Acute-care Contractor Performance Improvement Project:

IMMUNIZATION COMPLETION RATES BY 24 MONTHS OF AGE

Remeasurement, for the Period ending September 30, 2004

Arizona Health Care Cost Containment System
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Prepared by the Division of Health Care Management

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EXECUTIVE SUMMARY

Background

Since 1993, the Arizona Health Care Cost Containment System (AHCCCS) has periodically measured the immunization status of children at 24 months of age. In 2004, AHCCCS initiated a Performance Improvement Project (PIP) for all Acute-care Contractors, as well as the Arizona Department of Economic Security's Division of Developmental Disabilities (DES/DDD), to increase rates of immunization among members by 2 years of age.

AHCCCS-contracted health plans (Contractors) have been working to improve rates of immunization among children and adolescents for several years, and their efforts have shown steady increases. However, immunization coverage levels have not reached the 90-percent goal established for "Healthy People 2010." Unprecedented shortages of several childhood vaccines in 2001 and 2002 further limited the ability of health care providers and managed care organizations to achieve this goal. Thus, a PIP was launched to focus more intense efforts on improving childhood immunization rates among AHCCCS members.

This report includes measurement of immunization for 10 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), and varicella zoster virus (VZV). This measurement includes children who turned 2 years old during the contract year ending (CYE) September 30, 2004, and who were enrolled in AHCCCS under Medicaid (Title XIX of the Social Security Act) and KidsCare (Title XXI, the State Child Health Insurance Program). Completion rates for these vaccines are compared with baseline rates measured for children who turned 2 years old during CYE 2003.

Methodology

To conduct this assessment, AHCCCS identified a representative random sample of children who were born on or between October 1, 2001, and September 30, 2002, and who were continuously enrolled for 12 months prior to and including their second birthdays. The sample was stratified by AHCCCS Contractor and by county.

Data initially were obtained from the Arizona State Immunization Information System (ASIIS), an automated registry. When an incomplete record or no record was found in ASIIS for a particular child, the case was sent to the appropriate Contractor for further data collection. Health Services Advisory Group (HSAG), an external quality review organization, was utilized to coordinate data collection, and to aggregate and analyze results.

Overall Results

The final sample size consisted of 5,039 children enrolled in AHCCCS. This number included 4,302 Medicaid-eligible children enrolled with nine contracted health plans. The final sample also included 737 KidsCare members enrolled with seven acute-care Contractors. Completion rates for the combined Medicaid and KidsCare groups are as follows:

Summary of Immunization Completion Rates by 24 months of Age, for the Measurement Period Ending September 30, 2004

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	HIB* (2 doses)	HBV (3 doses)	VZV (1 dose)	4:3:1 Series	4:3:1:2:3 Series
Total	**82.8%**	**90.9%**	**93.0%**	**87.9%**	**86.3%**	**84.6%**	**80.0%**	**70.5**
Previous Total (Baseline)	76.7%	89.4%	91.5%	81.8%	81.6%	76.1%	73.8%	59.3%

Compared with the previous measurement period, total rates of completed immunizations for all individual vaccinations and both series showed statistically significant improvement. The greatest increase in rates was for the 4:3:1:2:3 series, which showed a relative improvement of 18.9 percent over the previous measurement. Relative percentage increases for other vaccines were as follows: VZV,11.2 percent; the 4:3:1 series, 8.4 percent; DTaP, 8 percent; Hib, 7.5 percent; HBV, 5.8 percent; IPV, 1.7 percent; and MMR, 1.6 percent.

Analysis and Conclusions

AHCCCS overall rates of completed immunizations among 2-year-old children increased significantly from the baseline measurement period. Rates of completion for all individual vaccines improved and, most importantly, the percentage of children who had completed doses for all vaccines increased.*

Declines in the previous period were primarily the result of a decrease in DTaP immunization, which is attributed to a shortage of that vaccine in 2001 and 2002. In mid-2002, the supply of DTaP returned to normal, and the vaccine was available during most of the time children in the current measurement period were being vaccinated.

In the remeasurement for this PIP, most AHCCCS Contractors maintained or improved immunization rates. Several Contractors achieved rates for individual vaccines of 90 percent or greater, meeting Healthy People 2010 goals. However, more work remains in order to make progress toward ensuring that children are fully immunized with all recommended vaccine doses.

* For purposes of this PIP, AHCCCS measured only two doses of Hib in order to make comparisons with baseline data. Completion of all vaccines is based on the 4:3:1:2:3 series of immunizations. AHCCCS also measured completion of three doses of Hib, which is the current standard for measurement of childhood immunizations, but those results are not reported here.

Through this Performance Improvement Project, all Contractors are expected to increase rates for the completed five-antigen immunization series (4:3:1:2:3) among children at 24 months. Contractors should strive to meet the Healthy People 2010 goal of 90 percent. A Contractor will have demonstrated improvement when:

- it meets or exceeds the AHCCCS overall average for the baseline measurement if its baseline rate was below the average, and the increase is statistically significant,
- it shows a statistically significant increase if its baseline rate was at or above the AHCCCS overall average for the baseline measurement, or
- it is the highest performing (benchmark) plan in any remeasurement year, and maintains or improves its rate in successive measurements until the PIP is completed.

A second remeasurement will be conducted in late 2005. Contractors that have demonstrated improvement between the baseline measurement and first remeasurement will be expected to maintain that level of performance. Contractors that did not show improvement in the first remeasurement must show a statistically significant increase in the second remeasurement, and will be required to continue this PIP until they maintain the improvement.

AHCCCS has provided detailed baseline and remeasurement data to Contractors for analysis and identification of additional barriers and interventions to improve rates of childhood immunizations. The AHCCCS Clinical Quality Management Unit continues to provide Contractors with "best practices" and other information designed to help them implement new interventions or enhance existing activities.

AHCCCS Contractors must continue aggressive outreach efforts to encourage parents to complete immunizations for their children. Contractors also should ensure that health care professionals providing immunizations to their members report all vaccinations to the Arizona State Immunization Information System (ASIIS). This automated registry could 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 fact, AHCCCS and its Contractors are initiating a new PIP in 2005 to increase provider reporting to ASIIS.

AHCCCS will work with Contractors, especially those with the lowest rates, to assist them in making progress toward these goals for improvement.

Arizona Health Care Cost Containment System (AHCCCS)

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Remeasurement, for the Period Ending September 30, 2004

I. INTRODUCTION

Background

Routine immunization of children and adults was one of the major achievements of medicine in the 20th century, offering a safe and cost-effective method of preventing serious, often life-threatening diseases.[1-3]

While successful immunization programs have virtually eliminated measles in the United States, dozens of cases have originated from foreign sources over the past few years, resulting in limited transmission here. Measles is a highly infectious, acute viral illness that can cause severe pneumonia, diarrhea, encephalitis and even death. Thus, maintaining immunity through high vaccination coverage levels (generally 90 percent or more) is essential to limit the spread of measles from imported cases and prevent it from becoming endemic again in the U.S. [4]

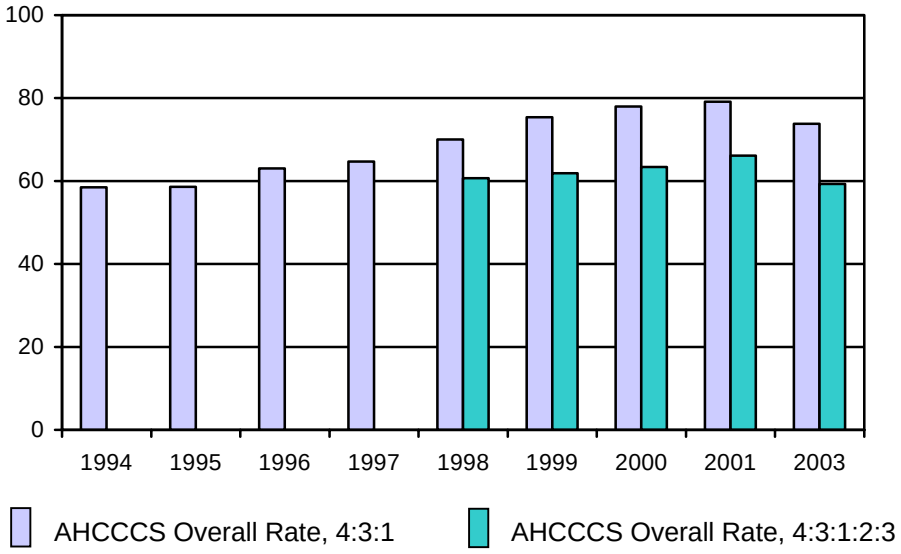
In Arizona, an outbreak of pertussis, commonly known as whopping cough, has resulted in more than 300 cases of the disease in the first five months of 2005 alone. The number of cases is more than twice the total number for 2004, and one infant death has been atrributed to the disease. [5]

Unnecessary fears and misconceptions about the safety and usefulness of childhood vaccines have prevented some children from being fully immunized. [6] All vaccines carry a risk of adverse effects on those who receive them, but this risk is minimal compared with the serious health risks and possibility of death posed by different diseases. 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.[7]

The Arizona Health Care Cost Containment System (AHCCCS) requires that children and adolescents be vaccinated according to the most current Recommended Childhood Immunization Schedule, published by the federal Centers for Disease Control and Prevention (CDC). The CDC recommends that all children be immunized for 12 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, hepatitis B, Haemophilus influenza type b, measles, mumps, rubella, varicella (known as chicken pox), Pneumococcal disease and influenza.

Monitoring of immunization completion rates is critical to identifying under vaccinated populations and increasing coverage levels in order to prevent outbreaks of disease. Since 1993, AHCCCS has periodically measured the vaccination status of children at 24 months of age. As seen in Figure 1, AHCCCS immunization rates increased from 1994 through 2001.

Figure 1. AHCCCS Overall Completion of DTaP, IPV and MMR (4:3:1) Series and DTaP, IPV, MMR, Hib and HBV (4:3:1:2:3) Series, by Contract Year



Notes:
1) The 4:3:1:2:3 combination was first measured for the AHCCCS contract year ending (CYE) September 30, 1998.
2) Rates for CYE 1994 through CYE 1999 include only Medicaid-eligible children; rates for CYE 2000 through CYE 2003 include Medicaid- and KidsCare-eligible children.

Despite these increases, AHCCCS immunization coverage levels have not reached the 90-percent threshold recommended by the CDC. Moreover, unprecedented shortages of several childhood vaccines in 2001 and 2002 further limited the ability of health care providers and contracted health plans to achieve this goal. The declines in immunization rates in CYE 2003 were primarily the result of a decrease in DTaP immunization, which is attributed to a shortage of that vaccine.

Healthy People Goals

Based on the CDC's recommendations, the United States Department of Health and Human Services (DHHS) has established a goal of 90 percent for completion of childhood vaccines by the year 2010. AHCCCS also has adopted a long-range goal of 90 percent for completion of childhood immunizations.

II. PURPOSE OF THE MEASUREMENT

In 2004, AHCCCS initiated a Performance Improvement Project (PIP) that includes all contracted acute-care health plans (Contractors) and the Arizona Department of Economic Security's Division of Developmental Disabilities (DES/DDD), to increase rates of immunization among members by 2 years of age. The PIP focuses more intense efforts on childhood immunizations, to continue progress toward national and AHCCCS goals.

This report includes measurement of immunization for 10 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), and varicella zoster virus (VZV). The measurement includes children who turned 2 years old during the contract year ending (CYE) September 30, 2004, and who were enrolled in AHCCCS under Medicaid (Title XIX of the Social Security Act) and KidsCare (Title XXI, the State Child Health Insurance Program). Completion rates for these vaccines are compared with baseline rates measured for children who turned 2 years old during CYE 2003, in order to evaluate improvement overall and by Contractor.

III. QUALITY INDICATORS

This immunization study is based on Health Plan Employer Data and Information Set (HEDIS®) criteria for measuring childhood immunizations. All quality indicators are based on identical denominator criteria. Quality indicators are listed below with the numerator criteria.

1. DTaP/DT Immunization Rate

The number of children in the denominator who received four DTaP (diphtheria, tetanus and acellular pertussis) vaccinations or an initial DTaP vaccination followed by at least three DT or individual diphtheria and tetanus shots by their second birthdays

2. IPV Immunization Rate

The number of children in the denominator who received at least three inactivated poliovirus vaccinations by their second birthdays

3. MMR Immunization Rate

The number of children in the denominator who received at least one measles, mumps and rubella vaccination on or between their first and second birthdays

4. Hib Immunization Rate

The number of children in the denominator who received at least two* Haemophilus influenza type b vaccinations by their second birthdays, with at least one of them falling on or between the first and second birthdays

5. HBV Immunization Rate

The number of children in the denominator who received at least three hepatitis B virus vaccinations by their second birthdays, with at least one of them falling on or between six months of age and two years of age

6. VZV Immunization Rate

The number of children in the denominator who received at least one varicella vaccination on or between their first and second birthdays

* Current HEDIS specifications require three Hib vaccinations by a child's second birthday; AHCCCS measured two doses of Hib for comparison of Contractor rates between the baseline and subsequent measurements. AHCCCS also measured completion of three doses of Hib, but those results are not reported here.

7. 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 by their second birthdays (this combination is no longer measured under HEDIS)

8. HEDIS 2001 Combination #1 (4:3:1:2:3)

The number of children in the denominator who received four DTaP/DT vaccinations, three IPV vaccinations, one MMR vaccination, two Hib vaccinations and three HBV vaccinations by their second birthdays (this combination also is no longer measured under HEDIS)

In accordance with HEDIS criteria, any vaccines administered after 24 months of age were not included in the numerator. Single doses of combined vaccines; e.g., Tetra-immune (TETRA), which combines DTaP and Hib in a single immunization, and COMVAX, which combines Hib and HBV together, were counted as the appropriate primary vaccines.

IV. METHODOLOGY

AHCCCS retained Health Services Advisory Group (HSAG), an external quality review organization, to assist with both the baseline and remeasurement studies for this PIP.

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 initial sample consisted of 5,161 children whose second birthdays occurred on or between October 1, 2003, and September 30, 2004 (born on or between October 1, 2001, and September 30, 2002), and who had at least 12 months of continuous enrollment prior to, and including, their second birthdays. One gap in enrollment of up to 31 days was allowed.

Data Collection

Data first were obtained 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. 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 sent each Contractor its data file with instructions for collecting additional data.*

* Contractors were asked to collect additional data for any member who did not have four doses of DTaP, three doses of IPV, one dose of MMR, three doses of Hib, three doses of HBV, and one dose of VZV, as well as four doses of Pneumococcal conjugate vaccine (the latter was measured to establish a baseline unrelated to this PIP).

From the total sample, 4,554 cases were sent to Contractors. AHCCCS allowed Contractors to collect data from two sources: medical records and administrative (claims) information, in accordance with HEDIS methodology. Contractors entered data into the Excel spreadsheets and returned the files to HSAG for analysis.

Excluded Cases

Based on data returned by Contractors, some members were excluded from the study because their medical records indicated parental refusal or contraindication to vaccination, or because it was found that their second birthdays did not occur on or between October 1, 2003, and September 30, 2004. A total of 122 cases were excluded from the combined sample (114 Medicaid members and 8 KidsCare members). Final sample sizes by individual Contractor ranged from 104 to 1,854 children.

Data Analysis

Once data collection was finalized, HSAG managed the database and performed analysis using statistical software. The primary analysis provided results on the percentage of 2-year-old members that were age-appropriately immunized by 24 months for each HEDIS quality indicator, overall, by individual Contractor and by county. Additional analysis was conducted to identify missed opportunities for completion of DTaP vaccination.

Following HEDIS specifications, vaccine doses with dates of service within 14 days of each other (for the same vaccine) for a single child were considered the same immunization. This allowed for data from different sources to be combined, while reducing the possibility of counting the same immunization twice.

V. RESULTS

The final sample size consisted of 5,039 children enrolled in AHCCCS. This number included 4,302 Medicaid-eligible children enrolled with nine contracted health plans. The final sample also included 737 KidsCare members enrolled with seven acute-care Contractors. Completion rates were as follows:

Summary of Immunization Completion Rates by 24 months of Age, for the Measurement Period Ending September 30, 2004

	DTaP (4 doses)	IPV (3 doses)	MMR (1 dose)	HIB* (2 doses)	HBV (3 doses)	VZV (1 dose)	4:3:1 Series	4:3:1:2:3 Series
Total	**82.8%**	**90.9%**	**93.0%**	**87.9%**	**86.3%**	**84.6%**	**80.0%**	**70.5%**
Previous Total (Baseline)	76.7%	89.4%	91.5%	81.8%	81.6%	76.1%	73.8%	59.3%

* For purposes of this PIP, AHCCCS measured only two doses of Hib in order to make comparisons with baseline data. AHCCCS also measured completion of three doses of Hib, which is the current standard for measurement of childhood immunizations, but those results are not reported here.

Compared with the previous measurement period, total rates of completed immunizations for all individual vaccinations and both series showed statistically significant improvement. The greatest increase in rates was for the 4:3:1:2:3 series, which showed a relative improvement of 18.9 percent over the previous measurement. Relative percentage increases for other vaccines were as follows: VZV,11.2 percent; the 4:3:1 series, 8.4 percent; DTaP, 8 percent; Hib, 7.5 percent; HBV, 5.8 percent; IPV, 1.7 percent; and MMR, 1.6 percent. Individual vaccine and combined series rates for the remeasurement and baseline periods, by Contractor, are presented in Tables 1A and 1B.

It should be noted that the rate for an immunization series is not an average of the individual vaccination rates, but a measurement of the number of children who had all of the required doses of each vaccine in the series by 24 months of age.

VI. ANALYSIS

AHCCCS overall rates of completed immunizations among 2-year-old children increased significantly from the baseline measurement period. Rates of completion for all individual vaccines improved and, most importantly, the percentage of children who had completed doses for all vaccines increased.*

Declines in the previous period were primarily the result of a decrease in DTaP immunization, which is attributed to a shortage of that vaccine in 2001 and 2002. In mid-2002, the supply of DTaP returned to normal, and the vaccine was available during most of the time children in the current measurement period were being vaccinated.

In the remeasurement for this PIP, most AHCCCS Contractors maintained or improved immunization rates. Several Contractors achieved rates for individual vaccines of 90 percent or greater, meeting Healthy People 2010 goals.

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 would have increased to 95.2 percent if these members had received just one more dose, compared with the actual completion rate of 82.8 percent (Table 2).

VII. CONCLUSIONS AND RECOMMENDATIONS

More work remains in order to make progress toward ensuring that children are fully immunized with all recommended vaccine doses. AHCCCS has provided detailed baseline and remeasurement data to all Contractors for analysis and identification of additional barriers and interventions to improve rates of childhood immunizations.

* Based on the 4:3:1:2:3 series of immunizations

Through this Performance Improvement Project, all Contractors are expected to increase rates for the completed five-antigen immunization series (4:3:1:2:3) among children at 24 months. Contractors should strive to meet the Healthy People 2010 goal of 90 percent. A Contractor will have demonstrated improvement when:

- it meets or exceeds the AHCCCS overall average for the baseline measurement if its baseline rate was below the average and the increase is statistically significant,
- it shows a statistically significant increase if its baseline rate was at or above the AHCCCS overall average for the baseline measurement, or
- it is the highest performing (benchmark) plan in any remeasurement year, and maintains or improves its rate in successive measurements until the PIP is completed.

Contractor performance for the baseline and remeasurement periods, compared with the AHCCCS overall baseline average and the Healthy People 2010 goal is presented in Figure 2. A second remeasurement will be conducted in late 2005. Contractors that have demonstrated improvement between the baseline measurement and first remeasurement will be expected to maintain that level of performance. Contractors that did not show improvement in the first remeasurement must show a statistically significant increase in the second remeasurement, and will be required to continue this PIP until they maintain the improvement.

AHCCCS will work with Contractors, especially those with the lowest rates, to assist them in making progress toward these goals for improvement. The AHCCCS Clinical Quality Management Unit continues to provide Contractors with "best practices" and other information designed to help them implement new interventions or enhance existing activities. Specific recommendations to improve immunization-completion rates among 2-year-olds enrolled in AHCCCS include the following:

- AHCCCS Contractors must continue outreach efforts to encourage parents to complete immunizations for their children. Mail and telephone reminders to parents and providers have been found to be effective in improving immunization-completion rates.[8] In addition, some Contractors offer incentives, such as a $25 gift certificate, to parents of children who complete all immunizations by 24 months.

- Given the fact that four doses are needed to complete the DTaP vaccine, and the effect that missing only one dose has on completion rates for this immunization, health plans and providers should particularly focus on ensuring that children receive all the necessary doses of this vaccine. Since all childhood vaccines can be completed at about 15 months, some health plans begin checking to see if members turning that age have all their immunizations, including the fourth dose of DTaP. If members are lacking doses, parents are encouraged to take them for "catch-up" shots or completion of immunizations.

- Contractors should continue member education to overcome parental complacency or fears regarding vaccination. This includes clearly explaining the potential consequences of not having children fully immunized, including seizures, meningitis, hearing impairment and even death due to infectious diseases.

- Contractors should target outreach activities to certain groups or geographic areas. National data indicate that Native American, African American and Hispanic children are likely to have lower immunization coverage levels, compared with non-Hispanic white children.[9] Additionally, monitoring coverage in specific geographic areas, such as at the county level, may help Contractors target interventions to increase immunization. AHCCCS provided county-specific date to the health plans included in this project.

- Contractors should 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 conducting this assessment, AHCCCS found that 41.7 percent of sample members had all of the doses recommended for DTaP, IPV, MMR, Hib, HBV and VZV (4:3:1:3:3:1) immunization, according to ASIIS records. By individual Contractor, rates of completion using the ASIIS data ranged from 17.4 percent to 54.4 percent (Table 3).

- Contractors should conduct practice-based assessments of immunization rates and provide feedback to physicians and office staff. These assessments could be tied to incentives for practices that meet immunization-completion standards.

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] Centers for Disease Control and Prevention. *MMWR*. Epidemiology of measles, United States, 2001 – 2003. 2004; 53(31):713-716. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5331a3.htm. Accessed August 13, 2004.

[5] State of Arizona Executive Office. Governor Napolitano to Release Funds to Combat Whooping Cough Outbreak. Press release. May 20, 2005.

[6] Kennedy A, Brown C, Gust D. Vaccine beliefs of parents who oppose cumpulsory vaccination. *Public Health Rep*. 2005;120:252-258.

[7] National Committee for Quality Assurance. The State of Health Care Quality 2004, Childhood Immunization Status. Available at: http://www.ncqa.org/communications/SOMC/SOHC2004.pdf. Accessed April 19, 2005.

[8] Immunization Strategies for Health Care Practices and Providers. Atkinson W, Wolfe S, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases*, Seventh Edition, second printing. Atlanta, Ga. Centers for Disease Control and Prevention; 2003.

[9] Centers for Disease Control and Prevention. Estimated Vaccination Coverage with Individual Vaccines and Selected Vaccination Series among Children 19-35 Months of Age by Poverty Level and Race/Ethnicity – U.S. Available at: http://www2a.cdc.gov/nip/coverage/nis_iap. Accessed February 18, 2004.

Table 1A. Immunization Completion Rates by 24 Months of Age, by Contractor: Individual Vaccines, All Members (Medicaid and KidsCare) For the Contract Year Ending September 30, 2004

AHCCCS Contractor	Final Sample Size	PERCENT IMMUNIZATIONS COMPLETED					
		4 DTaP	3 IPV	1 MMR	2 Hib	3 HBV	1 VZV
Maricopa Health Plan	321	90.7 (p<.001)	96.0 (p=.229)	95.6 (p=.265)	92.5 (p<.001)	90.7 (p=.078)	92.8 (p=.004)
	468	78.2	94.0	93.8	84.2	86.5	86.3
Pima Health System	140	90.0 (p=.902)	93.6 (p=.152)	95.0 (p=.213)	98.6 (p=.014)	91.4 (p=.928)	91.4 (p=.668)
	192	89.6	96.9	97.9	92.7	91.1	92.7
Arizona Physicians IPA	1854	81.6 (p<.001)	90.1 (p<.001)	91.3 (p=.029)	84.7 (p<.001)	88.1 (p<.001)	81.7 (p<.001)
	2412	72.7	86.5	89.3	73.9	77.5	72.7
DES/CMDP	200	78.0 (p=.383)	92.0 (p=.146)	94.0 (p=.898)	84.5 (p=.058)	83.5 (p=.055)	85.0 (p=.059)
	158	74.1	87.3	93.7	76.6	75.3	77.2
Phoenix Health Plan	480	87.9 (p=.303)	95.0 (p=.394)	95.0 (p=.833)	93.1 (p=.311)	92.7 (p=.288)	87.9 (p=.001)
	663	85.8	93.8	94.7	94.6	90.9	80.2
Mercy Care Plan	1199	85.9 (p<.001)	92.5 (p=.043)	94.0 (p=.041)	90.2 (p=.001)	89.7 (p<.001)	84.3 (p<.001)
	2109	77.4	90.4	92.1	86.2	81.6	75.5
University Family Care	200	79.5 (p=.193)	90.5 (p=.870)	95.5 (p=.137)	90.5 (p=.527)	91.0 (p=.127)	87.0 (p=.090)
	265	74.3	90.9	92.1	88.7	86.4	81.1
Health Choice Arizona	541	74.7 (p=.083)	86.0 (p=.035)	92.4 (p=.895)	85.8 (p=.380)	66.7 (p<.001)	85.6 (p<.001)
	772	78.8	89.8	92.6	87.4	84.6	74.4
DES/DDD	104	67.3 (p=.523)	72.1 (p=.337)	89.4 (p=.052)	78.8 (p=.374)	66.3 (p=.553)	80.8 (p=.050)
	142	63.4	77.5	80.3	73.9	62.7	69.7
TOTAL	**5039**	**82.8 (p<.001)**	**90.9 (p=.007)**	**93.0 (p=.003)**	**87.9 (p<.001)**	**86.3 (p<.001)**	**84.6 (p<.001)**
PREVIOUS TOTAL	7181	76.7	89.4	91.5	81.8	81.6	76.1

NOTES:
Shaded rows include previous results (CYE 2003).
The statistically significant value is calculated using the Pearson chi-square test. Statistical significance level: P<= .05

Table 1B. Immunization Completion Rates by 24 Months of Age, by Contractor: Vaccine Series, All Members (Medicaid and KidsCare) For the Contract Year Ending September 30, 2004

AHCCCS Contractor	Final Sample Size	TRADITIONAL DTaP, IPV & MMR RATE (4:3:1)	DTaP, IPV, MMR, Hib & HBV (4:3:1:2:3)
Maricopa Health Plan	321	88.8 (p<.001)	78.8 (p<.001)
	468	74.6	63.3
Pima Health System	140	87.1 (p=.699)	80.7 (p=.909)
	192	88.5	80.2
Arizona Physicians IPA	1854	78.6 (p<.001)	70.3 (p<.001)
	2412	69.3	48.6
DES/CMDP	200	74.0 (p=.193)	61.5 (p=.002)
	158	67.7	44.9
Phoenix Health Plan	480	87.1 (p=.168)	82.5 (p=.078)
	663	84.2	78.3
Mercy Care Plan	1199	83.1 (p<.001)	75.2 (p<.001)
	2109	75.0	62.2
University Family Care	200	78.0 (p=.103)	70.0 (p=.047)
	265	71.3	61.1
Health Choice Arizona	541	71.2 (p=.037)	50.3 (p<.001)
	772	76.3	66.3
DES/DDD	104	59.6 (p=.942)	45.2 (p=.898)
	142	59.2	44.4
TOTAL	**5039**	**80.0 (p<.001)**	**70.5 (p<.001)**
PREVIOUS TOTAL	7181	73.8	59.3

NOTES:
Shaded rows include previous results (CYE 2003).
The statistically significant value is calculated using the Pearson chi-square test. Statistical significance level: P<= .05

Table 2. Potential Missed Opportunities in DTaP Completion Rates, by Contractor:
All Members (Medicaid and KidsCare)
For the Contract Year Ending September 30, 2004

AHCCCS Contractor	Final Sample Size	DTaP Complete (4 Doses)		3 DTaP Doses		Potential Completion Rate	
		#	%	#	%	#	%
Maricopa Health Plan	321	291	90.7	23	7.2	314	97.8
Pima Health System	140	126	90.0	12	8.6	138	98.6
Arizona Physicians IPA	1854	1513	81.6	234	12.6	1747	94.2
DES/CMDP	200	156	78.0	38	19.0	194	97.0
Phoenix Health Plan	480	422	87.9	42	8.8	464	96.7
Mercy Care Plan	1199	1030	85.9	122	10.2	1152	96.1
University Family Care	200	159	79.5	34	17.0	193	96.5
Health Choice Arizona	541	404	74.7	99	18.3	503	93.0
DES/DDD	104	70	67.3	22	21.2	92	88.5
TOTAL	**5039**	**4171**	**82.8**	**626**	**12.4**	**4797**	**95.2**

Table 3. Complete* Records in the Arizona State Immunization Information System (ASIIS), by Contractor: All Members, (Medicaid and KidsCare) For the Contract Year Ending September 30, 2004

AHCCCS Contractor	Final Sample Size	Complete Records Found in ASIIS	Percent of Complete Records Found in ASIIS
Maricopa Health Plan	321	56	17.4
	468	55	11.8
Pima Health System	140	62	44.3
	192	50	26.0
Arizona Physicians IPA	1854	821	44.3
	2412	603	25.0
DES/CMDP	200	54	27.0
	158	23	14.6
Phoenix Health Plan	480	261	54.4
	663	223	33.6
Mercy Care Plan	1199	526	43.9
	2109	696	33.0
University Family Care	200	90	45.0
	265	73	27.5
Health Choice Arizona	541	201	37.2
	772	248	32.1
DES/DDD	104	31	29.8
	142	20	14.1
TOTAL	**5039**	**2,102**	**41.7**
PREVIOUS TOTAL	7181	1,991	27.7

NOTES:
Shaded rows include previous results (CYE 2003).
*A record was considered complete for CYE 2004 if the child had at least four DTaP doses, three IPV doses, one MMR dose, three Hib doses, three HBV doses and one VZV dose (4:3:1:3:3:1 series) by 24 months of age. For the CYE 2003 measurement, a record was considered complete if the child had at least four DTaP doses, three IPV doses, one MMR dose, two Hib doses, three HBV doses and 1 VZV dose (4:3:1:2:3:1 series) by 24 months of age.

Figure 2. Immunization Completion Rates by 24 Months of Age, by Contractor: 4:3:1:2:3 Vaccine Series, Medicaid and KidsCare Members Combined Baseline (CYE 2003) and Remeasurement (CYE 2004) Results