IMMUNIZATION COMPLETION RATES BY 24 MONTHS OF AGE

A Biennial Report to the Governor, President of the Senate, and Speaker of the House
for the Measurement Period Ending September 30, 2011

"Our first care is your health care."

AHCCCS

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Director

Prepared by the Division of Health Care Management
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EXECUTIVE SUMMARY

This report is presented in accordance to state law *(ARS 36-2904),* which requires a biennial status of 24-month immunization completion rates for children served by the Arizona Health Care Cost Containment System (AHCCCS). The report looks at AHCCCS contracted health plan (Contractor) performance both individually and overall, while also analyzing Medicaid and KidsCare rates when appropriate.

Since the last report, there have been both social and technical factors that potentially affected the rates. These include:

- Revision of the dosage requirements for the Hib vaccine, increasing from two doses to three by age 2. Due to this change, some rates will not be comparable to historical performance.
- A national decrease in the number of children being fully immunized; from a high of 84 percent in 2004 to a low of 73 percent in 2009. A rate that low was last reported in the early 1990s.[1]
- Continued fear and misinformation over vaccination complications and risks (such as autism); recent data shows that 39 percent of parents refuse or choose to delay at least one routine vaccination for their children (compared to 22 percent five years prior).[2] In a 2011 poll, only 52 percent of Americans knew that vaccines did not cause autism; 18 percent still firmly believed that there is a link, and 30 percent were not sure.[3]

Overall performance rates for both individual and combination vaccines are included below. The sample consisted of 5,373 children whose second birthdays occurred on or between 10/1/2010 and 9/30/2011. Medicaid and KidsCare data have been combined for this summary.

2011 Immunization Rates at 24 Months of Age

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib** (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)	4:3:1:3:3:1 Combo	4:3:1:3:3:1:4 Combo
AHCCCS/ Healthy People 2020 Goals (%)	90	90	90	90	90	90	90	80	80
Current AHCCCS Rate	**79.5**	**91.4***	**91.3***	**91.5***	**87.9**	**90.5***	**79.9**	**72.9**	**69.1**
Previous AHCCCS Rate	84.8	93.4	94.9	n/a	94.0	94.0	83.2	n/a	n/a

* Indicates the current rates that meet or surpass the AHCCCS/Healthy People 2020 goal.
** Hib dosage requirements changed during the measurement period to three doses by age 2; the previous measure included two doses by age 2. Due to this change, the rates are not comparable.

AHCCCS and its Contractors continue to promote complete and timely immunizations for all populations served, with a specific focus on childhood immunizations. AHCCCS, AHCCCS Contractors, and relevant stakeholders work collaboratively to develop interventions and education initiatives between measurement periods, which includes monitoring of local, state and national trends that could potentially impact immunization rates.

IMMUNIZATION COMPLETION RATES AT 24 MONTHS OF AGE
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INTRODUCTION

Vaccine-preventable disease levels are at or near record lows.[4] The main cause for this can largely be attributed to routine immunization against such diseases. Vaccines are among the most cost-effective clinical preventive services and are a core component of preventive healthcare.[5] Research from Healthy People 2020[6] indicates that, for each birth cohort vaccinated with the routine schedule (DTap, Td, Hib, Polio, MMR, Hep B, and varicella), society:

- Saves 30,000 lives
- Prevents 14 million cases of disease
- Reduces direct health care costs by $9.9 billion
- Saves $33.4 billion in in-direct costs.

While many vaccine-preventable diseases are rarely seen in the United States, it is very important to promote strong immunization practices and encourage routine immunizations. Some of the diseases are still quite prevalent in other parts of the world, so the potential for an outbreak remains a possibility, as has been witnessed by recent pertussis, measles and mumps outbreaks in Arizona.[7]

In early 2008, an outbreak of measles, which was traced to a Swiss national visiting the United States, resulted in 13 confirmed and four probable cases of measles in Pima County, Arizona.[8] During the outbreak, the Arizona Department of Health tracked down and interviewed 8,321 people; seven Tucson hospitals had to furlough staff members for a combined 15,120 work-hours; and two hospitals where patients were admitted spent $799,136 to contain the disease.[9] More recently, the Centers for Disease Control (CDC) issued a Health Advisory[10] in 2011 that discussed an increase in measles cases in the U.S. Between January and June 2011, there were 156 cases, of which 133 (85 percent) were unvaccinated individuals.

In mid-2005, an outbreak of pertussis, commonly known as whooping cough, resulted in at least one infant death. In all, 959 cases — 3.5 times the number in the previous year — were reported in the state in 2005. There was an initial decrease in annual pertussis cases after 2005, only to begin climbing again. There were 277 confirmed cases of pertussis in Arizona during 2009, 546 cases in 2010, and 672 cases in 2011. Per the Arizona Department of Health Services (ADHS), the cornerstone of pertussis prevention is immunization.[11] Because pertussis coughs can linger for months and cause many complications such as pneumonia, seizures, brain damage and death, the ideal approach is protecting oneself from the disease through immunization.

The Arizona Health Care Cost Containment System (AHCCCS) and its contracted health plans (Contractors) continue to promote complete and timely immunizations for all populations served, with a specific focus on children. Contractors are required to report immunization rates on a biennial basis; AHCCCS and its Contractors collaborate to develop interventions and education initiatives between the measurement periods and also discuss local, state and national trends that could potentially impact immunization rates.

OVERVIEW

Background

Since 1993, AHCCCS has regularly measured the immunization status of children at 24 months of age. Arizona Revised Statute 36-2904 requires that AHCCCS submit a report to the Governor and Legislature that represents a statistically valid sample indicating the number of children who were AHCCCS members and received immunizations recommended by the CDC by age 2. The report, which is due every other year, must show immunization completion rates for each AHCCCS-contracted health plan.

This report includes 2011 measurement results of seven childhood immunizations, which protect against 11 different diseases: 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 individual vaccines as well as two combinations of the vaccines. Although not captured in this report, the CDC also recommends vaccinating against influenza, rotavirus, and hepatitis A. The recommended vaccination schedule can be found in Appendix B.

To prevent unnecessary illness, hospitalizations and deaths, high rates of vaccination are necessary – generally 90 percent or greater, according to the CDC. Monitoring of immunization completion rates is critical to identifying undervaccinated populations and increasing coverage levels in order to prevent outbreaks of disease.

AHCCCS has established goals and Minimum Performance Standards (MPS) for childhood immunization rates, which are used in evaluating Contractor performance. If Contractors do not meet the MPS for a particular vaccine or combination, they must implement corrective action plans and may be subject to sanctions if it fails to improve its rates. It should be noted that a Contractor may not meet the MPS for individual vaccines but may meet it for a particular combination, as these minimum standards are generally lower than those for single vaccines.

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 2020, 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 seven vaccines (DTap, IPV, MMR, Hib, HBV, VZV and PCV) by age 3.

Based on the Healthy People 2020 objectives, AHCCCS has adopted a goal of 90 percent for completion of individual childhood vaccines and 80 percent for two combined vaccine series.

AHCCCS Acute-care Performance Standards for Childhood Immunizations
For the Measurement Period of CYE 2011

Indicator	AHCCCS Minimum Performance Standard	AHCCCS Goal (based on Healthy People 2020 objectives)
4:3:1:2:3:1 Series	74%	80%
4:3:1:2:3:1:4 Series	68%	80%
DTaP - 4 doses	85%	90%
Polio - 3 doses	90%	90%
MMR - 1 dose	90%	90%
Hib - 3 doses	86%	90%
HBV - 3 doses	90%	90%
Varicella - 1 dose	86%	90%
PCV – 4 doses	74%	90%

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 the following immunizations: 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).

Overall rates are reported for the combined Medicaid and KidsCare populations to demonstrate the 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 (Tables 1 through 4). Results of the current measurement are compared with AHCCCS Minimum Performance Standards and Goals. Results also are reported for the complete series of all vaccines by county, in order to evaluate opportunities for improvement by geographic servicearea.

QUALITY INDICATORS

This immunization study is based on Healthcare Effectiveness Data and Information Set (HEDIS)-like 2011 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 United States. All quality indicators are based on identical denominator criteria. These indicators are listed below with the numerator criteria.

- DTaP 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

- 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
- 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
- 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
- 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
- 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
- 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
- HEDIS 2011 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
- HEDIS 2011 Combination #3 (4:3:1:3:3:1:4): 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, one VZV vaccination and four PCV vaccinations on or before their second birthdays

Utilizing HEDIS-like criteria, any vaccines administered after 24 months of age were not included in the numerators. Doses of DTaP, IPV and Hib 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 Pentacel®, which combines DTaP, IPV and Hib in one dose, or ComVax®, which combines Hib and HBV together — were counted as the appropriate individual vaccines.

STUDY METHODS

This measurement included children who turned 2 years old during the contract year ending (CYE) Sept. 30, 2011, 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 with a 95-percent confidence level and 5-percent confidence interval. The sample consisted of 5,373 children whose second birthdays occurred on or between Oct. 1, 2010, and Sept. 30, 2011, and who had at least 12 months of continuous enrollment with the same Contractor prior to, and including, their second birthdays. One gap in enrollment of up to one month was allowed.

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 electronic files containing the sample cases of Medicaid and KidsCare children. The ASIIS registry was searched by first name, last name and date of birth to match members in the AHCCCS sample against patients in the registry. If members in ASIIS were not exact matches by first name, last name and date of birth on the AHCCCS file, the registry was further searched to match against other factors, such as AHCCCS identification number or mother's social security number, if available. ADHS provided to AHCCCS all immunization data in the registry for those individuals it was able to conclusively match.

These data were merged with any vaccination data for administration of vaccines collected from the AHCCCS encounter system through the AHCCCS Data Decision Support (ADDS) data warehouse. AHCCCS then provided health plan-specific data collection files, with the vaccination data that it was able to collect, to each Contractor, along with specific instructions for collecting additional data. Contractor personnel also were instructed on the purpose of the study, data collection methods and internal quality control/validation procedures to ensure that data were collected and reported to AHCCCS in a consistent and reliable manner.

Contractor staff then collected additional data from medical records and/or any claims (encounters) not yet received or processed by AHCCCS. Data collected were entered into the Excel files, which were returned to AHCCCS for analysis. Data source documentation was retained by Contractors.

Data Analysis
Once data collection was finalized, AHCCCS merged the data from Contractors and performed analysis using COGNOS software in the ADDS system. 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-like 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.

Deviations from Previous Methodology
NCQA has made revisions to the HEDIS childhood immunization measures since the previous measurement conducted by AHCCCS. These changes include:

- Clarification that pneumococcal conjugate vaccinations administered prior to 42 days

after birth should not be counted as a numerator hit[12]

- Revision of the required number of doses for the Hib vaccine (three doses by age 2); the previous dosage (two by age 2) was in place during a Hib shortage that mainly took place in 2009

See Appendix C of this report for the complete study methodology.

RESULTS

The sample included 5,192 Medicaid-eligible children enrolled with 10 health plans and 181 KidsCare members enrolled with eight health plans. Four of the individual rates met or exceeded the AHCCCS and Healthy People 2020 goals. All cumulative rates showed a statistically significant decrease during this measurement period.

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib** (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)	4:3:1:3:3:1 Combo	4:3:1:3:3:1:4 Combo
AHCCCS/ Healthy People 2020 Goals (%)	90	90	90	90	90	90	90	80	80
Current AHCCCS Rate (%)	**79.5**	**91.4***	**91.3***	**91.5***	**87.9**	**90.5***	**79.9**	**72.9**	**69.1**
Previous AHCCCS Rate (%)	84.8	93.4	94.9	n/a	94.0	94.0	83.2	n/a	n/a
Statistical Significance of Change	*p<0.001*	*p<0.001*	*p<0.001*	n/a	*p<0.001*	*p<0.001*	*p=0.002*	n/a	n/a

* Indicates the current rates that meet or surpass the AHCCCS/Healthy People 2020 goal.

** Hib dosage requirements changed to three doses by age 2; the previous measure included two doses by age 2. Due to this change, the rates are not comparable.

Results by Contractor

For the purpose of evaluating Contractor performance, AHCCCS analyzed Medicaid and KidsCare populations separately. For the Medicaid population, there are 60 reported rates that allow for calculation of statistical significance when looking at individual immunizations by Contractor. While several decreases in those rates were documented, it is important to note that only eight individual antigen rates (13.3 percent) showed a statistically significant decrease. However, the non-significant decreases across the health plans did create statistically significant decreases overall for all immunization rates. Please refer to Appendix A for statistical significance calculation tables.

Three of the 10 Contractors had 4:3:1:3:3:1 combination completion rates that were above the AHCCCS Minimum Performance Standard (MPS) for this measure. The rates for those three Contractors also surpassed the AHCCCS and Healthy People 2020 Goal. Six of the Contractors' rates exceeded the MPS for the 4:3:1:3:3:1:4 combination, with one Contractor's rate surpassing the AHCCCS and Healthy People 2020 Goal.

For KidsCare members, seven of the eight Contractors had completion rates that exceeded the AHCCCS MPS for both vaccine combinations. Four of the eight Contractors had a completion

rate that met or exceeded the AHCCCS and Healthy People 2020 Goal. There was only one individual immunization rate for one Contractor that showed a statistically significant decrease; however, the non-statistically significant decreases in Contractors' HBV rates did cause a statistically significant decrease overall for that immunization.

Due to the change in the Hib dosage requirements, the individual Hib rate and the two combo rates are not comparable to the previous measure. Both individual and combination immunization completion rates are presented, by Contractor, in Tables 1 through 4.

Table 1:
Medicaid Rates for Individual Immunizations, by Health Plan
AHCCCS and Health People 2020 Goal = 90%

AHCCCS Contractor	Final Sample Size	Percent of Immunizations Completed by 24 Months of Age						
		DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib** (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)
Arizona Physicians IPA	726	78.9	91.3*	91.9*	92.2*	88.6	91.1*	79.6
	703	82.4	92.3	94.3	n/a	93.2	93.2	82.4
Bridgeway	155	74.2	86.5	88.4	84.5	69.0	87.1	73.6
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Care 1st Health Plan	156	88.5	96.8*	94.2*	96.8*	94.2*	92.9*	87.2
	73	93.2	97.3	98.6	n/a	98.6	98.6	91.8
DES/CMDP	269	85.1	95.5*	95.2*	94.4*	95.2*	95.2*	85.1
	303	84.8	94.1	96.4	n/a	96.0	95.4	80.5
DES/DDD	93	74.2	79.6	80.7	87.1	78.5	82.8	76.3
	74	78.4	83.8	82.4	n/a	78.4	86.5	73.0
Health Choice Arizona	1,216	77.5	88.8	89.7	89.4	84.5	88.7	75.3
	659	82.4	90.3	93.0	n/a	93.0	91.4	78.6
Maricopa Health Plan	246	86.6	94.7*	96.8*	94.3*	82.9	95.5*	86.9
	164	82.9	95.1	97.0	n/a	97.6	97.6	82.3
Mercy Care Plan	659	83.5	93.6*	92.6*	93.5*	93.6*	91.9*	85.4
	584	85.1	95.2	96.2	n/a	96.7	94.9	84.2
Phoenix Health Plan	1,118	77.2	90.9*	90.2*	90.8*	87.0	89.1	77.6
	473	79.7	91.8	93.0	n/a	90.3	91.3	80.1
University Family Care	554	75.3	91.9*	90.4*	91.2*	92.2*	90.3*	79.2
	63	84.1	96.8	96.8	n/a	98.4	93.7	82.5
TOTAL	**5,192**	**79.1**	**91.2***	**91.1***	**91.3***	**87.8**	**90.2***	**79.5**
PREVIOUS TOTAL	3,096	83.0	92.7	94.4	n/a	93.8	93.3	81.4

* Indicates the rate meets or exceeds the AHCCCS and Healthy People 2020 Goal

Table 2:
KidsCare Rates for Individual Immunizations, by Health Plan

AHCCCS and Health People 2020 Goal = 90%

AHCCCS Contractor	Final Sample Size	Percent of Immunizations Completed by 24 Months of Age						
		DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib** (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)
Arizona Physicians IPA	42	85.7	97.6*	95.2*	95.2*	85.7	97.6*	95.2*
	181	86.2	92.8	95.6	n/a	92.3	96.1	86.2
Bridgeway	1	100.0*	100.0*	0.0	100.0*	100.0*	100.0*	100.0*
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Care 1st Health Plan	12	100.0*	100.0*	100.0*	100.0*	100.0*	100.0*	100.0*
	37	91.9	100.0	100.0	n/a	100.0	100.0	94.6
Health Choice Arizona	32	87.5	93.8*	100.0*	96.9*	90.6*	100.0*	93.8*
	160	94.4	96.3	98.1	n/a.5	96.3	97.5	90.0
Maricopa Health Plan	11	81.8	100.0*	90.9*	100.0*	90.9*	90.9*	81.8
	45	100.0	100.0	100.0	n/a	100.0	100.0	93.3
Mercy Care Plan	49	95.9*	95.9*	100.0*	97.9*	95.9*	97.9*	95.9*
	206	94.7	97.1	96.6	n/a	97.6	97.1	94.7
Phoenix Health Plan	28	89.3	96.4*	92.9*	92.9*	82.1	85.7	82.1
	143	91.6	98.6	97.2	n/a	90.9	95.8	87.4
University Family Care	6	100.0*	100.0*	100.0*	100.0*	100.0*	100.0*	83.3
	1	0.0	0.0	0.0	n/a	0.0	0.0	0.0
TOTAL	**181**	**90.6***	**96.7***	**96.7***	**96.7***	**90.6***	**96.1***	**92.3***
PREVIOUS TOTAL	773	92.1	96.4	97.0	n/a	95.0	96.9	90.2

* Indicates the rate meets or exceeds the AHCCCS and Healthy People 2020 Goal

Table 3:
Medicaid Rates for 4:3:1:3:3:1 Combo and 4:3:1:3:3:1:4 Combo, by Health Plan

AHCCCS Contractor	Final Sample Size	Percent of Immunizations Completed by 24 Months of Age	
		DTaP, IPV, MMR, Hib, HBV, and VZV Rate (4:3:1:3:3:1 Combo)	DTaP, IPV, MMR, Hib, HBV, VZV, and PCV Rate (4:3:1:3:3:1:4 Combo)
		MPS = 74%	MPS = 68%
Arizona Physicians IPA	726	72.6	69.4*
Bridgeway	155	56.8	53.6
Care 1st Health Plan	156	82.7*	80.8*
DES/CMDP	269	82.5*	77.3*
DES/DDD	93	64.5	60.2
Health Choice Arizona	1,216	70.1	65.2
Maricopa Health Plan	246	72.8	69.1*
Mercy Care Plan	659	80.9	77.9*
Phoenix Health Plan	1,118	69.8	65.6
University Family Care	554	71.6	79.2*
TOTAL:	**5,192**	**72.6**	**68.6***

* Indicates the rate meets or exceeds the AHCCCS Minimum Performance Standard

Table 4:
KidsCare Rates for 4:3:1:3:3:1 Combo and 4:3:1:3:3:1:4 Combo, by Health Plan

AHCCCS Contractor	Final Sample Size	Percent of Immunizations Completed by 24 Months of Age	
		DTaP, IPV, MMR, Hib, HBV, and VZV Rate (4:3:1:3:3:1 Combo)	DTaP, IPV, MMR, Hib, HBV, VZV, and PCV Rate (4:3:1:3:3:1:4 Combo)
		MPS = 74%	MPS = 68%
Arizona Physicians IPA	42	76.2*	76.2*
Bridgeway	1	0	0
Care 1st Health Plan	12	100.0*	100.0*
Health Choice Arizona	32	87.5*	87.5*
Maricopa Health Plan	11	81.8*	72.7*
Mercy Care Plan	49	91.8*	89.8*
Phoenix Health Plan	28	75.0*	71.4*
University Family Care	6	100.0*	83.3*
TOTAL:	**181**	**84.5***	**92.3***

* Indicates the rate meets or exceeds the AHCCCS Minimum Performance Standard

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. County rates varied widely, with Apache County reporting the lowest combined completion rate and Graham and Yuma Counties showing the highest combined completion rate. Due to the change in the Hib dosage, results are not comparable to the previous measurement period. Immunization combination completion rates by County are presented in Tables 3.

Table 3

County	Final Sample Size	Percent of Immunizations Completed by 24 Months of Age	
		DTaP, IPV, MMR, Hib, HBV, and VZV Rate (4:3:1:3:3:1 Combo)	DTaP, IPV, MMR, Hib, HBV, VZV, and PCV Rate (4:3:1:3:3:1:4 Combo)
		MPS = 74%	**MPS = 68%**
Apache	49	51.0	46.9
Cochise	234	79.1*	77.4*
Coconino	221	68.3	62.4
Gila	102	63.7	59.8
Graham	118	79.7*	78.8*
Greenlee	23	69.6	60.9
La Paz	43	65.1	53.5
Maricopa	1,882	73.9*	70.6*
Mohave	309	64.1	61.2
Navajo	184	63.6	51.1
Pima	1,096	77.3*	73.9*
Pinal	323	68.1	64.4
Santa Cruz	162	79.6*	70.4*
Yavapai	303	65.7	61.1
Yuma	324	79.9*	76.9*
TOTAL:	**5,373**	**72.9**	**64.6**

* Indicates the rate meets or exceeds the AHCCCS Minimum Performance Standard

DISCUSSION AND CONCLUSIONS

The 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 years. Immunization rates are included as specific Performance Measures and are detailed in each Contractor's contract with AHCCCS. Results are subject to Corrective Action Plans (CAPs) and sanctions, if Contractor performance meets certain criteria as specified by AHCCCS.

AHCCCS provides data from this measurement to Contractors for further analysis and identification of barriers and interventions to improve performance. AHCCCS will continue to work with Contractors, especially those with the lowest rates of childhood immunizations, to assist them in making progress toward state and national goals. Sustained success and continual improvement will be the major focus over the next two years.

AHCCCS will be revising the current methodology in order to better capture immunization refusals versus untimely immunizations. It appears that many misperceptions exist regarding immunizations and the potential "harm" they can inflict on children. While there is not scientific evidence to support such claims, there are an increasingly large number of parents actively choosing to delay immunizations or to not vaccinate their children at all.[13] This makes it harder to sustain immunization rates and creates an even bigger challenge for rate improvement. AHCCCS will continue to research this trend and compare Arizona's results to national trends.

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.[14] Most AHCCCS Contractors have implemented several of these strategies, and their continued use should help sustain or further improve performance.

- **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, Contractors may consider offering incentives to parents of children who complete all immunizations by 24 months.

- **In addition to ongoing monitoring of completion of all childhood vaccinations, Contractors should focus on rates of DTaP and PCV completion, particularly those children who have received only three doses.** Given the effect that missing the fourth dose has on completion rates for the full series of immunizations, health plans and providers should focus on ensuring that children receive all the necessary doses of these vaccines.

- **Since all childhood vaccines can be completed at about 15 months of age, 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 years. Contractors should utilize the CDC's "catch up" immunization schedule, which is included in Appendix B, to help plan for completion of vaccinations. When children are overdue, Contractors should consider the additional step of assisting parents/guardians with making appointments with their Primary Care Physicians (PCPs) and make arrangements for transportation assistance if needed.

- **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,

leading to autism or other diseases and complications. 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 its 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 (www.cdc.gov) or from the Immunization Action Coalition (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.

One approach to overcoming unwarranted parental refusal that is seeing some success nationally is to educate providers that a parent's refusal at one visit does not necessarily mean that unnecessary fears and objections cannot be overcome in the future. Providers should continue to try educating parents that have previously refused vaccines, focusing on those that are the subject of the least amount of misinformation. Parents may agree to a few vaccines at first and their fears may be eased over time.

- **Contractors should target outreach activities in specific geographic areas, as needed.** Education in vaccine management and delivery for providers serving some areas of the state may be helpful.

- **Contractors should continue to ensure that health care professionals providing immunizations report all vaccinations to ASIIS.** With complete reporting, an automated registry is a valuable tool in helping providers determine the immunization status of children they are seeing at each 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.

- **Contractors should encourage providers to implement an Electronic Health Record (ERH) system.** Not only is there value in automating health records for the providers, but would also aid the Contractors in gathering complete data without relying on paper records or disrupting physician office routines. In addition, eligible providers may be eligible to receive incentive payments from CMS if they meet the necessary requirements, one of which being to electronically share immunization information utilizing a certified EHR to the state immunization system, ASIIS.

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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APPENDIX A:
STATISTICAL SIGNIFICANCE CALCULATION TABLES

Table 5: Statistical Significance Calculations for Individual Immunizations by Health Plan
Medicaid Members

AHCCCS Contractor	Final Sample Size	PERCENT OF IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE						
		Dtap (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)
Arizona Physicians IPA	726	78.9	91.3	91.9	92.2	88.6	91.1	76.6
	703	82.4	92.3	94.3	n/a	93.2	93.2	82.4
Statistical Significance (p value)		*p=.100*	*p=.492*	*p=.070*	*n/a*	***p=.003***	*p=.137*	*p=.186*
Bridgeway	155	74.2	86.5	88.4	84.5	69.0	87.1	73.6
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Statistical Significance (p value)		*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Care1st Health Plan	156	88.5	96.8	94.2	96.8	94.2	92.9	87.2
	73	93.2	97.3	98.6	n/a	98.6	98.6	91.8
Statistical Significance (p value)		*p=.271*	*p=1.00*	*p=.175*	*n/a*	*p=.175*	*p=.109*	*p=.306*
DES/CMDP	269	85.1	95.5	95.2	94.4	95.2	95.2	85.1
	303	84.8	94.1	96.4	n/a	96	95.4	80.5
Statistical Significance (p value)		*p=.917*	*p=.428*	*p=.474*	*n/a*	*p=.611*	*p=.905*	*p=.146*
DES/DDD	93	74.2	79.6	80.7	87.1	78.5	82.8	76.3
	74	78.4	83.8	82.4	n/a	78.4	86.5	73
Statistical Significance (p value)		*p=.529*	*p=.487*	*p=.768*	*n/a*	*p=.989*	*p=.513*	*p=.618*
Health Choice Arizona	1,216	77.5	88.8	89.7	89.4	84.5	88.7	75.3
	659	82.4	90.3	93	n/a	93	91.4	78.6
Statistical Significance (p value)		***p=.012***	*p=.324*	***p=.018***	*n/a*	***p<.001***	*p=.068*	*p=.110*
Maricopa Health Plan	246	86.6	94.7	96.8	94.3	82.9	95.5	86.9
	164	82.9	95.1	97	n/a	97.6	97.6	82.3
Statistical Significance (p value)		*p=.308*	*p=.855*	*p=.908*	*n/a*	***p<.001***	*p=.422*	*p=.193*
Mercy Care Plan	659	83.5	93.6	92.6	93.5	93.6	91.9	85.4
	584	85.1	95.2	96.2	n/a	96.7	94.9	84.2
Statistical Significance (p value)		*p=.428*	*p=.228*	***p=.005***	*n/a*	***p=.011***	***p=.041***	*p=.560*
Phoenix Health Plan	1,118	77.2	90.9	90.2	90.8	87.0	89.1	77.6
	473	79.7	91.8	93	n/a	90.3	91.3	80.1
Statistical Significance (p value)		*p=.269*	*p=.612*	*p=.068*	*n/a*	*p=.069*	*p=.177*	*p=.270*
University Family Care	554	75.3	91.9	90.4	91.2	92.2	90.3	79.2
	63	84.1	96.8	96.8	n/a	98.4	93.7	82.5
Statistical Significance (p value)		*p=.118*	*p=.212*	*p=.104*	*n/a*	*p=.073*	*p=.497*	*p=.538*
TOTAL	5,192	79.1	91.2	91.0	91.3	87.8	90.3	79.5
PREVIOUS TOTAL	3,096	83	92.7	94.4	n/a	93.8	93.3	81.4
Statistical Significance (p value)		***p<.001***	***p=.015***	***p<.001***	*n/a*	***p<.001***	***p<.001***	***p=.033***

Bolded p values indicate a statistically significant change from the previous measurement.

Table 6: Statistical Significance Calculations for Individual Immunizations by Health Plan
KidsCare Members

AHCCCS Contractor	Final Sample Size	PERCENT OF IMMUNIZATIONS COMPLETED BY 24 MONTHS OF AGE						
		Dtap (4 doses)	IPV (3 doses)	MMR (1 dose)	Hib (3 doses)	HBV (3 doses)	VZV (1 dose)	PCV (4 doses)
Arizona Physicians IPA	42	85.7	97.6	95.2	95.2	85.7	97.6	95.2
	181	86.2	92.8	95.6	n/a	92.3	96.1	86.2
Statistical Significance (p value)		*p=.936*	*p=.477*	*p=1.000*	*n/a*	*p=.923*	*p=.641*	*p=.122*
Bridgeway	1	100	100	0	100	100	100	100
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Statistical Significance (p value)		*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Care1st Health Plan	12	100	100	100	100	100	100	100
	37	91.9	100	100	n/a	100	100	94.6
Statistical Significance (p value)		*p=.566*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*p=1.000*
Health Choice Arizona	32	87.5	93.8	100	96.9	90.6	100	93.8
	160	94.4	96.3	98.1	n/a.5	96.3	97.5	90
Statistical Significance (p value)		*p=.237*	*p=.622*	*p=1.000*	*n/a*	*p=.174*	*p=1.000*	*p=.743*
Maricopa Health Plan	11	81.8	100	90.9	100	90.9	90.9	81.8
	45	100	100	100	n/a	100	100	93.3
Statistical Significance (p value)		***p=.036***	*n/a*	*p=.196*	*n/a*	*p=.196*	*p=.196*	*p=.251*
Mercy Care Plan	49	95.9	95.9	100	97.9	95.9	97.9	95.9
	206	94.7	97.1	96.6	n/a	97.6	97.1	94.7
Statistical Significance (p value)		*p=1.000*	*p=.652*	*p=.352*	*n/a*	*p=.623*	*p=1.000*	*p=1.000*
Phoenix Health Plan	28	89.3	96.4	92.9	92.9	82.1	85.7	82.1
	143	91.6	98.6	97.2	n/a	90.9	95.8	87.4
Statistical Significance (p value)		*p=.715*	*p=.056*	*p=.255*	*n/a*	*p=.181*	*p=.060*	*p=.543*
University Family Care	6	100.0	100.0	100.0	100.0	100.0	100.0	83.3
	1	0	0	0	n/a	0	0	0
Statistical Significance (p value)		*p=.143*	*p=.143*	*p=.143*	*n/a*	*p=.143*	*p=.143*	*p=.286*
TOTAL	181	90.6	96.7	96.7	96.7	90.6	96.1	92.3
PREVIOUS TOTAL	773	92.1	96.4	97	n/a	95	96.9	90.2
Statistical Significance (p value)		*p=.507*	*p=.841*	*p=.811*	*n/a*	***p=.025***	*p=.062*	*p=.385*

Bolded p values indicate a statistically significant change from the previous measurement.

APPENDIX B:
RECOMMENDED IMMUNIZATION SCHEDULE FOR INDIVIDUALS AGED 0-6
INCLUDING THE CATCH-UP SCHEDULE; U.S. VERSION, 2011

Recommended Immunization Schedule for Persons Aged 0 Through 6 Years—United States • 2011

For those who fall behind or start late, see the catch-up schedule

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						
Rotavirus[2]			RV	RV	RV[2]						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	see footnote[3]	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	Hib[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPSV	
Inactivated Poliovirus[6]			IPV	IPV	IPV						IPV
Influenza[7]					Influenza (Yearly)						
Measles, Mumps, Rubella[8]						MMR	see footnote[8]				MMR
Varicella[9]						Varicella	see footnote[9]				Varicella
Hepatitis A[10]						HepA (2 doses)				HepA Series	
Meningococcal[11]										MCV4	

Range of recommended ages for all children

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 21, 2010. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory Committee on Immunization Practices statement for detailed recommendations: **http://www.cdc.gov/vaccines/pubs/acip-list.htm**. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) 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 B 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 mother's HBsAg status as soon as possible and, if HBsAg-positive, administer HBIG (no later than age 1 week).

   Doses following the birth dose:
   - The second dose should be administered at age 1 or 2 months. Monovalent HepB should be used for doses administered before age 6 weeks.
   - Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg 1 to 2 months after completion of at least 3 doses of the HepB series, at age 9 through 18 months (generally at the next well-child visit).
   - Administration of 4 doses of HepB to infants is permissible when a combination vaccine containing HepB is administered after the birth dose.
   - Infants who did not receive a birth dose should receive 3 doses of HepB on a schedule of 0, 1, and 6 months.
   - The final (3rd or 4th) dose in the HepB series should be administered no earlier than age 24 weeks.
2. **Rotavirus vaccine (RV).** (Minimum age: 6 weeks)
   - Administer the first dose at age 6 through 14 weeks (maximum age: 14 weeks 6 days). Vaccination should not be initiated for infants aged 15 weeks 0 days or older.
   - The maximum age for the final dose in the series is 8 months 0 days
   - If Rotarix is administered at ages 2 and 4 months, a dose at 6 months is not indicated.
3. **Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).** (Minimum age: 6 weeks)
   - The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
4. ***Haemophilus influenzae* type b conjugate vaccine (Hib).** (Minimum age: 6 weeks)
   - If PRP-OMP (PedvaxHIB or Comvax [HepB-Hib]) is administered at ages 2 and 4 months, a dose at age 6 months is not indicated.
   - Hiberix should not be used for doses at ages 2, 4, or 6 months for the primary series but can be used as the final dose in children aged 12 months through 4 years.
5. **Pneumococcal vaccine.** (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])
   - PCV is recommended for all children aged younger than 5 years. Administer 1 dose of PCV to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
   - A PCV series begun with 7-valent PCV (PCV7) should be completed with 13-valent PCV (PCV13).
   - A single supplemental dose of PCV13 is recommended for all children aged 14 through 59 months who have received an age-appropriate series of PCV7.
   - A single supplemental dose of PCV13 is recommended for all children aged 60 through 71 months with underlying medical conditions who have received an age-appropriate series of PCV7.
   - The supplemental dose of PCV13 should be administered at least 8 weeks after the previous dose of PCV7. See *MMWR* 2010;59(No. RR-11).
   - Administer PPSV at least 8 weeks after last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant.
6. **Inactivated poliovirus vaccine (IPV).** (Minimum age: 6 weeks)
   - If 4 or more doses are administered prior to age 4 years an additional dose should be administered at age 4 through 6 years.
   - The final dose in the series should be administered on or after the fourth birthday and at least 6 months following the previous dose.
7. **Influenza vaccine (seasonal).** (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 2 years for live, attenuated influenza vaccine [LAIV])
   - For healthy children aged 2 years and older (i.e., those who do not have underlying medical conditions that predispose them to influenza complications), either LAIV or TIV may be used, except LAIV should not be given to children aged 2 through 4 years who have had wheezing in the past 12 months.
   - Administer 2 doses (separated by at least 4 weeks) to children aged 6 months through 8 years who are receiving seasonal influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season but only received 1 dose.
   - Children aged 6 months through 8 years who received no doses of monovalent 2009 H1N1 vaccine should receive 2 doses of 2010–2011 seasonal influenza vaccine. See *MMWR* 2010;59(No. RR-8):33–34.
8. **Measles, mumps, and rubella vaccine (MMR).** (Minimum age: 12 months)
   - The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
9. **Varicella vaccine.** (Minimum age: 12 months)
   - The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose.
   - For children aged 12 months through 12 years the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
10. **Hepatitis A vaccine (HepA).** (Minimum age: 12 months)
    - Administer 2 doses at least 6 months apart.
    - HepA is recommended for children aged older than 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A is desired.
11. **Meningococcal conjugate vaccine, quadrivalent (MCV4).** (Minimum age: 2 years)
    - Administer 2 doses of MCV4 at least 8 weeks apart to children aged 2 through 10 years with persistent complement component deficiency and anatomic or functional asplenia, and 1 dose every 5 years thereafter.
    - Persons with human immunodeficiency virus (HIV) infection who are vaccinated with MCV4 should receive 2 doses at least 8 weeks apart.
    - Administer 1 dose of MCV4 to children aged 2 through 10 years who travel to countries with highly endemic or epidemic disease and during outbreaks caused by a vaccine serogroup.
    - Administer MCV4 to children at continued risk for meningococcal disease who were previously vaccinated with MCV4 or meningococcal polysaccharide vaccine after 3 years if the first dose was administered at age 2 through 6 years.

The Recommended Immunization Schedules for Persons Aged 0 Through 18 Years are approved by the Advisory Committee on Immunization Practices (**http://www.cdc.gov/vaccines/recs/acip**), the American Academy of Pediatrics (**http://www.aap.org**), and the American Academy of Family Physicians (**http://www.aafp.org**).

Catch-up Immunization Schedule for Persons Aged 4 Months Through 18 Years Who Start Late or Who Are More Than 1 Month Behind—United States • 2011

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

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
PERSONS AGED 4 MONTHS THROUGH 6 YEARS					
Hepatitis B[1]	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Rotavirus[2]	6 wks	4 weeks	4 weeks[2]		
Diphtheria, Tetanus, Pertussis[3]	6 wks	4 weeks	4 weeks	6 months	6 months[3]
Haemophilus influenzae type b[4]	6 wks	4 weeks if first dose administered at younger than 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 or older	4 weeks[4] if current age is younger than 12 months 8 weeks (as final dose)[4] if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	
Pneumococcal[5]	6 wks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated Poliovirus[6]	6 wks	4 weeks	4 weeks	6 months[6]	
Measles, Mumps, Rubella[7]	12 mos	4 weeks			
Varicella[8]	12 mos	3 months			
Hepatitis A[9]	12 mos	6 months			
PERSONS AGED 7 THROUGH 18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis[10]	7 yrs[10]	4 weeks	4 weeks if first dose administered at younger than age 12 months 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human Papillomavirus[11]	9 yrs	Routine dosing intervals are recommended (females)[11]			
Hepatitis A[9]	12 mos	6 months			
Hepatitis B[1]	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated Poliovirus[6]	6 wks	4 weeks	4 weeks[6]	6 months[6]	
Measles, Mumps, Rubella[7]	12 mos	4 weeks			
Varicella[8]	12 mos	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

1. **Hepatitis B vaccine (HepB).**
   - Administer the 3-dose series to those not previously vaccinated.
   - The minimum age for the third dose of HepB is 24 weeks.
   - A 2-dose series (separated by at least 4 months) of adult formulation Recombivax HB is licensed for children aged 11 through 15 years.
2. **Rotavirus vaccine (RV).**
   - The maximum age for the first dose is 14 weeks 6 days. Vaccination should not be initiated for infants aged 15 weeks 0 days or older.
   - The maximum age for the final dose in the series is 8 months 0 days.
   - If Rotarix was administered for the first and second doses, a third dose is not indicated.
3. **Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).**
   - The fifth dose is not necessary if the fourth dose was administered at age 4 years or older.
4. ***Haemophilus influenzae* type b conjugate vaccine (Hib).**
   - 1 dose of Hib vaccine should be considered for unvaccinated persons aged 5 years or older who have sickle cell disease, leukemia, or HIV infection, or who have had a splenectomy.
   - If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax), and administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
   - If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months.
5. **Pneumococcal vaccine.**
   - Administer 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13) to all healthy children aged 24 through 59 months with any incomplete PCV schedule (PCV7 or PCV13).
   - For children aged 24 through 71 months with underlying medical conditions, administer 1 dose of PCV13 if 3 doses of PCV were received previously or administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
   - A single dose of PCV13 is recommended for certain children with underlying medical conditions through 18 years of age. See age-specific schedules for details.
   - Administer pneumococcal polysaccharide vaccine (PPSV) to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant, at least 8 weeks after the last dose of PCV. A single revaccination should be administered after 5 years to children with functional or anatomic asplenia or an immunocompromising condition. See *MMWR* 2010;59(No. RR-11).
6. **Inactivated poliovirus vaccine (IPV).**
   - The final dose in the series should be administered on or after the fourth birthday and at least 6 months following the previous dose.
   - A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months following the previous dose.
   - In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
7. **Measles, mumps, and rubella vaccine (MMR).**
   - Administer the second dose routinely at age 4 through 6 years. The minimum interval between the 2 doses of MMR is 4 weeks.
8. **Varicella vaccine.**
   - Administer the second dose routinely at age 4 through 6 years.
   - If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
9. **Hepatitis A vaccine (HepA).**
   - HepA is recommended for children aged older than age 23 months who live in areas where vaccination programs target older children, or who are at increased risk for infection, or for whom immunity against hepatitis A is desired.
10. **Tetanus and diphtheria toxoids (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).**
    - Doses of DTaP are counted as part of the Td/Tdap series.
    - Tdap should be substituted for a single dose of Td in the catch-up series for children aged 7 through 10 years or as a booster for children aged 11 through 18 years; use Td for other doses.
11. **Human papillomavirus vaccine (HPV).**
    - Administer the series to females at age 13 through 18 years if not previously vaccinated or have not completed the vaccine series.
    - Quadrivalent HPV vaccine (HPV4) may be administered in a 3-dose series to males aged 9 through 18 years to reduce their likelihood of genital warts.
    - Use recommended routine dosing intervals for series catch-up (i.e., the second and third doses should be administered at 1 to 2 and 6 months after the first dose). The minimum interval between the first and second doses is 4 weeks. The minimum interval between the second and third doses is 12 weeks, and the third dose should be administered at least 24 weeks after the first dose.

Information about reporting reactions after immunization is available online at **http://www.vaers.hhs.gov** or by telephone, **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/vaccines** or telephone, **800-CDC-INFO** (800-232-4636).
Department of Health and Human Services • Centers for Disease Control and Prevention

APPENDIX C:
METHODOLOGY

Purpose:
AHCCCS is required to report to the Governor and state Legislature immunization completion rates of members at 24 months of age on a biennial basis. The next report is due by April 1, 2012.

This study of members who turned 2 years of age in CYE 2011 will assess childhood immunization status overall and by AHCCCS-contracted health plan (Contractor) for the measurement period ending Sept. 30, 2011.

Study Question:
What is the number and percentage of children in the sample who met the numerator criteria for each indicator?

Population:
The population includes all Medicaid and KidsCare members enrolled with Acute-care Contractors and the Division of Developmental Disabilities (DDD) who turned 24 months of age during the measurement period.

Sample Frame:
The sample frame consists of children whose second birthdays occurred on or between Oct. 1, 2010, and Sept. 30, 2011, and who had at least 12 months of continuous enrollment with the same Contractor prior to and including their second birthdays. Children in the sample could have no more than a one-month gap in enrollment. Prior period coverage is considered a gap in enrollment.

Sample Selection:
AHCCCS identified a representative, random sample of children by Contractor, by county, for Medicaid and KidsCare members separately.

Population Exclusions:
Except for children enrolled in DDD, this study does not include members in the Arizona Long Term Care System (ALTCS), or those enrolled under the Fee for Service (FFS) Program, including Indian Health Services (IHS) and the Federal Emergency Services (FES) Program.

Members with the following conditions, as identified from encounter data or, as noted, in the medical record, are excluded from the population for this study:

Immunization	Description of Exclusion	ICD-9-CM Diagnosis
Any vaccine	Anaphylactic reaction to the vaccine or its components	999.4
DTaP	Encephalopathy	323.51 with (E948.4 or E948.5 or E948.6)
DTaP	Progressive neurologic disorder, including infantile spasm, uncontrolled epilepsy	As documented in the medical record
MMR and VZV	Immunodeficiency, including genetic (congenital) immunodeficiency syndromes	279
MMR and VZV	HIV disease; asymptomatic HIV	042, V08
MMR and VZV	Cancer of lymphoreticular or histiocytic tissue	200-202
MMR and VZV	Multiple myeloma	203
MMR and VZV	Leukemia	204-208
MMR and VZV	Anaplylactic reaction to neomycin	As documented in the medical record
Hepatitis B	Anaplylactic reaction to common baker's yeast	As documented in the medical record

The exclusionary condition must have occurred by the child's second birthday.

Indicators:
The percent overall and by individual Contractor of all children (Title XIX and Title XXI combined) who meet the sample frame and HEDIS-like numerator criteria.

Denominator:
Children who turned 24 months of age in the study period and were continuously enrolled with the same Contractor for 12 months prior to and including their second birthdays, with no more than a one-month gap in enrollment.

Numerators:
This study will utilize HEDIS-like criteria for measuring childhood immunizations, based on NCQA HEDIS 2001.

1. *DTaP Immunization*: The number of children in the denominator who received four DTaP (diphtheria, tetanus and acellular pertussis) vaccinations, with different dates of service, on or before their second birthdays. Any vaccination administered prior to 42 days after birth cannot be counted.
2. *IPV Immunization:* The number of children in the denominator who received at least three inactivated poliovirus (IPV) vaccinations with different dates of service on or before their second birthdays. IPV administered prior to 42 days after birth cannot be counted.
3. *MMR Immunization:* The number of children in the denominator who received at least one measles, mumps and rubella (MMR) vaccination on or before their second birthdays.
4. *Hib Immunization:* The number of children in the denominator who received at least three Haemophilus influenza type b (Hib) vaccinations with different dates of service on or before their second birthdays. Hib administered prior to 42 days after birth cannot be counted.
5. *HBV Immunization:* The number of children in the denominator who received at least three hepatitis B vaccinations with different dates of services on or before their second birthdays.
6. *VZV Immunization*: The number of children in the denominator who received at least one varicella vaccination (VZV) on or before their second birthdays.
7. *Pneumococcal Conjugate:* The number of children in the denominator who received at least four pneumococcal conjugate vaccinations (PCV) with different dates of service on or before their second birthdays.
8. *Hepatitis A Immunization:* The number of children in the denominator who received at least two hepatitis A vaccinations with different dates of services on or before their second birthdays.
9. *Rotavirus Immunization:* The number of children in the denominator, who received the required number of rotavirus vaccinations with different dates of service on or before their second birthdays (see medical record review specifications below).
10. *Influenza Immunization:* The number of children in the denominator who received at least two influenza conjugate vaccinations (PCV) with different dates of service on or before their second birthdays.
11. *Combination #2 (4:3:1:3:3:1):* The number of children in the denominator who received four DTaP vaccinations, three IPV vaccinations, one MMR vaccination, three Hib vaccinations, three HBV vaccinations and one VZV vaccination on or before their second birthdays.
12. *Combination #3 (4:3:1:3:3:1:4):* Children who received all antigens listed in Combination #2 and four doses of PCV on or before their second birthdays.

Data Sources:

A HEDIS-like hybrid methodology is being used to collect data from both administrative and medical record sources. Administrative data include claims/encounters and registry data received from the Arizona State Immunization Information System (ASIIS) maintained by the Arizona Department of Health Services (ADHS). Medical record data is collected by Contractors.

Data Collection:

AHCCCS will select the sample population and send it to ADHS for collection of data from ASIIS. ADHS will update the file with vaccination data from ASIIS and return it to AHCCCS. Data from the file will be imported into the MeasureBase program of ADDS and, following a HEDIS-like) specifications, based on HEDIS 2011, AHCCCS will collect additional service data for sample members.

AHCCCS will send to each Contractor a sample file containing data for members enrolled in the health plan. Contractor files will include vaccination data collected by AHCCCS from ASIIS, as well as data obtained from encounters for administration of vaccines submitted to AHCCCS by Contractors. Contractors will collect additional vaccination data for members in the sample file, according to a HEDIS-like hybrid specification. These data will be collected from medical records, encounter, administrative and/or provider claims for administration of vaccines.

Medical Record Review:

For immunization evidence obtained from the medical record, Contractors may count immunizations when there is evidence that the antigen was rendered from one of the following:

- A note indicating the name of the specific antigen and the date of the immunization ***or***
- A certificate of immunization prepared by an authorized health care provider or agency, including the specific dates and types of immunizations administered.

For MMR, hepatitis B and VZV, Contractors may supply any of the following:

- Evidence of the antigen or combination vaccine ***or***
- Documented history of the illness ***or***
- A seropositive test result

For DTaP, IPV, Hib and pneumococcal conjugate, count only:

- *Evidence of the antigen or combination vaccine.*

For Rotavirus, the following vaccine combinations are compliant:

- *Two doses of the two-dose vaccine (CPT 90681)* ***or***
- *One dose of the two-dose vaccine (CPT 90681) and two doses of the three-dose vaccine (CPT 90680)* ***or***
- *Three doses of the three-dose vaccine (CPT 90680).*

For documented history of illness or seropositive test results, the Contractor must find a note indicating the date of the event, which must have occurred by the child's second birthday.

Notes in the medical record indicating that the member received the immunization "at delivery" or "in the hospital" may be counted toward the numerator. This applies only to immunizations that do not have minimum age restrictions (i.e., prior to 42 days after birth). A note that the member "is up to date" with all immunizations but does not list the dates of all immunizations and the names of the specific immunization agents does not constitute evidence of immunization under the AHCCCS HEDIS-like specifications.

Immunizations documented using a generic header or DTaP/DTP/DT can be counted as evidence of DTaP. The burden on organizations to substantiate the DTaP antigen is excessive compared to a risk associated with data integrity.

For combination vaccinations that require more than one antigen (e.g., DTaP and MMR), the Contractor must find evidence of all the antigens.

Contractors will return the electronic files with their additional data to AHCCCS, as instructed. AHCCCS will check data for logical field-to-field comparisons (e.g., check for immunization dates that are prior to the member's birth). These data will then be imported into the MeasureBase to calculate each Contractor's rate of completed immunizations for the sample.

Dates of service for the same vaccine that are within 14 days of each other will be considered one immunization dose and will not be counted twice. When combining data sources (medical record, ASIIS and/or claims/encounter data), the medical record date should supersede other dates of service that are within 14 days (before or after) of the date in the medical record.

Final results will be used to evaluate Contractor performance for the childhood immunization measures specified in their contracts with AHCCCS.

Confidentiality Plan:
All parties involved in this study are required to adhere to all state and federal confidentiality laws and regulations.

Quality Assurance Process:

- Contractors will be instructed in data collection methods, sample file layout and timelines for data collection.
- Contractors will receive written instructions for data collection, in addition to AHCCCS resource and contact information for assistance.
- AHCCCS will verify that all records have been returned. The distribution to Contractors and return of sample files will be monitored by the AHCCCS Data Analysis and Research (DAR) Unit.

Analysis Plan:
Results will be analyzed according to HEDIS-like specifications. The primary analysis will provide results on the percentage of 2-year-old members that were immunized by 24 months for each quality indicator (DTaP, IPV, MMR, Hib, HBV, VZV, PCV and the combined series rates), overall, by Contractor and by county.

Results also will be compared to

- AHCCCS Minimum Performance Standards and Goals.
- Results for the previous measurement period
- National HEDIS (Medicaid and/or Commerical) averages reported by the National Committee for Quality Assurance (NCQA).
- Results by race/ethnicity will be compared to each other.

Definitions

- *Statistically Significant*: A finding is described as statistically significant when it can be demonstrated that the probability of obtaining such a difference by chance only is relatively low. It is customary to describe one's finding as statistically significant, when the obtained result is among those that (theoretically) would occur no more than 5 out of 100 times, $p <= .05$, or occur no more than 1 out of 100 times, $p <= .01$, when the only factors operating are the chance variations that occur whenever random samples are drawn. It is important to note that a finding may be statistically significant but may not be clinically or financially significant.

The statistically significant value is calculated using the Pearson chi-square test. Statistical Significance Level: $p <= .05$