots on the buccal mucosa), cold-like symptoms, anorexia, diarrhea, generalized lymphadenopathy and conjunctivitis (eye infection)	Diarrhea, otitis media, pneumonia, and encephalitis. subacute sclerosing panencephalitis (SSPE), a rare degenerative central nervous system disorder is believed to be caused by persistent measles virus infection of the brain. Measles during pregnancy can result in premature labor, spontaneous abortion and low birth weight. Death occurs in 0.2 percent of cases, with the risk of death higher in young children.
Mumps	Non-specific illness consisting of low-grade fever, headache, malaise, myalgia; parotitis (manifested as ear ache and tenderness of the jaw)	Central nervous system involvement (meningitis or encephalitis); orchitis (testicular inflammation), oophoritis (ovarian inflammation), myocarditis, pancreatitis, and hyperglycemia. Less common complications are deafness, arthralgia, arthritis and nephritis. Death occurs in 1 to 3 in 10,000 cases.
Rubella	Low-grade fever, malaise, swollen glands and upper respiratory infection prior to a rash; conjunctivitis, testalgia or orchitis	Abortion (both surgical and spontaneous); gastrointestinal, cerebral or intrarenal hemorrhage; encephalitis; arthralgia and arthritis occur frequently in adults. Congenital rubella syndrome (CRS) includes deafness, blindness and mental retardation in newborns.
Haemophilus influenzae type b (Hib)	Meningitis (infection of membranes covering the brain, including fever, decreased mental status and stiff neck), epiglottitis (infection and swelling of the tissue that covers the larynx during swallowing, and may cause life-threatening airway obstruction), pneumonia, otitis media, arthritis, cellulitis (rapidly progressing skin infection that usually involves the face, head or neck), osteomyelitis (bone infection) and pericarditis (infection of the sac covering the heart)	Meningitis, epiglottitis, pneumonia, arthritis, cellulitis, osteomyelitis and bacteremia. Others experience hearing impairment or neurologic sequelae, and death occurs in 2 to 5 percent of cases.
Hepatitis B (HBV)	Malaise, anorexia, nausea, vomiting, right upper quadrant abdominal pain, fever, headache, myalgias, skin rashes, arthralgias, arthritis and dark urine, progressing to jaundice, tenderness and enlargement of the liver; fatigue, which may persist for weeks or months	Chronic infection and malaise/fatigue for weeks and /or months, chronic hepatitis, cirrhosis of the liver, liver failure and carcinoma. Up to 4,000 people in the United States die each year from hepatitis B-related cirrhosis and up to 1,500 die from related liver cancer.
Varicella (VZV - also known as Chicken Pox)	Fever, malaise, rash (with lesions on mucous membranes that may rupture and become purulent before drying and crusting over), and pruritus (itching) . Herpes Zoster (shingles) occurs when the VZV reactivates.	Secondary bacterial infection, pneumonia, central nervous system symptoms (aseptic meningitis, encephalitis) and Reye's syndrome. If a woman develops varicella within five days of delivery, the neonate has a 30 percent chance of death.

No vaccine is perfectly safe or effective. Approximately 10,000 cases of adverse health effects are reported to the CDC through the Vaccine Adverse Event Reporting System (VAERS) each year. Research is under way by the U. S. Public Health Service to better understand which vaccine adverse events are truly caused by vaccines (or are coincidental to their administration) and how to reduce the already low risk of serious vaccine-related injury.

Children are far more likely to be injured by a vaccine-preventable disease than by the vaccine. Still, some parents refuse to have their children immunized because of the possibility of adverse reaction to a vaccine. Below is a comparison of risks from some diseases and risks from the associated vaccines.

Risk from Disease vs. Risk from Vaccines	
<u>Disease</u>	<u>Vaccine</u>
<u>Diphtheria</u> Death: 1 in 20 <u>Tetanus</u> Death: 3 in 100 <u>Pertussis</u> Pneumonia: 1 in 8 Encephalitis: 1 in 20 Death: 1 in 200	<u>DTaP</u> Fever greater than 101°: 3 to 5 in 100 Swelling at injection site: 2 to 29 in 100
<u>Measles</u> Pneumonia: 1 in 20 Encephalitis: 1 in 2,000 Death: 1 in 3,000 <u>Mumps</u> Encephalitis: 1 in 300 <u>Rubella</u> Congenital Rubella Syndrome: 1 in 4 if mother is infected early in pregnancy	<u>MMR</u> Encephalitis or severe allergic reaction: 1 in 1 million

Source: Centers for Disease Control and Prevention, Epidemiology and Prevention of Vaccine-Preventable Diseases, Seventh Edition (second printing), January 2005

Appendix B
Recommended Immunization Schedule for Persons Aged 0 – 6 Years:
United States, 2007

Recommended Immunization Schedule for Persons Aged 0–6 Years—UNITED STATES • 2007

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B ¹	HepB	HepB	HepB	see footnote 1	HepB	HepB	HepB	HepB	HepB	HepB Series		
Rotavirus ²				Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis ³			DTaP	DTaP	DTaP	DTaP	DTaP	DTaP	DTaP			DTaP
<i>Haemophilus influenzae</i> type b ⁴			Hib	Hib	Hib ⁴	Hib	Hib	Hib	Hib	Hib		
Pneumococcal ⁵			PCV	PCV	PCV	PCV	PCV	PCV	PCV	PCV	PPV	
Inactivated Poliovirus			IPV	IPV	IPV	IPV	IPV	IPV	IPV	IPV		
Influenza ⁶							Influenza (Yearly)					
Measles, Mumps, Rubella ⁷							MMR	MMR	MMR	MMR	MMR	MMR
Varicella ⁸							Varicella	Varicella	Varicella	Varicella	Varicella	Varicella
Hepatitis A ⁹							HepA (2 doses)			HepA Series		
Meningococcal ¹⁰											MPSV4	

Range of recommended ages

Catch-up immunization

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 0–6 years. Additional information is available at <http://www.cdc.gov/nip/recs/child-schedule.htm>. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and

other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective Advisory Committee on Immunization Practices statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

1. Hepatitis B vaccine (HepB). (Minimum age: birth)

At birth:

- Administer monovalent HepB to all newborns before hospital discharge.
- If mother is hepatitis surface antigen (HBsAg)-positive, administer HepB and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth.
- If mother's HBsAg status is unknown, administer HepB within 12 hours of birth. Determine the HBsAg status as soon as possible and if HBsAg-positive, administer HBIG (no later than age 1 week).
- If mother is HBsAg-negative, the birth dose can only be delayed with physician's order and mother's negative HBsAg laboratory report documented in the infant's medical record.

After the birth dose:

- The HepB series should be completed with either monovalent HepB or a combination vaccine containing HepB. The second dose should be administered at age 1–2 months. The final dose should be administered at age ≥24 weeks. Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg after completion of ≥3 doses of a licensed HepB series, at age 9–18 months (generally at the next well-child visit).

4-month dose:

- It is permissible to administer 4 doses of HepB when combination vaccines are administered after the birth dose. If monovalent HepB is used for doses after the birth dose, a dose at age 4 months is not needed.

2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)

- Administer the first dose at age 6–12 weeks. Do not start the series later than age 12 weeks.
- Administer the final dose in the series by age 32 weeks. Do not administer a dose later than age 32 weeks.
- Data on safety and efficacy outside of these age ranges are insufficient.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). (Minimum age: 6 weeks)

- The fourth dose of DTaP may be administered as early as age 12 months, provided 6 months have elapsed since the third dose.
- Administer the final dose in the series at age 4–6 years.

4. *Haemophilus influenzae* type b conjugate vaccine (Hib). (Minimum age: 6 weeks)

- If PRP-OMP (PedvaxHIB[®] or ComVax[®] [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required.
- TriHiBit[®] (DTaP/Hib) combination products should not be used for primary immunization but can be used as boosters following any Hib vaccine in children aged ≥12 months.

5. Pneumococcal vaccine. (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPV])

- Administer PCV at ages 24–59 months in certain high-risk groups. Administer PPV to children aged ≥2 years in certain high-risk groups. See *MMWR* 2000;49(No. RR-9):1–35.

6. Influenza vaccine. (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 5 years for live, attenuated influenza vaccine [LAIV])

- All children aged 6–59 months and close contacts of all children aged 0–59 months are recommended to receive influenza vaccine.
- Influenza vaccine is recommended annually for children aged ≥59 months with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at high risk. See *MMWR* 2006;55(No. RR-10):1–41.
- For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
- Children receiving TIV should receive 0.25 mL if aged 6–35 months or 0.5 mL if aged ≥3 years.
- Children aged <9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).

7. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- Administer the second dose of MMR at age 4–6 years. MMR may be administered before age 4–6 years, provided ≥4 weeks have elapsed since the first dose and both doses are administered at age ≥12 months.

8. Varicella vaccine. (Minimum age: 12 months)

- Administer the second dose of varicella vaccine at age 4–6 years. Varicella vaccine may be administered before age 4–6 years, provided that ≥3 months have elapsed since the first dose and both doses are administered at age ≥12 months. If second dose was administered ≥28 days following the first dose, the second dose does not need to be repeated.

9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- HepA is recommended for all children aged 1 year (i.e., aged 12–23 months). The 2 doses in the series should be administered at least 6 months apart.
- Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits.
- HepA is recommended for certain other groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.

10. Meningococcal polysaccharide vaccine (MPSV4). (Minimum age: 2 years)

- Administer MPSV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. See *MMWR* 2005;54(No. RR-7):1–21.

Catch-up Immunization Schedule

UNITED STATES • 2007

for Persons Aged 4 Months–18 Years Who Start Late or Who Are More Than 1 Month Behind

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age.

CATCH-UP SCHEDULE FOR PERSONS AGED 4 MONTHS–6 YEARS					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B ¹	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Rotavirus ²	6 wks	4 weeks	4 weeks		
Diphtheria, Tetanus, Pertussis ³	6 wks	4 weeks	4 weeks	6 months	6 months ³
<i>Haemophilus influenzae</i> type b ⁴	6 wks	4 weeks if first dose administered at age <12 months 8 weeks (as final dose) if first dose administered at age 12–14 months No further doses needed if first dose administered at age ≥15 months	4 weeks ⁴ if current age <12 months 8 weeks (as final dose) ⁴ if current age ≥12 months and second dose administered at age <15 months No further doses needed if previous dose administered at age ≥15 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Pneumococcal ⁵	6 wks	4 weeks if first dose administered at age <12 months and current age <24 months 8 weeks (as final dose) if first dose administered at age ≥12 months or current age 24–59 months No further doses needed for healthy children if first dose administered at age ≥24 months	4 weeks if current age <12 months 8 weeks (as final dose) if current age ≥12 months No further doses needed for healthy children if previous dose administered at age ≥24 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	4 weeks ⁶	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	3 months			
Hepatitis A ⁹	12 mos	6 months			
CATCH-UP SCHEDULE FOR PERSONS AGED 7–18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis ¹⁰	7 yrs ¹⁰	4 weeks	8 weeks if first dose administered at age <12 months 6 months if first dose administered at age ≥12 months	6 months if first dose administered at age <12 months	
Human Papillomavirus ¹¹	9 yrs	4 weeks	12 weeks		
Hepatitis A ⁹	12 mos	6 months			
Hepatitis B ¹	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	4 weeks ⁶	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	4 weeks if first dose administered at age ≥13 years 3 months if first dose administered at age <13 years			

1. Hepatitis B vaccine (HepB). (Minimum age: birth)

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB[®] is licensed for children aged 11–15 years.

2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)

- Do not start the series later than age 12 weeks.
- Administer the final dose in the series by age 32 weeks. Do not administer a dose later than age 32 weeks.
- Data on safety and efficacy outside of these age ranges are insufficient.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). (Minimum age: 6 weeks)

- The fifth dose is not necessary if the fourth dose was administered at age ≥4 years.
- DTaP is not indicated for persons aged ≥7 years.

4. *Haemophilus influenzae* type b conjugate vaccine (Hib). (Minimum age: 6 weeks)

- Vaccine is not generally recommended for children aged ≥5 years.
- If current age <12 months and the first 2 doses were PRP-OMP (PedvaxHIB[®] or ComVax[®] [Merck]), the third (and final) dose should be administered at age 12–15 months and at least 8 weeks after the second dose.
- If first dose was administered at age 7–11 months, administer 2 doses separated by 4 weeks plus a booster at age 12–15 months.

5. Pneumococcal conjugate vaccine (PCV). (Minimum age: 6 weeks)

- Vaccine is not generally recommended for children aged ≥5 years.

6. Inactivated poliovirus vaccine (IPV). (Minimum age: 6 weeks)

- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age ≥4 years.
- If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.

7. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
- If not previously vaccinated, administer 2 doses of MMR during any visit with ≥4 weeks between the doses.

8. Varicella vaccine. (Minimum age: 12 months)

- The second dose of varicella vaccine is recommended routinely at age 4–6 years but may be administered earlier if desired.
- Do not repeat the second dose in persons aged <13 years if administered ≥28 days after the first dose.

9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- HepA is recommended for certain groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.

10. Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap). (Minimum ages: 7 years for Td, 10 years for BOOSTRIX[®], and 11 years for ADACEL[™])

- Tdap should be substituted for a single dose of Td in the primary catch-up series or as a booster if age appropriate; use Td for other doses.
- A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose. A booster (fourth) dose is needed if any of the previous doses were administered at age <12 months. Refer to ACIP recommendations for further information. See *MMWR* 2006;55(No. RR-3).

11. Human papillomavirus vaccine (HPV). (Minimum age: 9 years)

- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

Information about reporting reactions after immunization is available online at <http://www.vaers.hhs.gov> or by telephone via the 24-hour national toll-free information line 800-822-7967. Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for immunization, is available from the National Center for Immunization and Respiratory Diseases at <http://www.cdc.gov/nip/default.htm> or telephone, 800-CDC-INFO (800-232-4636).

Appendix C Analysis of Performance Measures by Race/Ethnicity

The following tables include results of multivariate analysis of data for Medicaid members by race/ethnicity for selected immunization measures. This analysis was conducted to identify disparities in immunization rates among racial/ethnic minorities relative to non-Hispanic White members.

Highlighted rows indicate disparities between the racial/ethnic subgroup and non-Hispanic whites included in the measurements, as indicated by the range between the values in the “lower limit” and “upper limit” columns. “RR” equals relative risk: if the value in this column is ≥ 1.0 , members in this group are more likely than non-Hispanic white members to have the particular service being measured (these rows are highlighted in blue).

Note: For purposes of this analysis, the “Other” category includes Asian/Pacific Islanders and Cuban/Haitians, as these groups generally did not have large enough population sizes to be analyzed separately, as well as members for whom race was unknown or unspecified.

4:3:1:3:3 Combo

	n	Total	%		n	Total	%	RR	Std. Err	Lower Limit	Upper Limit
Hispanic	1076	1400	76.86%		2968	3455	85.9%	1.0633	0.0318	1.0301	1.0976
Black	1076	1400	76.86%		152	198	76.8%	0.9993	0.0818	0.9208	1.0846
Native American	1076	1400	76.86%		177	229	77.3%	1.0032	0.0759	0.9299	1.0823
Other	1076	1400	76.86%		204	237	86.1%	1.0645	0.0587	1.0038	1.1288

DTaP

	n	Total	%		n	Total	%	RR	Std. Err	Lower Limit	Upper Limit
Hispanic	1207	1400	86.21%		3237	3455	93.7%	1.0448	0.0227	1.0214	1.0687
Black	1207	1400	86.21%		174	198	87.9%	1.0103	0.0558	0.9554	1.0683
Native American	1207	1400	86.21%		202	229	88.2%	1.0123	0.0518	0.9612	1.0661
Other	1207	1400	86.21%		222	237	93.7%	1.0447	0.0392	1.0045	1.0864

PCV

	n	Total	%		n	Total	%	RR	Std. Err	Lower Limit	Upper Limit
Hispanic	1087	1400	77.64%		3048	3455	88.2%	1.0724	0.0306	1.0400	1.1057
Black	1087	1400	77.64%		161	198	81.3%	1.0261	0.0724	0.9544	1.1032
Native American	1087	1400	77.64%		177	229	77.3%	0.9975	0.0756	0.9248	1.0758
Other	1087	1400	77.64%		207	237	87.3%	1.0667	0.0560	1.0086	1.1282