

GEORGIA IMMUNIZATION STUDY

2008 Final Report



Georgia Department of Community Health | Division of Public Health
Epidemiology Section | Healthy Behavior Epidemiology Unit
Immunization Program
Eighteen Public Health Districts

Prepared by

Carol A. Hoban, MPH, PhD, & Rebecca M. Willis, MHS,
Co-Principal Investigators and Co-Project Coordinators

Contributors

LaTonya M. Thomas, MBA-HCM, Assessment Coordinator
Michelle Conner, BSN, MS, MBA, Georgia Immunization Program



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COMMUNITY HEALTH

Division of Public Health

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We would also like to thank the Rollins School of Public Health at Emory University for providing us with the study materials. Their generosity allowed us to continue repeated assessments each year and compare our efforts with theirs.

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2008 Executive Summary

The 2008 Immunization Study was conducted by the Georgia Department of Community Health, Division of Public Health, Epidemiology Section, Immunization Program and Public Health Districts. However, this study could not have been conducted without the assistance of the private providers, public health providers and the Vaccines for Children providers that contributed in this collaborative effort. Their cooperation and assistance throughout the study is greatly appreciated.

The Immunization Study employs a non-experimental retrospective cohort research design to ascertain the immunization coverage rate for children born in the State of Georgia. This study design allows for the calculation of immunization rates for children who turned two in January 2008. Identifying information about the children and their parents was obtained from birth certificates.

The Immunization Study found that during 2008 most childhood immunizations (80.6%) were administered in the private sector, while County Health Departments immunized 11.6%, and the sources for 7.8% are unknown. The proportion of children in Georgia who have received all of the recommended vaccinations showed a steady increase from 16% in 1997 to 79% in 2002, a slight decrease in 2003 to 74%, but an increase in 2004 to 81%. The 2005 study results showed another slight decrease in the immunization rate at 77% which remained stable during the 2006 study, increasing slightly to 78% in 2007 and slightly declined to 77.8% in 2008.

Acute infection with Hepatitis B causes severe disease in only a small proportion of those infected, but it can lead to chronic infection, cirrhosis, and cancer of the liver. In Georgia in 2008, 94.3% of infants had received two doses of hepatitis B vaccine by 12 months of age, and, at 24 months, 91.7% of children had received the recommended three doses.

Vaccines have largely controlled diphtheria, measles, pertussis, and other scourges of the past. In 1923, with a population of less than three million, Georgia recorded 274 deaths from diphtheria, 347 deaths from measles, and 254 deaths from pertussis, while in 2003, just 80 years later, and with a population that has almost tripled, Georgia had no reported cases of tetanus or diphtheria, and just 36 cases of pertussis. In 2008, 85.9% of children 12 months of age were appropriately immunized against diphtheria, tetanus and pertussis, and 77.8% of Georgia's two-year-olds were adequately immunized against ten vaccine-preventable childhood diseases (diphtheria, tetanus, pertussis, hepatitis B, *H. influenzae* type B, mumps, measles, rubella, polio and varicella).

There was considerable variation from district to district in the proportion of two-year-olds reported to be fully immunized, ranging from 69% in the Clayton County district to 93.1% in the East Metro (Gwinnett) district. Four of the state's public health districts (Dalton, Gainesville, Augusta, and Gwinnett) succeeded in immunizing at least 85% of their two-year-olds against the 10 vaccine-preventable childhood diseases. Only two of the state's public health districts (Fulton and Clayton) had a rate less than 75%. Within Metropolitan Atlanta, the immunization rates varied from 69% in Clayton to 93% in Gwinnett. In Georgia outside Metropolitan Atlanta, the immunization rates ranged from 75% in LaGrange to 91% in the Augusta district.

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SECTION I:

PROJECT OVERVIEW

SECTION I: PROJECT OVERVIEW AND INTRODUCTION

The Division of Public Health, Epidemiology Section, Immunization Program and Health Districts collaborated on the 2008 Georgia Immunization Study. The purpose of the study was to assess the immunization coverage rates of two-year-old children in Georgia statewide and for each of the eighteen health districts.

The Georgia Immunization Survey is now in its twelfth year. The Rollins School of Public Health, Emory University conducted the first three years of the study and the Georgia Division of Public Health has continued on with the survey for the remaining nine years. Immunization data for each year of the study evaluate rates for children born two years before the beginning of the study. In 2008, immunization rates for children born in January 2006 were examined. The current rates are compared throughout this report with data from the previous four years of the study.*

Public health representatives in each of the eighteen health districts collected immunization data from both public and private health care providers. The Co-Principal Investigators and Co-Project Coordinators were Carol A. Hoban, MPH, PhD, and Rebecca M. Willis, MHS, and the Assistant Project Coordinator was LaTonya Thomas, MBA-HCM.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in November 2007. During December 2007, the sampling procedure was completed, and revisions were made to the data collection form and training manual. Letters were sent to each district health director informing them about the study. Each Vaccines For Children provider in Georgia (approximately 700) received a letter and supporting information about the study during the month of January 2008.

* Throughout this report, we refer to study years one, two, three, four, and five as, 2004, 2005, 2006, 2007 and 2008 respectively. The results from these five study years refer to rates for 2001, 2002, 2003, 2004, and 2005 respectively.

During January, a training session for the public health representatives was held via conference call. Data were collected from February 2008 through September 2008. The Project Coordinator and Assistant Project Coordinator served as the contact persons for the public health representatives during the data collection period. Conference calls were held as needed with the public health representatives to answer questions and address concerns regarding data collection.

Table 1 describes project activities that took place throughout the project timeline.

Table 1:
Project Activity Timeline

Project Activity	Date
Stratified sample drawn	December, 2007
Initial notification of public health community Immunization Coordinators Health Directors	December, 2007
Initial notification of private health community	January, 2008
Conference call training for public health representatives	January, 2008
Data collection period	February – September, 2008
Data entry period	March, 2008 – September, 2009*
Double data entry of 5% of data forms	September, 2009
Final data cleaning and analysis of data	September, 2009
Final Report	October, 2009
* Due to departmental restructuring, data entry and analysis were delayed for a period of approximately 12 months.	

This Final Report includes both statewide and health district level immunization analyses. It contains an overview of data collection, sampling

methodology, and a discussion of the study findings. Additional reports on related topics are discussed in Appendices D, E, and F. Findings specific to Varicella are discussed in Appendix D. A report on the immunization site (public or private provider) is included in Appendix E. Margins of error for immunization coverage rates are included in Appendix F.

SECTION II:

METHODOLOGY

SECTION II: METHODOLOGY

Research Design

The twelfth year of the Georgia Immunization Study employed a non-experimental retrospective cohort research design in order to ascertain the immunization coverage rate for children born in the State of Georgia in January 2006. In this retrospective study, all of the immunizations should have occurred prior to the initiation of the project. However, during the data collection time period children that were not up-to-date on all immunizations were allowed to receive their shots. The study design allowed for the calculation of immunization rates for children who turned two in January 2008. Identifying information about the children and their parents was obtained from birth certificates.

Target and Sample Populations

The target population of the twelfth year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 2006. A sample size of 2,557 children born in the month of January 2006 was selected for the study. The sample design allowed for independent estimates for each of the 18 health districts in the state. (See Appendix A for a description of the sampling plan.) The final estimate for the state is based on weighted data to account for differential probabilities of selection for each health district.

Dr. John Carter, Epidemiologist and Assistant Professor at the Rollins School of Public Health, drew a stratified random sample (by health district) from the total births in the state for January 2006. Information for each child, including all birth certificate variables available, was downloaded into an ASCII file. Examples of the type of birth certificate information obtained for each child include:

- ❖ Health district of birth
- ❖ County of birth
- ❖ Infant's first, middle, and last name
- ❖ Infant's sex

- ❖ Infant's date of birth
- ❖ Infant's address
- ❖ Medicaid status of mother at birth of child
- ❖ Mother's first, middle, and last name
- ❖ Father's first, middle, and last name (if available)
- ❖ Mother's race
- ❖ Mother's level of education

Preparation for Data Collection

Public health representatives in each health district completed the data collection procedures. Division of Public Health staff trained the representatives via a conference call during January 2008. During this training, the public health representatives:

- ❖ Received an overview of childhood immunizations
- ❖ Learned the data collection process and locating methods
- ❖ Were taught information on recording data on the data collection form
- ❖ Were instructed in confidentiality and professional etiquette

This information as well as other pertinent details were defined in the Public Health Representative Training Manual presented to each representative at the training. This manual was developed by the staff at the Rollins School of Public Health in 1996-97, and has been revised and updated by the staff at the Georgia Division of Public Health for use in each subsequent study year.

Data Form Development

The Georgia Division of Public Health, Epidemiology Section, revised the standardized data collection form developed by the staff at the Rollins School of Public Health. (See Appendix C for a copy of the data collection form.) The form followed the recommended schedule of childhood immunizations jointly approved by the Advisory Committee on Immunization Practices (ACIP), the American

Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).

The data collection form contained four distinct sections to be completed by the public health representatives, and included identifying information from the child's birth certificate.

The section titled "Part A: Identifying Information" included the identifying information for each child as well as a code number to uniquely identify each record. This section also included an area for the representatives to record any changes to identifying information (i.e., change of address).

The immunization dates for each particular vaccination were recorded in the section labeled "Part B: Immunization History." There were spaces available for five Diphtheria, Tetanus, Pertussis (DTP/DTaP) vaccines, four Polio (OPV/IPV) vaccines, two Measles, Mumps, Rubella (MMR) vaccines, five *Haemophilus Influenza* type B (Hib) vaccines, four Hepatitis B (Hep B) vaccines, two Varicella vaccines, and four Pneumococcal Conjugate (PCV) vaccines. The data collection form provided at least one extra space for each vaccine to accommodate instances where a child was over-immunized. In this section the representative also noted the location where each individual vaccine was given (Health Department, Private Physician, or Unknown). See Appendix E for a report of the "Provider of Immunizations" information.

The next section, "Part C: Tracking Log", provided space for representatives to chronicle all activities performed for each record. This section aided the representatives in their work by documenting where they were in the abstraction process at any point in time. The section also enabled the State staff to understand the steps necessary to find each child's immunization history and to clarify notations made by the representative in Part D of the form.

"Part D: Data Collection" is designed to track where the data were collected and the reason data abstraction ended for each individual record. This information was used to understand why the representative returned the record to the State and to determine if any evidence of the child was found.

Data Collection Protocol

Step #1: Search for immunization records at local health departments.

In this step, representatives reviewed computerized files or immunization cards for shot dates. Representatives also used these files to find updated contact information for families. Representatives were instructed to check with Women, Infants, and Children (WIC) offices, for updated contact information as well.

Step #2: Search for immunization records through the parent(s).

In this step, representatives used the contact information from the birth certificate or any updated contact information found at the health department to contact the parent. Representatives also used sources such as city phone directories, directory assistance, and the Internet to find current contact information for parents. Parents were then contacted by phone and letter and asked to provide an immunization history or the location of immunization information (i.e., the name of the doctor or clinic office). Representatives also sent consent forms to parents.

Note about Field Visits: In some cases, representatives made home visits to collect data. This practice was encouraged if the representative was comfortable with it.

Step #3: Search for immunization records through private physician(s).

In this step, representatives contacted private physicians and requested the child's immunization history. Most physicians provided the information by phone or fax, once a copy of the parent's consent form was received. Some provided the information with a verbal parental consent. Others cooperated by checking a list of children from the sample against their patient list. Some

physicians preferred that representatives visit their offices in person to collect the data. Representatives were instructed to collect the information by the method (e.g., phone, fax, personal visit) most convenient to the doctor's office. In most cases, nurses, office managers, and records clerks were the main contacts for representatives collecting data in private physician offices.

Representatives returned completed data collection forms to the Georgia Immunization Program on a weekly basis via United States (U.S.) mail. The returned forms were reviewed by staff for correctness and completeness. ("Completeness" here refers not to immunization status, but to *completion of the abstraction process*, i.e., that a representative did all he or she could do to document a child's entire immunization record.) If a form was incorrectly filled out or incomplete, the public health representative was contacted for clarification.

The immunization dates and location for each record were then entered into an Epi Info Version 6.04 data file. This program was developed specifically for this study in Year Two, revised in Year Three by Ms. Alperin, Co-Principal Investigator and again in subsequent study years by Dr. Hoban.

Data Entry

The co-principal investigators and co-project assistants reviewed each record prior to entry into the Epi Info database. Attempts were made to resolve any unclear information with the public health representative before data entry.

Data cleaning and double data entry were done in the month of September 2009. Ten percent of the data were re-entered and correlated with the original forms to look for data entry errors and estimate the error rate for the final sample. A data reliability rate of approximately 97% was found.

Analysis Plan

The plan for the analysis was very similar to that used in the previous years. Additionally, trends from the previous five years of the study are shown in this Final Report. Epi Info was the main software program used to assess immunization coverage rates, and provide a measure of where the immunizations were given. The analyses include univariate, bivariate, and multivariate analyses to produce a clear description of the immunization status of two-year-old children in the State of Georgia.

SECTION III:

RESULTS OF STATEWIDE ANALYSES

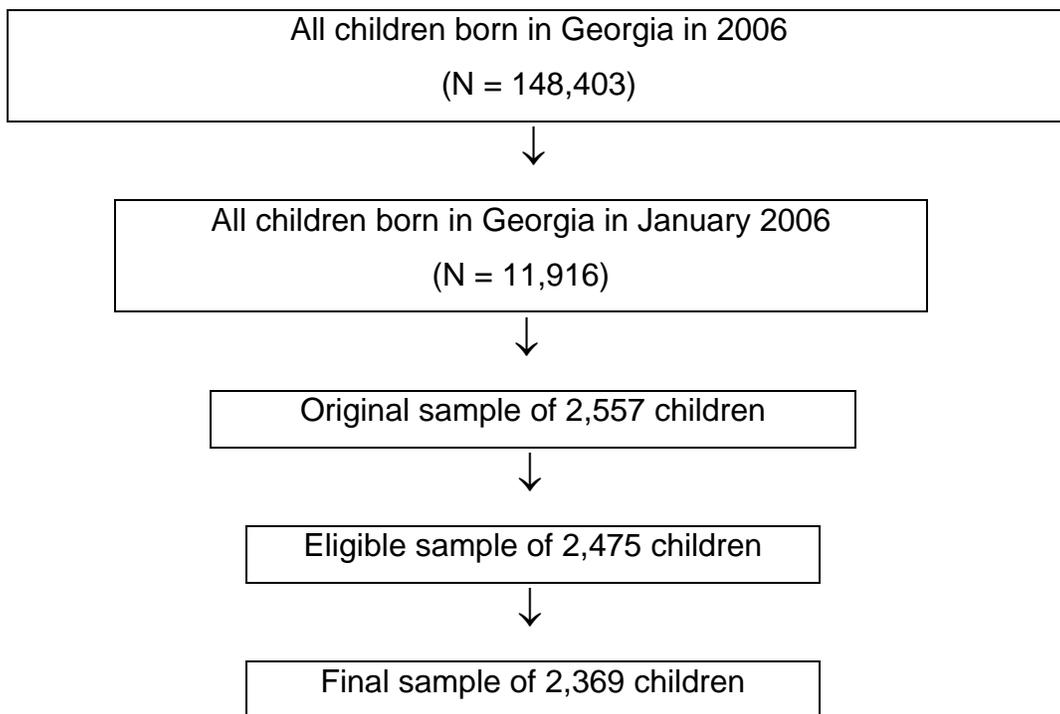
SECTION III: RESULTS OF STATEWIDE ANALYSES

Sampling

A sample of 2,557 children was drawn from 11,916 children born in Georgia in January 2006. A total of 148,403 children were born in Georgia during 2006.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 2,475. Ineligible children were those who were deceased, adopted, moved out of state, or were known to be part of a military family. Figure 1 below depicts the stages of the sampling procedure.

Figure 1: Sampling Procedure



Of the 2,475 children in the eligible sample, 2,383 children were located, 92 children never were located and 14 parental refusals were removed. The resulting final sample consisted of 2,369 children. The final sample represents the children for whom parental consent was given to have their child's immunization record included in this study. The children who were never

located were those for whom no evidence beyond the birth certificate could be found to confirm that the child existed. The final sample of 2,369 children represented 92.6% of the original sample and more than 96% of the eligible sample.

Table 2:
Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	2,557	100.0%
Deceased	3	0.1%
Adopted	11	0.4%
Moved out of state	62	2.4%
Military	6	0.2%
Eligible Sample	2,475	96.8%
Eligible Sample	2,475	100.0%
Records Not Located /Eligibility Unknown *	106	4.3%
Final Sample (Located Records**)	2,369	96.8%

* **Records Not Located / Eligibility Unknown** - This category refers to records where no evidence of a child's existence was found beyond birth certificate data (including those records where only one Hepatitis B shot was given at birth [n=45] or if a parent refused to participate in the study).

** **Located Records** – This category refers to all records where *evidence of a child's existence* was found, regardless of the child's immunization status. The supposition here is that, if evidence of a child's existence was found, it is possible to also find documentation of that child's immunization status. This category includes records where:

- a) a provider refused to participate in the study;
- b) no immunization record was available due to documented religious objection;
- c) a provider could not be found (this implies contact with a parent, who would have provided evidence of the child's existence);
- d) no immunization record was available due to documented medical exemption;
- e) a parent could not be found, but shot dates were found elsewhere

Response Rates

Table 3 and Figure 2 depict the district and state response rates for the 2008 study. The response rates are the number of records located divided by the total number of records in the sample. Response rates provide some indication of the ease or difficulty of accessing records of the children in the study as well as the quality of data collection. As noted in the last column of Table 3, response rates are reported as a percentage of the eligible sample. In reviewing the response rates based on the eligible sample, the district response rates range from a low of 91.9% to a high of 100%, with a statewide average response rate of 96.8%.

Table 3:

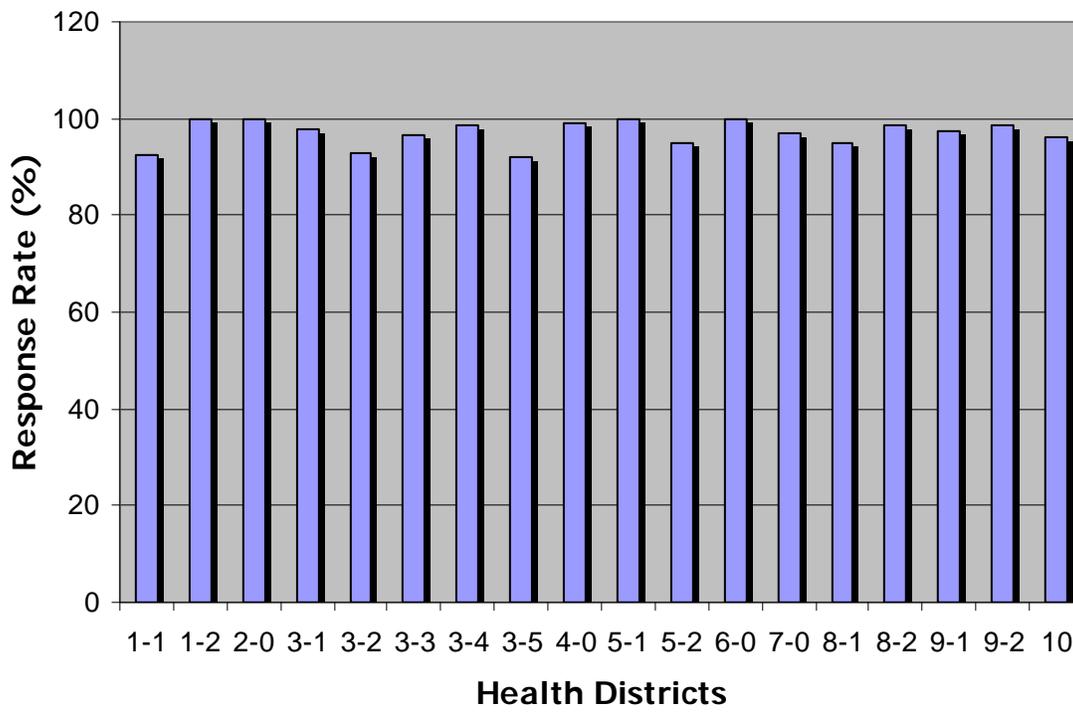
2008 Eligible Sample, Number Located and Response Rates by District

Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	170	157	92.4%
1-2	59	59	100.0%
2-0	50	50	100.0%
3-1	187	183	97.9%
3-2	290	269	92.8%
3-3	205	198	96.6%
3-4	74	73	98.6%
3-5	173	159	91.9%
4-0	186	184	98.9%
5-1	62	62	100.0%
5-2	139	132	95.0%
6-0	45	45	100.0%
7-0	156	151	96.8%
8-1	122	116	95.1%
8-2	141	139	98.6%
9-1	115	112	97.4%
9-2	166	164	98.8%
10-0	135	130	96.3%
State	2,475	2,396	96.8%

*Parental refusals included

**number located / eligible sample

Figure 2: 2008 Response Rates by District



Parent Refusals by District:

Table 4 shows the number of parents who refused to participate in the study.

Table 4:
Parent Refusals by Health District for the 2008 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent (%)
1-1	157	0	0.0
1-2	59	1	1.7
2-0	50	0	0.0
3-1	183	4	2.2
3-2	269	2	0.7
3-3	198	0	0.0
3-4	73	1	1.4
3-5	159	2	1.3
4-0	184	0	0.0
5-1	62	1	1.6
5-2	132	1	0.8
6-0	45	0	0.0
7-0	151	0	0.0
8-1	116	0	0.0
8-2	139	2	1.4
9-1	112	0	0.0
9-2	164	0	0.0
10-0	130	0	0.0
Total	2,396	14	0.6

Parent refusals are defined as situations where the parent told the public health representative that he/she did not want to participate in the study.

Statewide Immunization Results

The immunization rates that were calculated for this report included only the final sample of 2,369 children. All reported immunization rates include information from both public and private providers. Since "adequate immunization status" is defined differently by different authorities, the Georgia Immunization Study has evaluated immunization status in different ways:

- ❖ "4:3:1:3:3:1:3" status: a child has received four DTP/DaTP, three OPV/IPV, one MMR, three Hib, three Hep B, one Varicella at anytime, and three doses of PCV
- ❖ "4:3:1:3:3:1" status a child has received four DTP/DaTP, three OPV/IPV, one MMR, three Hib, three Hep B, and one Varicella at anytime

Table 5 illustrates the percent of the children in the final samples in the last five years of this study who were adequately immunized with the 4:3:1:3:3:1 series compared to the children in the final sample who were not adequately immunized with this series.

Of the 2,369 children who were located in 2008, 77.8% were adequately immunized at the 4:3:1:3:3:1 level. This percent of adequately immunized children was similar to the 78% reported in 2007.

Table 5:
4:3:1:3:3:1 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	%	Number	%
2004	2,150	81.3	495	18.7
2005	2,015	76.5	619	23.5
2006	1,790	76.8	541	23.2
2007	1,919	78.0	542	22.0
2008	1,844	77.8	525	22.2

Note: State rates based on data weighted by health district.

Table 6 illustrates the percent of the children in the final sample who were adequately immunized with the 4:3:1:3 series compared to the children in the final sample who were not adequately immunized with this series. This is a newer assessment of immunization coverage and will continue to be used in future study years.

Table 6:
4:3:1:3:3:1:3 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	%	Number	%
2007	1,885	76.6	576	23.4
2008	1,836	77.5	533	22.5

Note: State rates based on data weighted by health district.

Figure 3: 2006-2008 Statewide Coverage
4:3:1:3:3:1 and 4:3:1:3:3:1:3

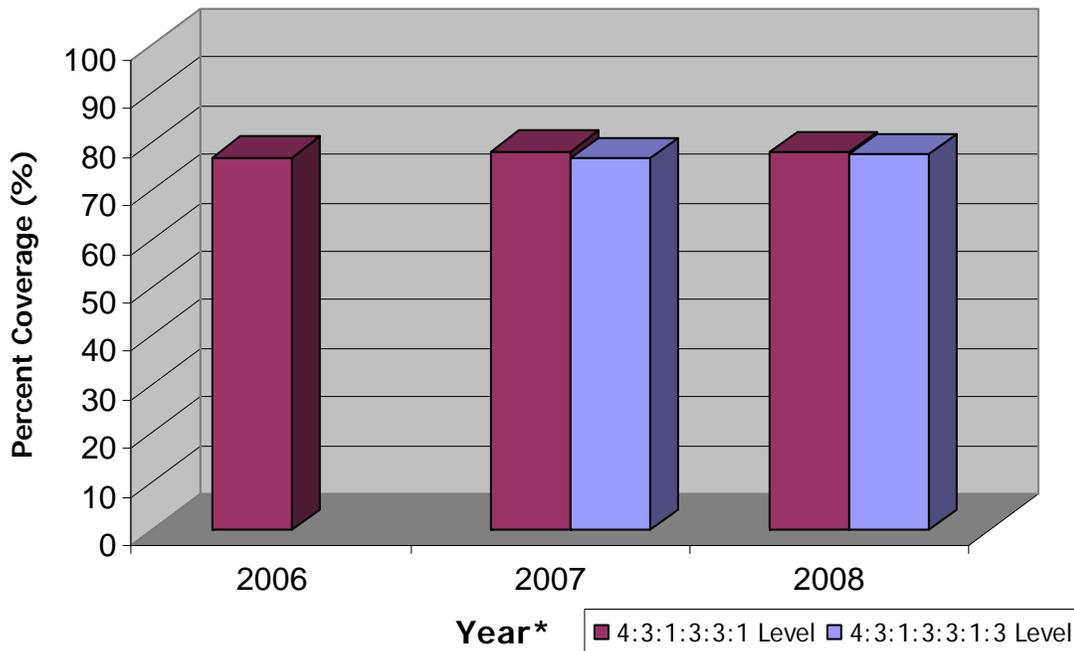


Figure 3 shows the statewide 4:3:1:3:3:1 coverage rates for the 2006, 2007 and 2008 studies. The figure also shows statewide 4:3:1:3:3:1:3 vaccination coverage rates for the 2007 and 2008 studies.

The statewide immunization status for each individual vaccine series is presented in Table 7. This table illustrates the number and percent of children who were adequately immunized with each of the recommended vaccines. Vaccines which are part of the 4:3:1:3:3:1 shot series are shown here. In 2004, all but one of the vaccine series met the coverage rate of 90%. Coverage levels for 2005 and 2006 decreased slightly, but still showed most of the vaccines near the 90% coverage rate with the 3 DTP/DtaP above 90%. In 2007, coverage for the 3 Hep B series was also above 90%. The 2008 statewide coverage rates range from 78% for the 4+ doses of the pneumococcal conjugate vaccine to 93% for the 3+ doses of DTP/DTaP. Although relatively low when compared to the other coverage rates, the 4+ doses of PCV has increased by 100% since 2005 and by 325% since 2004. In addition, the 3+ dose PCV coverage has increased

by 15% since 2005 and by 90% since 2004. (Note: The Hib vaccine status can be considered adequate with three or four shots, depending on the manufacturer of the vaccine. For this study, adequate immunization status for the Hib vaccines was calculated considering three Hib shots as "adequate").

Table 7:
State Immunization Status by Vaccine Series by Study Year

Vaccine	2004		2005		2006		2007		2008	
	Number	%								
3 DTP/DTaP	2,459	93.0	2,428	92.2	2,147	92.1	2,261	91.9	2,203	93.0
4 DTP/DTaP	2,268	85.7	2,169	82.3	1,907	81.8	2,034	82.6	2,002	84.5
3 OPV/IPV	2,401	90.8	2,315	87.9	2,076	89.1	2,209	89.8	2,164	91.3
1 MMR	2,405	90.9	2,296	87.2	2,070	88.8	2,185	88.8	2,142	90.4
3 Hib	2,387	90.2	2,306	87.5	2,062	88.5	2,145	87.2	2,037	86.0
3 Hep B	2,400	90.7	2,337	88.7	2,081	89.3	2,223	90.3	2,173	91.7
1 Varicella	2,378	89.9	2,302	87.4	2,070	88.8	2,169	88.1	2,135	90.1
3 PCV	1,262	47.7	2,080	79.0	1,970	84.5	2,189	88.9	2,151	90.8
4 PCV	485	18.3	1,024	38.9	1,453	62.3	1,799	73.1	1,846	77.9

Note: State rates based on data weighted by health district.

In addition to examining at the immunization status of the children in the sample at two years of age, the study also reviewed data on the immunization status of the children at one year of age. Table 8 provides an overview of the immunization status of the children in the final sample of the 2004, 2005, 2006, 2007, and 2008 studies at one year of age, looking at coverage status by individual doses of vaccine.

**Table 8:
Statewide Immunization Status by
Individual Vaccines at 12 Months of Age**

Vaccine	Number 2004	Percent* 2004	Number 2005	Percent* 2005	Number 2006	Percent* 2006	Number 2007	Percent* 2007	Number 2008	Percent* 2008
DTP/DTaP1	2,554	96.6%	2,545	96.6%	2,269	97.3%	2,349	95.4%	2,274	96.0%
DTP/DTaP2	2,472	93.5%	2,451	93.1%	2,193	94.1%	2,280	92.6%	2,205	93.1%
DTP/DTaP3	2,255	85.3%	2,253	85.5%	1,992	85.5%	2,117	86.0%	2,035	85.9%
DTP/DTaP4	26	1.0%	25	0.9%	9	0.4%	8	0.3%	11	0.5%
DTP/DTaP5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
OPV/IPV1	2,553	96.5%	2,541	96.5%	2,262	97.0%	2,357	95.8%	2,272	95.9%
OPV/IPV2	2,458	92.9%	2,433	92.4%	2,181	93.6%	2,286	92.9%	2,197	92.7%
OPV/IPV3	1,132	42.8%	1,275	48.4%	1,339	57.4%	1,542	62.7%	1,494	63.1%
OPV/IPV4	5	0.2%	9	0.3%	9	0.4%	4	0.2%	6	0.3%
MMR1**	110	4.2%	96	3.6%	24	1.0%	93	3.8%	87	3.7%
MMR2	0	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
HIB1	2,541	96.1%	2,531	96.1%	2,262	97.0%	2,353	95.6%	2,260	95.4%
HIB2	2,446	92.5%	2,407	91.4%	2,156	92.5%	2,263	92.0%	2,163	91.3%
HIB3	1,063	40.2%	955	36.3%	789	33.8%	687	27.9%	663	28.0%
HIB4	25	0.9%	32	1.2%	9	0.4%	8	0.3%	9	0.4%
HIB5	0	0.0%	1	0.0%	0	0.0%	0	0.0%	2	0.1%
HEPB1	2,551	96.4%	2,549	96.8%	2,273	97.5%	2,368	96.2%	2,283	96.4%
HEPB2	2,478	93.7%	2,463	93.5%	2,199	94.3%	2,307	93.7%	2,234	94.3%
HEPB3	1,229	46.5%	1,342	50.9%	1,442	61.9%	1,593	64.7%	1,556	65.7%
HEPB4	26	1.0%	92	3.5%	193	8.3%	239	9.7%	235	9.9%
VAR1**	136	5.1%	115	4.4%	27	1.2%	97	3.9%	96	4.1%
VAR2	0	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
PCV1	---	---	2,359	89.6%	2,167	93.0%	2,314	94.0%	2,248	94.9%
PCV2	---	---	2,209	83.9%	2,041	87.6%	2,223	90.3%	2,158	91.1%
PCV3	---	---	1,796	68.2%	1,570	67.4%	1,984	80.6%	1,914	80.8%
PCV4	---	---	25	2.1%	23	1.0%	59	2.4%	66	2.8%

*Percents are calculated as (number immunized/sample size).

**The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday.

Sample Sizes: 2004 study = 2,645; 2005 study = 2,634; 2006 study = 2,331; 2007 study = 2,461; 2008 study = 2,369.

Tables 9-15 present the state and district rates for each individual vaccine during the 2004, 2005, 2006, 2007, and 2008 data collection periods.

As shown in Table 9, 2008 district immunization rates for the DTP/DTaP vaccines ranged from 75.3% to 97.8%, with a statewide rate of 84.5% receiving all four doses. The 2008 statewide DTP/DTaP rate is 2.3 percent higher than the rate from the 2007 study year.

**Table 9:
State and District Immunization Rates
for DTP/DTaP by Study Year**

District	2004 Rates 4 DTP/DTaP	2005 Rates 4 DTP/DTaP	2006 Rates 4 DTP/DTaP	2007 Rates 4 DTP/DTaP	2008 Rates 4 DTP/DTaP
1-1	85.3%	82.3%	82.2%	84.6%	83.4%
1-2	88.2%	97.8%	100.0%	95.5%	86.2%
2-0	100%	97.8%	92.6%	97.6%	92.0%
3-1	78.8%	79.0%	75.2%	83.6%	86.0%
3-2	78.8%	73.8%	68.6%	63.1%	75.3%
3-3	67.4%	58.6%	78.0%	75.0%	76.3%
3-4	94.1%	92.4%	94.9%	96.3%	95.8%
3-5	82.4%	74.0%	76.5%	84.2%	84.1%
4-0	79.1%	83.9%	75.0%	83.1%	81.5%
5-1	85.5%	94.7%	89.6%	93.9%	88.5%
5-2	87.1%	88.5%	94.7%	88.5%	86.3%
6-0	90.5%	94.8%	98.6%	97.9%	97.8%
7-0	88.4%	90.3%	90.0%	79.0%	84.8%
8-1	89.5%	94.3%	89.7%	87.4%	91.4%
8-2	94.9%	87.1%	77.2%	83.0%	88.3%
9-1	97.5%	87.0%	85.1%	82.9%	83.9%
9-2	83.0%	86.0%	83.7%	89.1%	89.0%
9-3	83.1%	82.6%	---	---	---
10-0	94.3%	93.5%	94.4%	87.5%	86.2%
State	85.7%	82.3%	81.8%	82.6%	84.5%

Note: State rates based on data weighted by health district.

Table 10 shows the 2004, 2005, 2006, 2007, and 2008 state and district rates for the OPV/IPV vaccines. The 2008 district coverage rates for these vaccines varied between 84.3% and 100.0%. The 2008 statewide immunization rate for OPV/IPV was 91.3%, which is 1.6 percent higher than the previous year's study rate.

Table 10:
State and District Immunization Rates
for OPV/IPV by Study Year

District	2004 Rates 3 OPV/IPV	2005 Rates 3 OPV/IPV	2006 Rates 3 OPV/IPV	2007 Rates 3 OPV/IPV	2008 Rates 3 OPV/IPV
1-1	89.9%	89.0%	91.4%	94.0%	94.9%
1-2	92.2%	98.5%	100.0%	97.7%	91.4%
2-0	100.0%	97.8%	96.3%	98.8%	92.0%
3-1	83.5%	86.2%	83.5%	90.7%	93.9%
3-2	85.0%	81.1%	80.9%	72.6%	84.6%
3-3	74.4%	68.4%	85.4%	90.1%	84.3%
3-4	96.1%	90.2%	97.4%	96.3%	97.2%
3-5	89.5%	83.1%	81.1%	88.2%	88.5%
4-0	85.6%	87.1%	88.6%	93.3%	87.0%
5-1	92.7%	96.0%	95.8%	97.0%	96.7%
5-2	93.2%	94.2%	96.9%	93.6%	93.9%
6-0	94.8%	97.4%	100.0%	100.0%	100.0%
7-0	93.5%	92.9%	96.0%	88.6%	93.4%
8-1	96.1%	97.7%	91.4%	95.8%	96.6%
8-2	97.7%	91.9%	85.8%	89.7%	93.4%
9-1	98.8%	94.4%	93.5%	90.0%	92.9%
9-2	90.4%	93.3%	92.7%	93.0%	95.1%
9-3	88.0%	88.7%	---	---	---
10-0	98.9%	98.4%	94.4%	91.3%	90.8%
State	90.8%	87.9%	89.1%	89.8%	91.3%

Note: State rates based on data weighted by health district.

Table 11 shows the 2004, 2005, 2006, 2007, and 2008 state and district rates for MMR. The 2008 district rates for MMR ranged from a low of 82.3% to a high of 97.8%, with a statewide rate of 90.4% coverage. The 2008 statewide rate for the MMR vaccine has risen by 1.8 percent since 2007.

**Table 11:
State and District Immunization
Rates for MMR by Study Year**

District	2004 Rates 1 MMR	2005 Rates 1 MMR	2006 Rates 1 MMR	2007 Rates 1 MMR	2008 Rates 1 MMR
1-1	91.3%	87.8%	92.0%	90.7%	94.3%
1-2	94.1%	97.8%	100.0%	97.7%	91.4%
2-0	100.0%	97.8%	92.6%	98.8%	96.0%
3-1	86.3%	82.1%	87.2%	88.5%	91.1%
3-2	82.7%	80.4%	81.6%	72.2%	83.5%
3-3	75.6%	65.6%	86.0%	82.9%	82.3%
3-4	96.1%	91.3%	95.7%	95.1%	95.8%
3-5	90.8%	84.8%	84.4%	90.0%	89.2%
4-0	85.0%	89.3%	83.2%	88.9%	88.6%
5-1	90.9%	96.0%	100.0%	98.5%	93.4%
5-2	93.2%	92.1%	95.4%	92.3%	96.2%
6-0	95.7%	94.8%	98.6%	100.0%	97.8%
7-0	93.0%	93.8%	95.0%	90.5%	91.4%
8-1	92.1%	97.7%	89.7%	94.7%	94.8%
8-2	97.7%	93.5%	87.4%	90.9%	94.2%
9-1	98.8%	92.6%	91.1%	90.7%	86.6%
9-2	89.6%	92.1%	86.2%	93.8%	93.9%
9-3	89.2%	87.0%	---	---	---
10-0	97.7%	98.4%	94.4%	92.3%	90.0%
State	90.9%	87.2%	88.8%	88.8%	90.4%

Note: State rates based on data weighted by health district.

As shown in Table 12, 2008 district immunization rates for the Hib vaccine varied between 75.3% and 100.0%. The statewide Hib coverage rate in 2008 was 86.0%, a decrease of 1.4 percent from the 2007 statewide rate of 87.2%.

**Table 12:
State and District Immunization
Rates for Hib by Study Year**

District	2004 Rates 3 Hib	2005 Rates 3 Hib	2006 Rates 3 Hib	2007 Rates 3 Hib	2008 Rates 3 Hib
1-1	90.8%	87.2%	89.0%	91.2%	89.8%
1-2	94.1%	97.8%	100.0%	97.7%	89.7%
2-0	100.0%	95.7%	96.3%	96.4%	88.0%
3-1	82.1%	84.1%	87.2%	86.7%	86.0%
3-2	84.1%	81.4%	81.6%	69.1%	77.9%
3-3	76.7%	71.7%	86.0%	83.6%	75.3%
3-4	96.7%	92.4%	95.7%	95.1%	95.8%
3-5	88.3%	82.3%	84.4%	86.4%	84.7%
4-0	86.6%	88.8%	83.2%	89.8%	84.2%
5-1	87.3%	96.0%	93.8%	92.4%	86.9%
5-2	91.2%	90.6%	97.7%	87.2%	87.0%
6-0	92.2%	94.8%	98.6%	97.9%	100.0%
7-0	93.0%	91.2%	92.0%	86.7%	87.4%
8-1	94.7%	96.6%	93.1%	97.9%	94.0%
8-2	98.3%	93.5%	91.3%	90.3%	85.4%
9-1	98.8%	94.4%	93.5%	88.6%	91.1%
9-2	91.1%	91.5%	86.2%	91.5%	88.4%
9-3	84.3%	88.7%	---	---	---
10-0	95.5%	98.4%	97.2%	89.4%	88.5%
State	90.2%	87.5%	88.5%	87.2%	86.0%

Note: State rates based on data weighted by health district.

The slight decrease in Hib coverage from 2006 to 2008 could partially be due to the nationwide Hib shortage that began in December 2007. The decline resulted in a temporary ACIP recommendation to defer the Hib booster dose (dose #4), given at age 12-15 months. However, it is conceivable that the shortage could have affected coverage even at the 3-dose level.

Table 13 reports the statewide and district immunization coverage rates for the Hepatitis B vaccine. In 2008, the district coverage rates varied from a low of 83.9% to 100.0%. The 2008 statewide rate of 91.7% for the Hepatitis B vaccine was 1.6 percent higher than the 2007 statewide rate of 90.3%.

Table 13:
State and District Immunization Rates
for Hep B by Study Year

District	2004 Rates 3 Hep B	2005 Rates 3 Hep B	2006 Rates 3 Hep B	2007 Rates 3 Hep B	2008 Rates 3 Hep B
1-1	90.8%	89.0%	92.0%	94.0%	96.2%
1-2	94.1%	98.5%	100.0%	97.7%	93.1%
2-0	98.5%	93.5%	96.3%	98.8%	96.0%
3-1	83.0%	83.6%	86.7%	90.7%	91.6%
3-2	85.4%	81.1%	78.0%	72.6%	83.9%
3-3	77.9%	75.0%	86.6%	91.4%	86.4%
3-4	96.7%	91.3%	95.7%	96.3%	95.8%
3-5	89.1%	82.3%	80.2%	89.1%	89.2%
4-0	86.1%	90.2%	89.7%	92.9%	88.0%
5-1	90.9%	96.0%	97.9%	93.9%	98.4%
5-2	91.8%	92.1%	96.9%	92.3%	94.7%
6-0	94.0%	95.7%	100.0%	100.0%	100.0%
7-0	93.5%	93.8%	97.0%	91.4%	90.1%
8-1	96.1%	97.7%	94.8%	97.9%	94.8%
8-2	97.7%	98.4%	89.8%	93.9%	97.1%
9-1	100.0%	96.3%	92.9%	89.3%	92.9%
9-2	90.4%	95.7%	90.2%	94.6%	97.0%
9-3	86.7%	90.4%	---	---	---
10-0	94.3%	98.4%	94.4%	92.3%	91.5%
State	90.7%	88.7%	89.3%	90.3%	91.7%

Note: State rates based on data weighted by health district.

Table 14 reports Varicella coverage rates among the health districts and statewide by study year. Children reported to have had Varicella disease are not considered in the results below. For a more detailed description of Varicella rates including prior history of disease, see Appendix D. The district coverage rates ranged from 82.8% to 97.8%, with a statewide coverage rate of 90.1% for the Varicella vaccine. This is a 2.3 percent increase from the 2007 Varicella rate of 88.1%.

Table 14:
State and District Immunization
Rates for Varicella by Study Year

District	2004 Rates 1 Varicella	2005 Rates 1 Varicella	2006 Rates 1 Varicella	2007 Rates 1 Varicella	2008 Rates 1 Varicella
1-1	89.0%	87.2%	92.0%	90.1%	94.3%
1-2	95.1%	97.8%	100.0%	97.7%	89.7%
2-0	98.5%	97.8%	92.6%	98.8%	96.0%
3-1	83.5%	82.6%	84.9%	86.7%	89.9%
3-2	81.4%	78.5%	81.2%	70.3%	83.5%
3-3	74.4%	67.2%	86.0%	82.9%	82.8%
3-4	94.1%	92.4%	95.7%	96.3%	94.4%
3-5	89.5%	85.7%	84.8%	89.1%	88.5%
4-0	85.0%	89.7%	83.7%	88.9%	86.4%
5-1	90.9%	97.3%	97.9%	97.0%	93.4%
5-2	91.2%	92.8%	96.9%	92.3%	93.9%
6-0	94.8%	93.9%	98.6%	100.0%	97.8%
7-0	93.5%	93.8%	96.0%	89.5%	91.4%
8-1	92.1%	96.6%	91.4%	94.7%	95.7%
8-2	97.7%	93.5%	85.0%	90.3%	93.4%
9-1	98.8%	94.4%	92.9%	88.6%	89.3%
9-2	90.4%	93.3%	87.8%	94.6%	94.5%
9-3	88.0%	87.8%	---	---	---
10-0	94.3%	98.4%	93.1%	93.3%	86.9%
State	89.9%	87.4%	88.8%	88.1%	90.1%

Notes: State rates based on data weighted by health district.

Table 15 reports the statewide and district immunization coverage rates for the PCV vaccine. In 2008, the district coverage rates varied from a low of 83.5% to 98.4%. The statewide rate of 90.8% in 2008 is 2.1 percent higher than the rate of 88.9% in 2007 and nearly 15 percent higher than the rate of 79% in 2005.

Table 15:
State and District Immunization
Rates for PCV by Study Year

District	2005 Rates 3 PCV	2006 Rates 3 PCV	2007 Rates 3 PCV	2008 Rates 3 PCV
1-1	81.1%	82.2%	92.3%	94.9%
1-2	95.5%	100.0%	95.5%	91.4%
2-0	95.7%	96.3%	96.4%	94.0%
3-1	82.1%	87.6%	92.0%	93.3%
3-2	79.8%	79.4%	73.2%	83.5%
3-3	62.7%	78.7%	88.2%	85.4%
3-4	90.2%	95.7%	95.1%	97.2%
3-5	73.2%	77.8%	90.0%	90.4%
4-0	78.1%	81.5%	89.8%	89.1%
5-1	82.7%	87.5%	95.5%	98.4%
5-2	69.1%	90.1%	91.0%	93.1%
6-0	90.4%	97.3%	93.6%	97.8%
7-0	67.3%	82.0%	89.5%	89.4%
8-1	88.6%	87.9%	94.7%	94.0%
8-2	85.5%	81.1%	90.9%	89.8%
9-1	75.9%	82.7%	85.7%	89.0%
9-2	79.3%	89.4%	92.2%	95.7%
9-3	73.9%	---	---	---
10-0	91.9%	90.3%	91.3%	92.3%
State	79.0%	84.5%	88.9%	90.8%

Notes: State rates based on data weighted by health district.

Summary of Statewide Analyses

The statewide analyses reviewed both the study's process of measuring immunization rates and the rates themselves. In measuring immunization rates, the study assessed rates on two levels: 4:3:1:3:3:1 and 4:3:1:3:3:1:3 coverage.

In reviewing rates at the most commonly used level of coverage, 4:3:1:3:3:1 coverage, all but one of the immunization rates during the 2008 study year were higher than the rates measured by this study during 2007. Coverage increases ranged from 1.6% for the OPV/IPV and Hepatitis B series to 2.3% for both the DTP/DTaP and Varicella series. Coverage for the Hib vaccine was the exception, decreasing by 1.4 percent since 2007.

SECTION IV:
RESULTS OF DISTRICT LEVEL
ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

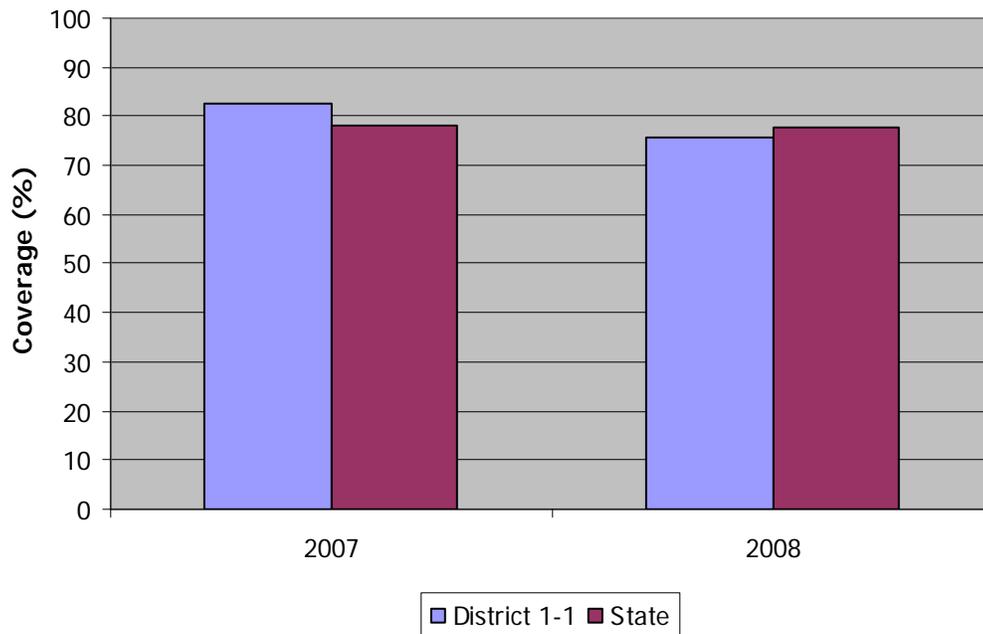
The immunization rates for this twelfth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: 2008 Eligible Sample, Number Located and Response Rates by District. The rates reported are based on information collected from both public and private providers. Summaries of all district rates are included in Section III: Statewide Rates, specifically Tables 9-15. The Individual District Reports include immunization rates for each recommended vaccine as well as, 4:3:1:3:3:1 and 4:3:1:3:3:1:3 rates. Although statistical analyses would be informative for each of the districts, sub-category sample sizes in the cross tabulation tables were too small for such analyses to be interpreted and generalized to the target population.

Individual Health District Report: District 1-1

The eligible sample from this district included 170 children born in January 2006. From the 170 children, 157 records were located (Response Rate=92.4%). Of the 157 located records, there were no parental refusals leaving a final sample of 157 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 75.8% (119/157).** This rate is 2.6% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 4: Coverage for State and District 1-1
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 75.2% (147/182).** This rate is 3% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 16:
District Immunization Rates for
Health District 1-1 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	85.3%	79.5%	82.2%	84.6%	83.4%
3 OPV/IPV	89.9%	88.8%	91.4%	94.0%	94.9%
1 MMR	91.3%	87.6%	92.0%	90.7%	94.3%
3 Hib	90.8%	87.0%	89.0%	91.2%	89.8%
3 HepB	90.8%	88.8%	92.0%	94.0%	96.2%
1 Varicella	89.0%	87.0%	92.0%	90.1%	94.3%
3 PCV	51.4%	82.0%	82.2%	92.3%	94.9%
4 PCV	15.6%	44.1%	69.9%	78.0%	79.6%

Table 16 reveals the coverage rates of each vaccine series. Coverage rates ranged from 79.6 to 96.2% for the 2008 study data.

Table 17 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 17:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	154	98.1%
DTP2/DTaP2	150	95.5%
DTP3/DTaP3	139	88.5%
DTP4/DTaP4	1	0.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	154	98.1%
OPV/IPV2	150	95.5%
OPV/IPV3	110	70.1%
OPV/IPV4	1	0.6%
MMR1	5	3.2%
MMR2	0	0.0%
HIB1	153	97.5%
HIB2	149	94.9%
HIB3	40	25.5%
HIB4	2	1.3%
HIB5	0	0.0%
HEPB1	154	98.1%
HEPB2	152	96.8%
HEPB3	130	82.8%
HEPB4	48	30.6%
VAR1	3	1.9%
VAR2	0	0.0%
PCV1	153	97.5%
PCV2	148	94.3%
PCV3	132	84.1%
PCV4	6	3.8%
PCV5	1	0.6%

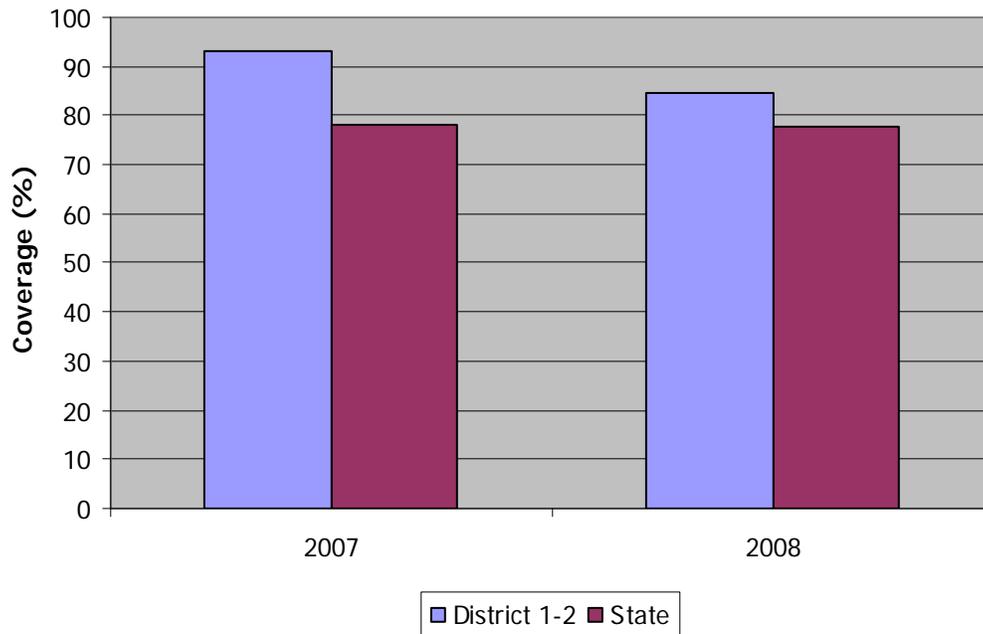
*Percent = number immunized / sample size
sample size = 157

Individual Health District Report: District 1-2

The eligible sample from this district included 59 children born in January 2006. From these children, 59 records were located (Response Rate=100.0%). Of the 59 located records, there was 1 parental refusal leaving a final sample of 58 records.

- ❖ **4:3:1:3:3:1 immunization coverage estimate 84.5% (49/58).** This rate is 8.6% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 5: Coverage for State and District 1-2
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **4:3:1:3:3:1:3 immunization coverage estimate 84.5% (49/58).** This rate is 1.4% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

Table 18:
District Immunization Rates
Health District 1-2 by Study Year

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	88.2%	97.8%	100.0%	95.5%	86.2%
3 OPV/IPV	92.2%	98.5%	100.0%	97.7%	91.4%
1 MMR	94.1%	97.8%	100.0%	97.7%	91.4%
3 Hib	94.1%	97.8%	100.0%	97.7%	89.7%
3 HepB	94.1%	98.5%	100.0%	97.7%	93.1%
1 Varicella	95.1%	97.8%	100.0%	97.7%	89.7%
3 PCV	56.9%	95.5%	100.0%	95.5%	91.4%
4 PCV	14.7%	52.2%	81.1%	86.4%	87.9%

Table 18 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 86.2% to 93.1% for the 2008 study data.

Table 19 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 19:
2008 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 1-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	54	93.1%
DTP2/DTaP2	53	91.4%
DTP3/DTaP3	47	81.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	53	91.4%
OPV/IPV2	53	91.4%
OPV/IPV3	43	74.1%
OPV/IPV4	1	1.7%
MMR1	1	1.7%
MMR2	0	0.0%
HIB1	54	93.1%
HIB2	52	89.7%
HIB3	11	19.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	55	94.8%
HEPB2	53	91.4%
HEPB3	35	60.3%
HEPB4	4	6.9%
VAR1	1	1.7%
VAR2	0	0.0%
PCV1	54	93.1%
PCV2	53	91.4%
PCV3	45	77.6%
PCV4	2	3.4%
PCV5	0	0.0%

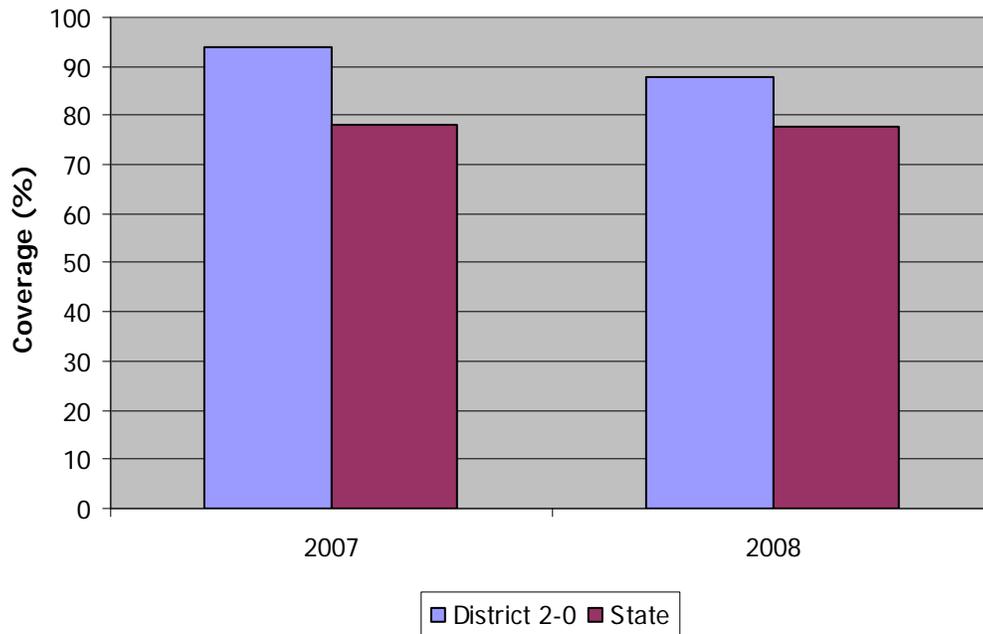
*Percent = number immunized / sample size
Sample size = 58

Individual Health District Report: District 2-0

The eligible sample from this district included 50 children born in January 2006. From the 50 children, 50 records were located (Response rate = 100%). Of the 50 located records, there were no parental refusals leaving a final sample of 50 records.

- ❖ **4:3:1:3:3:1 immunization coverage estimate is 88.0% (44/50).** This rate is 13% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 6: Coverage for State and District 2-0
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **4:3:1:3:3:1:3 immunization coverage estimate is 88.0% (44/50).** This rate is 13.5% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 20:
District Immunization Rates for
Health District 2-0 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	100%	97.8%	92.6%	97.6%	92.0%
3 OPV/IPV	100%	97.8%	96.3%	98.8%	92.0%
1 MMR	100%	97.8%	92.6%	98.8%	96.0%
3 Hib	100%	95.7%	96.3%	96.4%	88.0%
3 HepB	100%	93.5%	96.3%	98.8%	96.0%
1 Varicella	98.5%	97.8%	92.6%	98.8%	96.0%
3 PCV	77.6%	95.7%	96.3%	96.4%	94.0%
4 PCV	28.4%	65.2%	74.1%	89.3%	92.0%

Table 20 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 88.0% to 96.0% for the 2008 study data.

Table 21 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 21:
2008 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 2-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	48	96.0%
DTP2/DTaP2	48	96.0%
DTP3/DTaP3	47	94.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	48	96.0%
OPV/IPV2	47	94.0%
OPV/IPV3	20	40.0%
OPV/IPV4	0	0.0%
MMR1	1	2.0%
MMR2	0	0.0%
HIB1	48	96.0%
HIB2	47	94.0%
HIB3	9	18.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	48	96.0%
HEPB2	48	96.0%
HEPB3	20	40.0%
HEPB4	2	4.0%
VAR1	1	2.0%
VAR2	0	0.0%
PCV1	48	96.0%
PCV2	48	96.0%
PCV3	47	94.0%
PCV4	0	0.0%
PCV5	0	0.0%

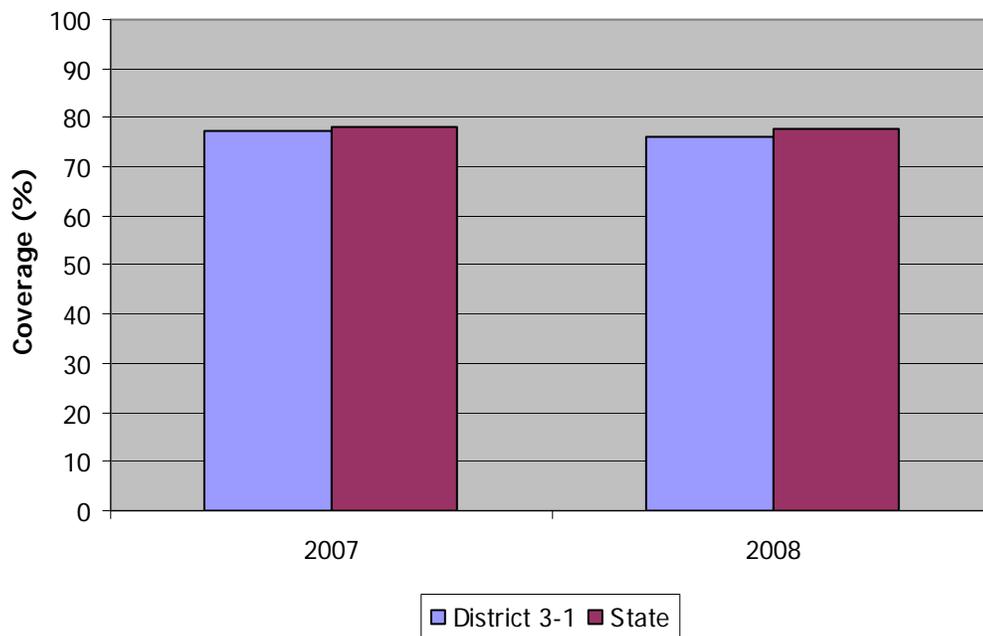
*Percent = number immunized / sample size
Sample size = 50

Individual Health District Report: District 3-1

The eligible sample from this district included 187 children born in January 2006. From the 187 children, 183 records were located (Response Rate=97.9%). Of the 183 located records, there were 4 parental refusals leaving a final sample of 179 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 76.0% (136/179).** This rate is 2.3% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 7: Coverage for State and District 3-1
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 75.4% (135/179).** This rate is 2.7% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

Table 22:
District Immunization Rates for
Health District 3-1 by Study Year

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	78.8%	79.0%	75.2%	83.6%	86.0%
3 OPV/IPV	83.5%	86.2%	83.5%	90.7%	93.9%
1 MMR	86.3%	82.1%	87.2%	88.5%	91.1%
3 Hib	82.1%	84.1%	86.2%	86.7%	86.0%
3 HepB	83.0%	83.6%	86.7%	90.7%	91.6%
1 Varicella	83.5%	82.6%	84.9%	86.7%	89.9%
3 PCV	46.7%	82.1%	87.6%	92.0%	93.3%
4 PCV	23.1%	45.6%	68.8%	81.0%	79.9%

Table 22 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 79.9% to 93.9% for the 2008 study data.

Table 23 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 23:
2008 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	174	97.2%
DTP2/DTaP2	172	96.1%
DTP3/DTaP3	165	92.2%
DTP4/DTaP4	3	1.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	174	97.2%
OPV/IPV2	172	96.1%
OPV/IPV3	117	65.4%
OPV/IPV4	1	0.6%
MMR1	10	5.6%
MMR2	0	0.0%
HIB1	173	96.6%
HIB2	167	93.3%
HIB3	55	30.7%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	174	97.2%
HEPB2	171	95.5%
HEPB3	108	60.3%
HEPB4	5	2.8%
VAR1	9	5.0%
VAR2	0	0.0%
PCV1	172	96.1%
PCV2	169	94.4%
PCV3	157	87.7%
PCV4	9	5.0%
PCV5	0	0.0%

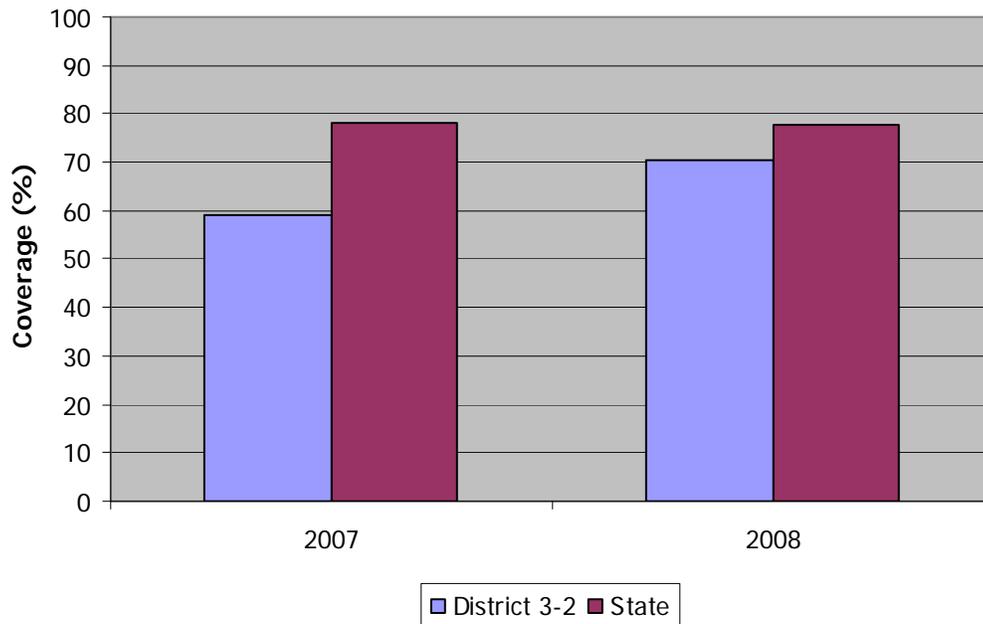
*Percent = number immunized / sample size
Sample size = 179

Individual Health District Report: District 3-2

The eligible sample from this district included 290 children born in January 2006. From the 290 children, 269 records were located (Response Rate=92.8%). Of the 269 located records, there were 2 parental refusals leaving a final sample of 267 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 70.4% (188/267).** This rate is 9.5% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 8: Coverage for State and District 3-2
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 70.4% (188/267).** This rate is 9.2% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 24:
District Immunization Rates for
Health District 3-2 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	78.8%	73.8%	68.6%	63.1%	75.3%
3 OPV/IPV	85.0%	81.1%	80.9%	72.6%	84.6%
1 MMR	82.7%	80.4%	81.6%	72.2%	83.5%
3 Hib	84.1%	81.4%	80.9%	69.1%	77.9%
3 HepB	85.4%	81.1%	78.0%	72.6%	83.9%
1 Varicella	81.4%	78.5%	81.2%	70.3%	83.5%
3 PCV	66.8%	79.8%	79.4%	73.2%	83.5%
4 PCV	35.8%	47.6%	58.8%	56.5%	70.0%

Table 24 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 70.0% to 84.6% for the 2008 study data.

Table 25 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 25:
2008 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	246	92.1%
DTP2/DTaP2	230	86.1%
DTP3/DTaP3	211	79.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	244	91.4%
OPV/IPV2	227	85.0%
OPV/IPV3	162	60.7%
OPV/IPV4	0	0.0%
MMR1	10	3.7%
MMR2	0	0.0%
HIB1	242	90.6%
HIB2	221	82.8%
HIB3	79	29.6%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	247	92.5%
HEPB2	235	88.0%
HEPB3	151	56.6%
HEPB4	7	2.6%
VAR1	10	3.7%
VAR2	0	0.0%
PCV1	244	91.4%
PCV2	225	84.3%
PCV3	202	75.7%
PCV4	6	2.2%
PCV5	0	0.0%

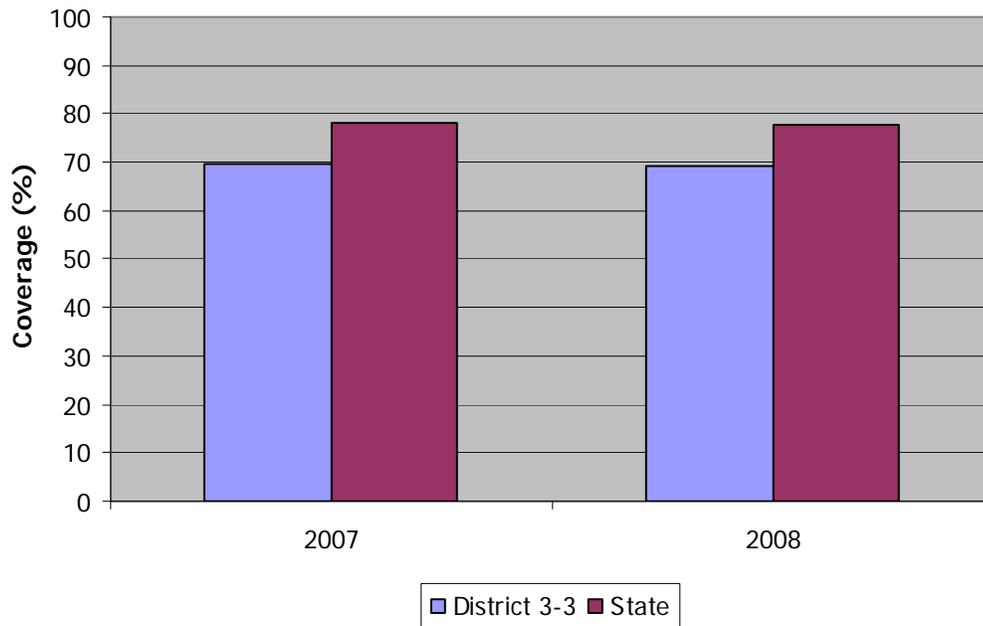
*Percent = number immunized / sample size
Sample size = 267

Individual Health District Report: District 3-3

The eligible sample from this district included 205 children born in January 2006. From the 205 children, 198 records were located (Response Rate=96.6%). Of the 198 located records, there were no parental refusals leaving a final sample of 198 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 69.2% (137/198).** This rate is 11% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 9: Coverage for State and District 3-3
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 68.7% (136/198).** This rate is 11% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

Table 26:
District Immunization Rates for
Health District 3-3 by Study Year

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	67.4%	58.6%	78.0%	75.0%	76.3%
3 OPV/IPV	74.4%	68.4%	85.4%	90.1%	84.3%
1 MMR	75.6%	65.6%	86.0%	82.9%	82.3%
3 Hib	76.7%	71.7%	84.8%	83.6%	75.3%
3 HepB	77.9%	75.0%	86.6%	91.4%	86.4%
1 Varicella	74.4%	67.2%	86.0%	82.9%	82.8%
3 PCV	30.2%	62.7%	78.7%	88.2%	85.4%
4 PCV	11.6%	22.5%	52.4%	54.6%	68.2%

Table 26 reveals the coverage rates of each vaccine series. Coverage rates ranged from 68.2% to 86.4% for the 2008 study data.

Table 27 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 27:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-3**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	180	90.9%
DTP2/DTaP2	174	87.9%
DTP3/DTaP3	157	79.3%
DTP4/DTaP4	1	0.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	180	90.9%
OPV/IPV2	173	87.4%
OPV/IPV3	130	65.7%
OPV/IPV4	0	0.0%
MMR1	9	4.5%
MMR2	0	0.0%
HIB1	181	91.4%
HIB2	172	86.9%
HIB3	57	28.8%
HIB4	2	1.0%
HIB5	0	0.0%
HEPB1	180	90.9%
HEPB2	176	88.9%
HEPB3	144	72.7%
HEPB4	19	9.6%
VAR1	7	3.5%
VAR2	0	0.0%
PCV1	180	90.9%
PCV2	173	87.4%
PCV3	148	74.7%
PCV4	5	2.5%
PCV5	0	0.0%

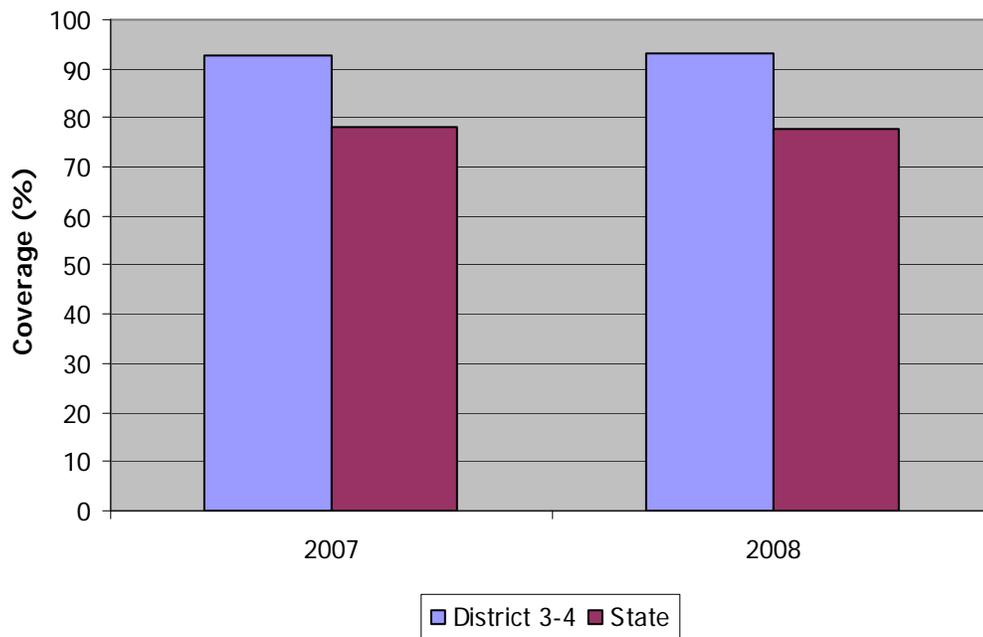
*Percent = number immunized / sample size
Sample size = 198

Individual Health District Report: District 3-4

The eligible sample from this district included 74 children born in January 2006. From the 74 children, 73 records were located (Response Rate=98.6%). Of the 73 located records, there was 1 parental refusal leaving a final sample of 72 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 93.1% (67/72).** This rate is 19.7% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 10: Coverage for State and District 3-4
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 93.1% (67/72).** This rate is 20.1% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 28:
District Immunization Rates for
Health District 3-4 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	94.1%	92.4%	94.9%	96.3%	95.8%
3 OPV/IPV	96.1%	90.2%	97.4%	96.3%	97.2%
1 MMR	96.1%	91.3%	95.7%	95.1%	95.8%
3 Hib	96.7%	92.4%	96.6%	95.1%	95.8%
3 HepB	96.7%	91.3%	95.7%	96.3%	95.8%
1 Varicella	94.1%	92.4%	95.7%	96.3%	94.4%
3 PCV	76.5%	90.2%	95.7%	95.1%	97.2%
4 PCV	40.5%	53.3%	81.2%	88.9%	91.7%

Table 28 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 91.7% to 97.2% for the 2008 study data.

Table 29 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 29:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-4**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	71	98.6%
DTP2/DTaP2	71	98.6%
DTP3/DTaP3	66	91.7%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	71	98.6%
OPV/IPV2	71	98.6%
OPV/IPV3	49	68.1%
OPV/IPV4	0	0.0%
MMR1	1	1.4%
MMR2	0	0.0%
HIB1	70	97.2%
HIB2	70	97.2%
HIB3	29	40.3%
HIB4	1	1.4%
HIB5	0	0.0%
HEPB1	72	100.0%
HEPB2	71	98.6%
HEPB3	54	75.0%
HEPB4	7	9.7%
VAR1	2	2.8%
VAR2	0	0.0%
PCV1	71	98.6%
PCV2	71	98.6%
PCV3	64	88.9%
PCV4	1	1.4%
PCV5	0	0.0%

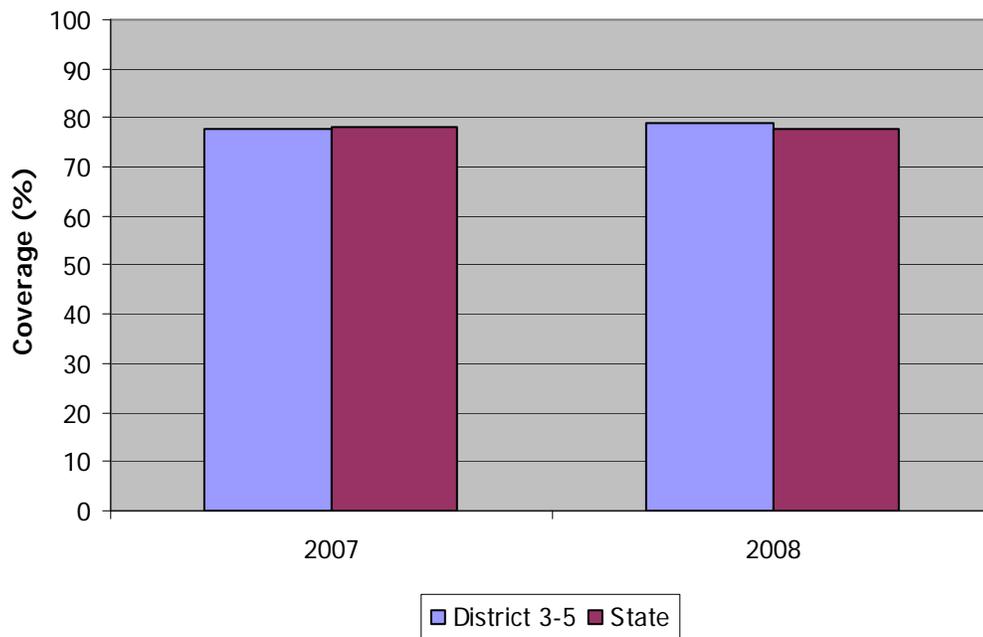
*Percent = number immunized / sample size
Sample size = 72

Individual Health District Report: District 3-5

The eligible sample from this district included 173 children born in January 2006. From the 173 children, 159 records were located (Response Rate=91.9%). Of the 159 located records, there were 2 parental refusals leaving a final sample of 157 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 79.0% (124/157).** This rate is 1.5% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 11: Coverage for State and District 3-5
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 79.0% (124/157).** This rate is 1.9% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 30:
District Immunization Rates for
Health District 3-5 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	82.4%	74.0%	76.5%	84.2%	84.1%
3 OPV/IPV	89.5%	83.1%	81.1%	88.2%	88.5%
1 MMR	90.8%	84.8%	84.4%	90.0%	89.2%
3 Hib	88.3%	82.3%	79.4%	86.4%	84.7%
3 HepB	89.1%	82.3%	80.2%	89.1%	89.2%
1 Varicella	89.5%	85.7%	84.8%	89.1%	88.5%
3 PCV	43.5%	73.2%	77.8%	90.0%	90.4%
4 PCV	19.7%	38.5%	51.4%	73.8%	78.3%

Table 30 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 78.3% to 90.4% for the 2008 study data.

Table 31 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 31:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-5**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	149	94.9%
DTP2/DTaP2	144	91.7%
DTP3DTaP3	134	85.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	151	96.2%
OPV/IPV2	143	91.1%
OPV/IPV3	98	62.4%
OPV/IPV4	1	0.6%
MMR1	7	4.5%
MMR2	0	0.0%
HIB1	149	94.9%
HIB2	139	88.5%
HIB3	42	26.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	151	96.2%
HEPB2	149	94.9%
HEPB3	110	70.1%
HEPB4	3	1.9%
VAR1	11	7.0%
VAR2	0	0.0%
PCV1	157	100.0%
PCV2	149	94.9%
PCV3	126	80.3%
PCV4	4	2.5%
PCV5	0	0.0%

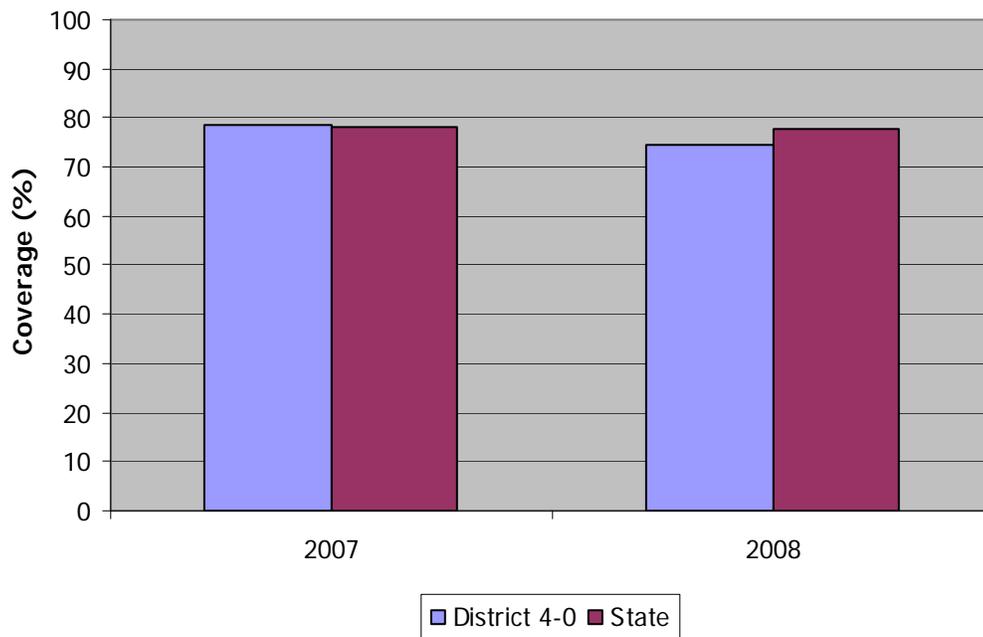
*Percent = number immunized / sample size
Sample size = 157

Individual Health District Report: District 4-0

The eligible sample from this district included 186 children born in January 2006. From the 186 children, 184 records were located (Response Rate=98.9%). Of the 184 located records, there were no parental refusals leaving a final sample of 184 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 74.5% (137/184).** This rate is 4.2% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%

**Figure 12: Coverage for State and District 4-0
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 74.5% (137/184).** This rate is 3.9% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%

**Table 32:
District Immunization Rates for
Health District 4-0 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	79.1%	83.9%	75.0%	83.1%	81.5%
3 OPV/IPV	85.6%	87.0%	88.6%	93.3%	87.0%
1 MMR	85.0%	89.2%	83.2%	88.9%	88.6%
3 Hib	86.6%	88.8%	84.8%	89.8%	84.2%
3 HepB	86.1%	90.1%	89.7%	92.9%	88.0%
1 Varicella	85.0%	89.7%	83.7%	88.9%	86.4%
3 PCV	32.1%	78.0%	81.5%	89.8%	89.1%
4 PCV	9.1%	26.9%	58.2%	71.1%	75.0%

Table 32 reveals the coverage rates of each vaccine series. Coverage rates ranged from 75.0% to 89.1% for the 2008 study data.

Table 33 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 33:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	173	94.0%
DTP2/DTaP2	164	89.1%
DTP3/DTaP3	151	82.1%
DTP4/DTaP4	1	0.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	172	93.5%
OPV/IPV2	163	88.6%
OPV/IPV3	117	63.6%
OPV/IPV4	0	0.0%
MMR1	9	4.9%
MMR2	0	0.0%
HIB1	174	94.6%
HIB2	163	88.6%
HIB3	33	17.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	173	94.0%
HEPB2	170	92.4%
HEPB3	116	63.0%
HEPB4	15	8.2%
VAR1	9	4.9%
VAR2	0	0.0%
PCV1	174	94.6%
PCV2	163	88.6%
PCV3	145	78.8%
PCV4	6	3.3%
PCV5	0	0.0%

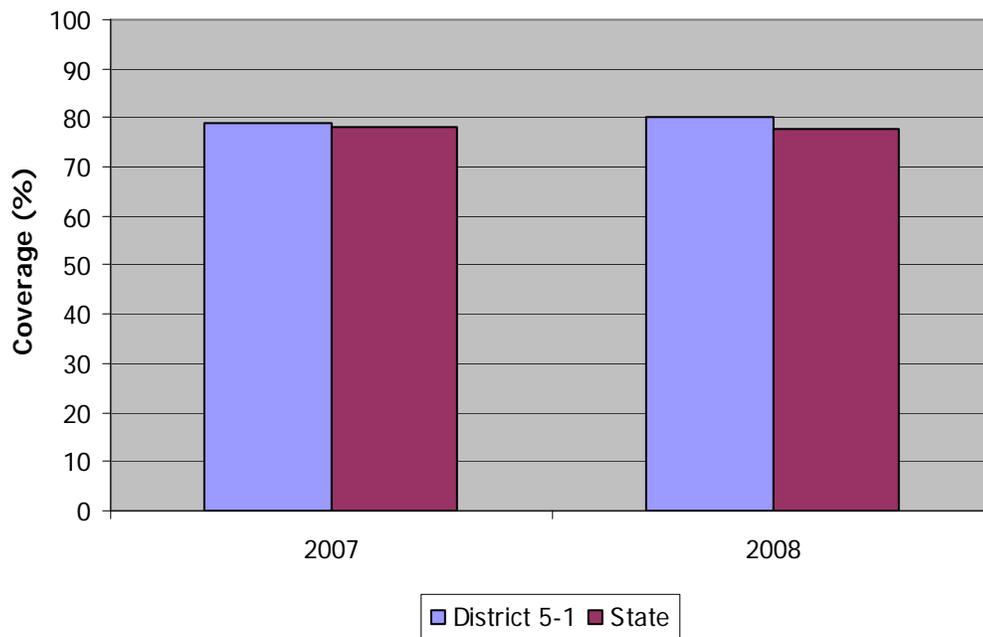
*Percent = number immunized / sample size
Sample size = 184

Individual Health District Report: District 5-1

The eligible sample from this district included 62 children born in January 2006. From the 62 children, 62 records were located (Response Rate=100.0%). Of the 62 located records, there was 1 parental refusal leaving a final sample of 61 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate 80.3% (49/61).** This rate is 3.2% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 13: Coverage for State and District 5-1
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate 80.3% (49/61).** This rate is 3.6% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 34:
District Immunization Rates for
Health District 5-1 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	85.5%	94.7%	89.6%	93.9%	88.5%
3 OPV/IPV	92.7%	96.0%	95.8%	97.0%	96.7%
1 MMR	90.9%	96.0%	100.0%	98.5%	93.4%
3 Hib	87.3%	96.0%	93.8%	92.4%	86.9%
3 HepB	90.9%	96.0%	97.8%	93.9%	98.4%
1 Varicella	90.9%	97.3%	97.9%	97.0%	93.4%
3 PCV	23.6%	82.7%	87.5%	95.5%	98.4%
4 PCV	3.6%	32.0%	72.9%	78.8%	86.9%

Table 34 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 86.9% to 98.4% for the 2008 study data.

Table 35 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 35:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	61	100.0%
DTP2/DTaP2	59	96.7%
DTP3/DTaP3	56	91.8%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	61	100.0%
OPV/IPV2	59	96.7%
OPV/IPV3	39	63.9%
OPV/IPV4	0	0.0%
MMR1	1	1.6%
MMR2	0	0.0%
HIB1	61	100.0%
HIB2	58	95.1%
HIB3	9	14.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	61	100.0%
HEPB2	59	96.7%
HEPB3	51	83.6%
HEPB4	17	27.9%
VAR1	1	1.6%
VAR2	0	0.0%
PCV1	61	100.0%
PCV2	59	96.7%
PCV3	56	91.8%
PCV4	2	3.3%
PCV5	0	0.0%

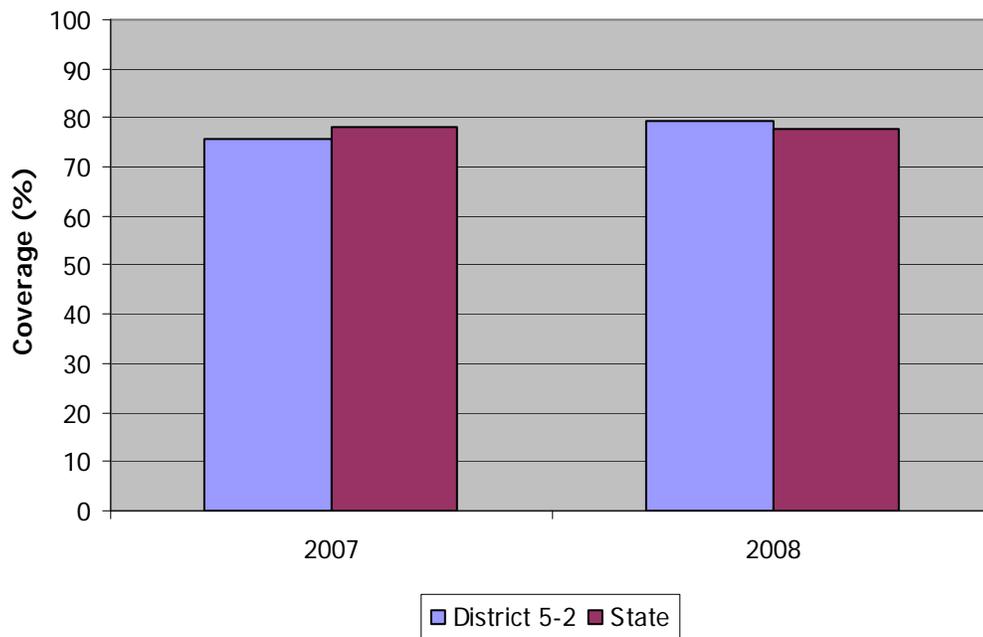
*Percent = number immunized / sample size
Sample size = 61

Individual Health District Report: District 5-2

The eligible sample from this district included 139 children born in January 2006. From the 139 children, 132 records were located (Response Rate=95.0%). Of the 132 located records, there was 1 parental refusal leaving a final sample of 131 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 79.4% (104/131).** This rate is 2.1% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 14: Coverage for State and District 5-2
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 77.1% (101/131).** This rate is 0.5% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 36:
District Immunization Rates for
Health District 5-2 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	87.1%	88.5%	94.7%	88.5%	86.3%
3 OPV/IPV	93.2%	94.2%	96.9%	93.6%	93.9%
1 MMR	93.2%	92.1%	95.4%	92.3%	96.2%
3 Hib	91.2%	90.6%	97.7%	87.2%	87.0%
3 HepB	91.8%	92.1%	96.9%	92.3%	94.7%
1 Varicella	91.2%	92.8%	96.9%	92.3%	93.9%
3 PCV	39.5%	69.1%	90.1%	91.0%	93.1%
4 PCV	15.0%	36.0%	68.7%	84.6%	74.0%

Table 36 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 74.0% to 96.2% for the 2008 study data.

Table 37 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 37:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	128	97.7%
DTP2/DTaP2	121	92.4%
DTP3/DTaP3	112	85.5%
DTP4/DTaP4	1	0.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	129	98.5%
OPV/IPV2	122	93.1%
OPV/IPV3	81	61.8%
OPV/IPV4	0	0.0%
MMR1	2	1.5%
MMR2	0	0.0%
HIB1	124	94.7%
HIB2	118	90.1%
HIB3	30	22.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	130	99.2%
HEPB2	127	96.9%
HEPB3	76	58.0%
HEPB4	10	7.6%
VAR1	4	3.1%
VAR2	0	0.0%
PCV1	128	97.7%
PCV2	118	90.1%
PCV3	99	75.6%
PCV4	0	0.0%
PCV5	0	0.0%

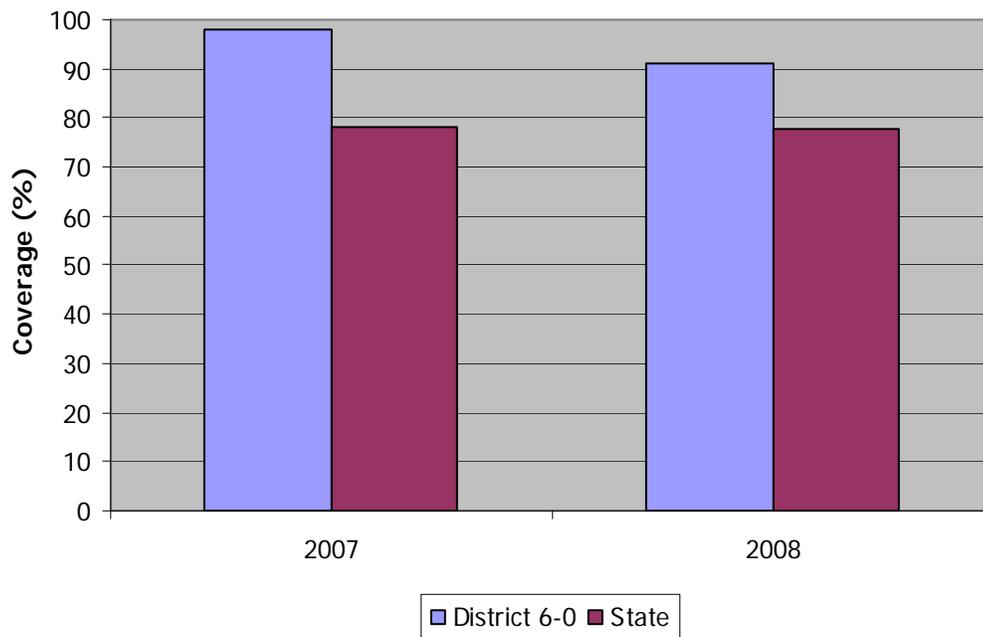
*Percent = number immunized / sample size
Sample size = 131

Individual Health District Report: District 6-0

The eligible sample from this district included 45 children born in January 2006. From the 45 children, 45 records were located (Response Rate=100.0%). Of the 45 located records, there were no parental refusals leaving a final sample of 45 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 91.1% (41/45).** This rate is 17.1% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 15: Coverage for State and District 6-0
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 91.1% (41/45).** This rate is 17.5% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 38:
District Immunization Rates for
Health District 6-0 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	90.5%	94.8%	98.6%	97.9%	97.8%
3 OPV/IPV	94.8%	97.4%	100.0%	100.0%	100.0%
1 MMR	95.7%	94.8%	98.6%	100.0%	97.8%
3 Hib	92.2%	94.8%	98.6%	97.9%	100.0%
3 HepB	94.0%	95.7%	100.0%	100.0%	100.0%
1 Varicella	94.8%	93.9%	98.6%	100.0%	97.8%
3 PCV	54.3%	90.4%	97.3%	93.6%	97.8%
4 PCV	23.3%	52.2%	82.4%	89.4%	86.7%

Table 38 reveals the coverage rates of each vaccine series. Coverage rates ranged from 86.7% to 100.0% for the 2008 study data.

Table 39 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 39:
2008 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 6-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	45	100.0%
DTP2/DTaP2	45	100.0%
DTP3/DTaP3	41	91.1%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	45	100.0%
OPV/IPV2	45	100.0%
OPV/IPV3	31	68.9%
OPV/IPV4	0	0.0%
MMR1	4	8.9%
MMR2	0	0.0%
HIB1	45	100.0%
HIB2	45	100.0%
HIB3	21	46.7%
HIB4	1	2.2%
HIB5	0	0.0%
HEPB1	45	100.0%
HEPB2	44	97.8%
HEPB3	40	88.9%
HEPB4	17	37.8%
VAR1	3	6.7%
VAR2	0	0.0%
PCV1	45	100.0%
PCV2	44	97.8%
PCV3	37	82.2%
PCV4	3	6.7%
PCV5	0	0.0%

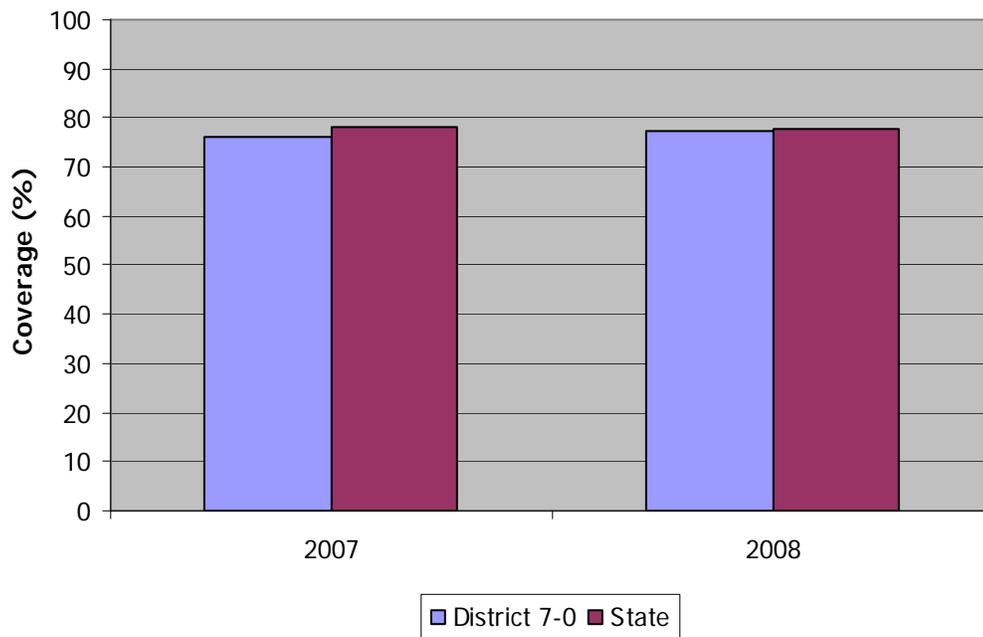
*Percent = number immunized / sample size
Sample size = 45

Individual Health District Report: District 7-0

The eligible sample from this district included 156 children born in January 2006. From the 156 children, 151 records were located (Response Rate=96.8%). Of the 151 located records, there were no parental refusals leaving a final sample of 151 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 77.5% (117/151).** This rate is 0.4% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 16: Coverage for State and District 7-0
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 76.8% (116/151).** This rate is 0.9% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 40:
District Immunization Rates for
Health District 7-0 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	88.4%	90.3%	90.0%	79.0%	84.8%
3 OPV/IPV	93.5%	92.9%	96.0%	88.6%	93.4%
1 MMR	93.0%	93.8%	95.0%	90.5%	91.4%
3 Hib	93.0%	91.2%	92.0%	86.7%	87.4%
3 HepB	93.5%	93.8%	97.0%	91.4%	90.1%
1 Varicella	93.5%	93.8%	96.0%	89.5%	91.4%
3 PCV	34.2%	67.3%	82.0%	89.5%	89.4%
4 PCV	10.1%	35.4%	52.0%	68.6%	78.1%

Table 40 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 78.1% to 93.4% for the 2008 study data.

Table 41 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 41:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 7-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	145	96.0%
DTP2/DTaP2	140	92.7%
DTP3/DTaP3	128	84.8%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	144	95.4%
OPV/IPV2	140	92.7%
OPV/IPV3	75	49.7%
OPV/IPV4	1	0.7%
MMR1	4	2.6%
MMR2	0	0.0%
HIB1	144	95.4%
HIB2	140	92.7%
HIB3	52	34.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	142	94.0%
HEPB2	139	92.1%
HEPB3	99	65.6%
HEPB4	3	2.0%
VAR1	5	3.3%
VAR2	0	0.0%
PCV1	141	93.4%
PCV2	134	88.7%
PCV3	123	81.5%
PCV4	3	2.0%
PCV5	0	0.0%

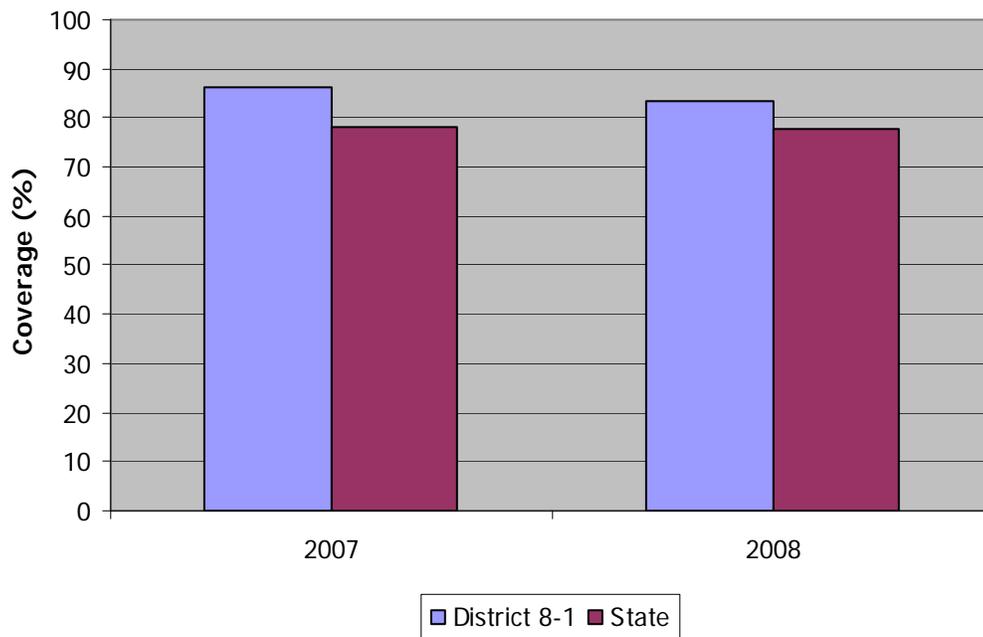
*Percent = number immunized / sample size
Sample size = 151

Individual Health District Report: District 8-1

The eligible sample from this district included 122 children born in January 2006. From the 122 children, 116 records were located (Response Rate=95.1%). Of the 116 located records, there were no parental refusals leaving a final sample of 116 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 83.6% (97/116).** This rate is 7.5% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 17: Coverage for State and District 8-1
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 82.8% (96/116).** This rate is 6.8% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 42:
District Immunization Rates for
Health District 8-1 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	89.5%	94.3%	89.7%	87.4%	91.4%
3 OPV/IPV	96.1%	97.7%	91.4%	95.8%	96.6%
1 MMR	92.1%	97.7%	89.7%	94.7%	94.8%
3 Hib	94.7%	96.6%	93.1%	97.9%	94.0%
3 HepB	96.1%	97.7%	94.8%	97.9%	94.8%
1 Varicella	92.1%	96.6%	91.4%	94.7%	95.7%
3 PCV	39.5%	88.6%	87.9%	94.7%	94.0%
4 PCV	13.2%	31.8%	53.4%	80.0%	83.6%

Table 42 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 83.6% to 96.6% for the 2008 study data.

Table 43 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 43:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	114	98.3%
DTP2/DTaP2	112	96.6%
DTP3/DTaP3	105	90.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	114	98.3%
OPV/IPV2	112	96.6%
OPV/IPV3	69	59.5%
OPV/IPV4	0	0.0%
MMR1	3	2.6%
MMR2	0	0.0%
HIB1	114	98.3%
HIB2	112	96.6%
HIB3	36	31.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	116	100.0%
HEPB2	113	97.4%
HEPB3	54	46.6%
HEPB4	1	0.9%
VAR1	4	3.4%
VAR2	0	0.0%
PCV1	111	95.7%
PCV2	109	94.0%
PCV3	99	85.3%
PCV4	4	3.4%
PCV5	0	0.0%

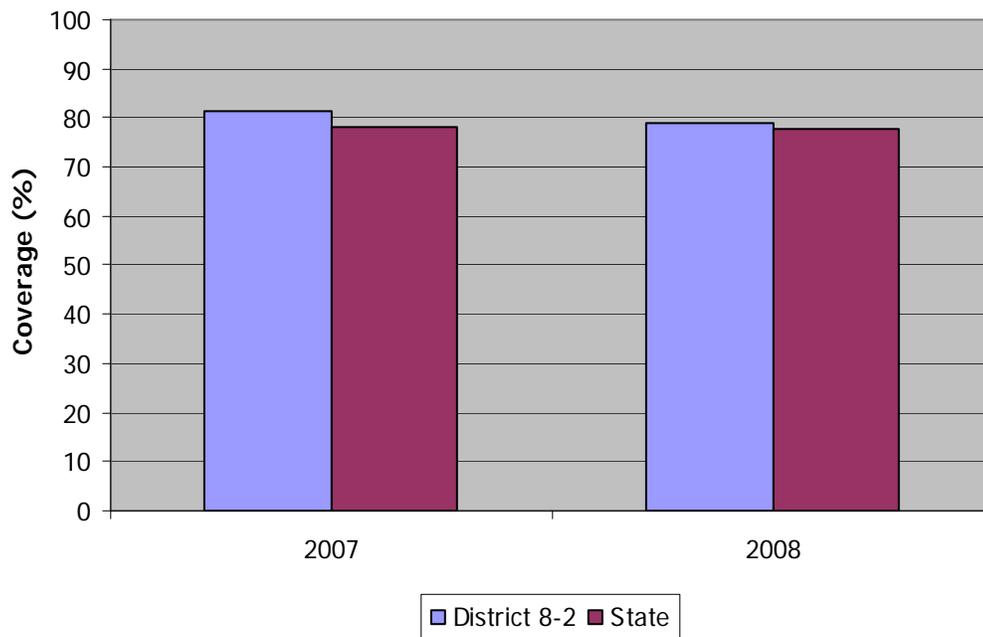
*Percent = number immunized / sample size
Sample size = 116

Individual Health District Report: District 8-2

The eligible sample from this district included 141 children born in January 2006. From the 141 children, 139 records were located (Response Rate=98.6%). Of the 139 located records, there were 2 parental refusals leaving a final sample of 137 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate rate is 78.8% (108/137).** This rate is 1.3% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 18: Coverage for State and District 8-2
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate rate is 77.4% (106/137).** This rate is 0.1% lower than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

Table 44:
District Immunization Rates for
Health District 8-2 by Study Year

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	94.9%	87.1%	77.2%	83.0%	88.3%
3 OPV/IPV	97.7%	91.9%	85.8%	89.7%	93.4%
1 MMR	97.7%	93.5%	87.4%	90.9%	94.2%
3 Hib	98.3%	93.5%	91.3%	90.3%	85.4%
3 HepB	97.7%	98.4%	89.8%	93.9%	97.1%
1 Varicella	97.7%	93.5%	85.0%	90.3%	93.4%
3 PCV	38.9%	85.5%	81.1%	90.9%	89.8%
4 PCV	8.0%	27.4%	62.2%	70.9%	67.9%

Table 44 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 67.9% to 97.1% for the 2008 study data.

Table 45 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 45:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	136	99.3%
DTP2/DTaP2	134	97.8%
DTP3/DTaP3	121	88.3%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	136	99.3%
OPV/IPV2	133	97.1%
OPV/IPV3	90	65.7%
OPV/IPV4	0	0.0%
MMR1	3	2.2%
MMR2	0	0.0%
HIB1	133	97.1%
HIB2	127	92.7%
HIB3	42	30.7%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	137	100.0%
HEPB2	136	99.3%
HEPB3	108	78.8%
HEPB4	2	1.5%
VAR1	3	2.2%
VAR2	0	0.0%
PCV1	129	94.2%
PCV2	126	92.0%
PCV3	100	73.0%
PCV4	2	1.5%
PCV5	0	0.0%

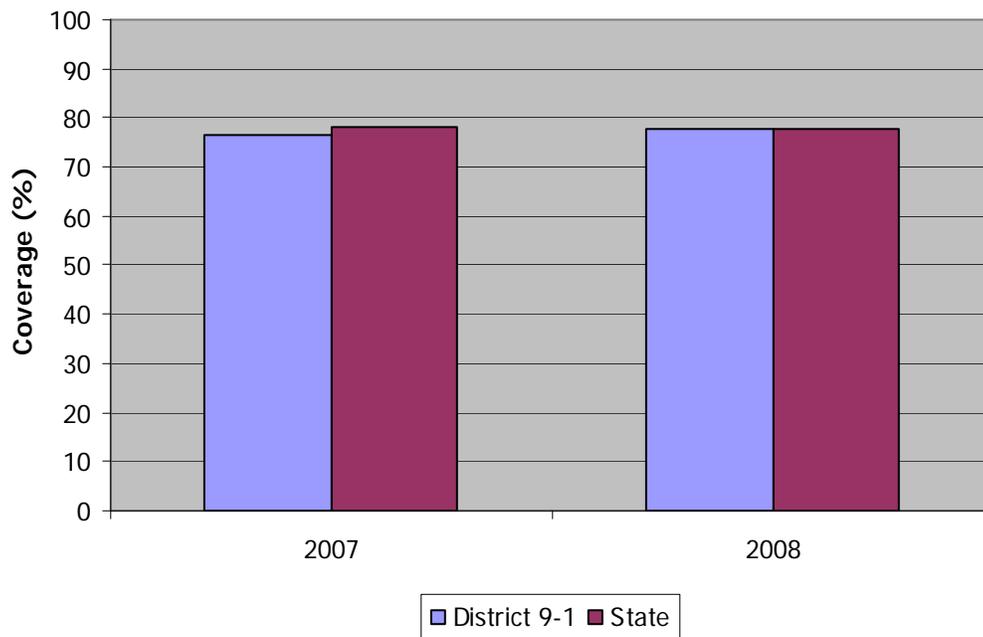
*Percent = number immunized / sample size
Sample size = 137

Individual Health District Report: District 9-1

The eligible sample from this district included 115 children born in January 2006. From the 115 children, 112 records were located (Response Rate=97.4%). Of the 112 located records, there were no parental refusals leaving a final sample of 112 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 77.7% (87/112).** This rate is 0.1% lower than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 19: Coverage for State and District 9-1
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 77.7% (87/112).** This rate is 0.3% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 46:
District Immunization Rates for
Health District 9-1 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	97.5%	87.0%	85.1%	82.9%	83.9%
3 OPV/IPV	98.8%	94.4%	93.5%	90.0%	92.9%
1 MMR	98.8%	92.6%	91.1%	90.7%	86.6%
3 Hib	98.8%	94.4%	93.5%	88.6%	91.1%
3 HepB	100%	96.3%	92.9%	89.3%	92.9%
1 Varicella	98.8%	94.4%	92.9%	88.6%	89.3%
3 PCV	53.1%	75.9%	82.7%	85.7%	86.6%
4 PCV	17.3%	33.3%	61.9%	73.6%	75.9%

Table 46 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 75.9% to 92.9% for the 2008 study data.

Table 47 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 47:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	107	95.5%
DTP2/DTaP2	104	92.9%
DTP3/DTaP3	93	83.0%
DTP4/DTaP4	1	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	107	95.5%
OPV/IPV2	104	92.9%
OPV/IPV3	71	63.4%
OPV/IPV4	0	0.0%
MMR1	3	2.7%
MMR2	0	0.0%
HIB1	107	95.5%
HIB2	104	92.9%
HIB3	39	34.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	108	96.4%
HEPB2	105	93.8%
HEPB3	62	55.4%
HEPB4	6	5.4%
VAR1	3	2.7%
VAR2	0	0.0%
PCV1	101	90.2%
PCV2	97	86.6%
PCV3	81	72.3%
PCV4	4	3.6%
PCV5	0	0.0%

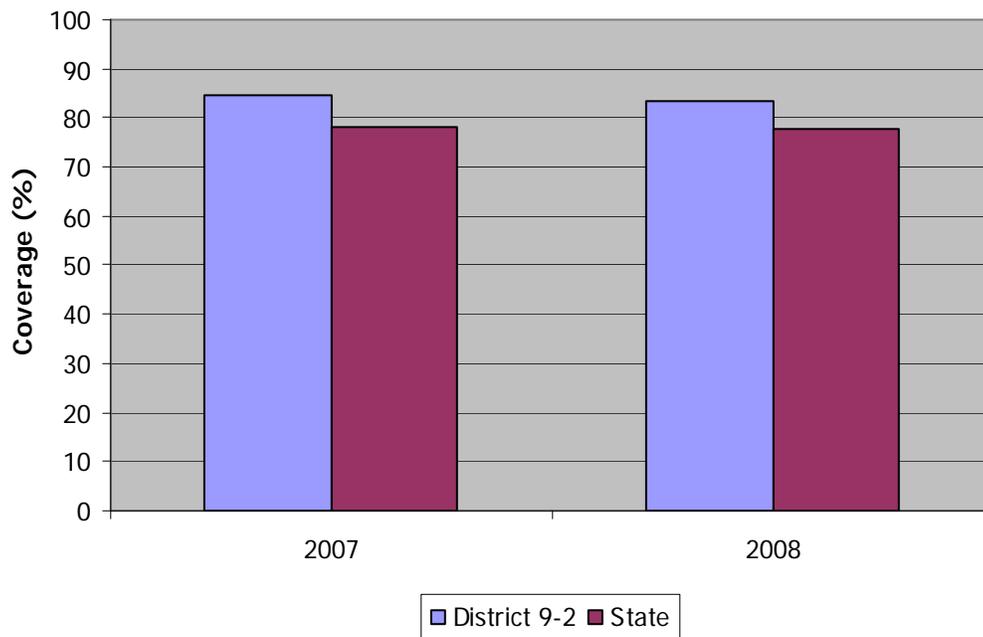
*Percent = number immunized / sample size
Sample size = 112

Individual Health District Report: District 9-2

The eligible sample from this district included 166 children born in January 2006. From the 166 children, 164 records were located (Response Rate=98.8%). Of the 164 located records, there were no parental refusals leaving a final sample of 164 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 83.5% (137/164).** This rate is 7.3% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 20: Coverage for State and District 9-2
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 83.5% (137/164).** This rate is 7.7% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 48:
District Immunization Rates for
Health District 9-2 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	83.0%	86.0%	83.7%	89.1%	89.0%
3 OPV/IPV	90.4%	93.3%	92.7%	93.0%	95.1%
1 MMR	89.6%	92.1%	86.2%	93.8%	93.9%
3 Hib	91.1%	91.5%	86.2%	91.5%	88.4%
3 HepB	90.4%	95.7%	90.2%	94.6%	97.0%
1 Varicella	90.4%	93.3%	87.8%	94.6%	94.5%
3 PCV	39.3%	79.3%	89.4%	92.2%	95.7%
4 PCV	5.2%	28.7%	54.5%	75.2%	85.4%

Table 48 reveals the coverage rates of each vaccine series. Coverage rates ranged from 85.4% to 97.0% for the 2008 study data.

Table 49 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 49:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	161	98.2%
DTP2/DTaP2	158	96.3%
DTP3/DTaP3	145	88.4%
DTP4/DTaP4	2	1.2%
DTP5/DTaP5	0	0.0%
OPV/IPV1	161	98.2%
OPV/IPV2	158	96.3%
OPV/IPV3	112	68.3%
OPV/IPV4	1	0.6%
MMR1	9	5.5%
MMR2	0	0.0%
HIB1	161	98.2%
HIB2	155	94.5%
HIB3	34	20.7%
HIB4	2	1.2%
HIB5	1	0.6%
HEPB1	163	99.4%
HEPB2	161	98.2%
HEPB3	138	84.1%
HEPB4	68	41.5%
VAR1	10	6.1%
VAR2	0	0.0%
PCV1	159	97.0%
PCV2	154	93.9%
PCV3	138	84.1%
PCV4	5	3.0%
PCV5	0	0.0%

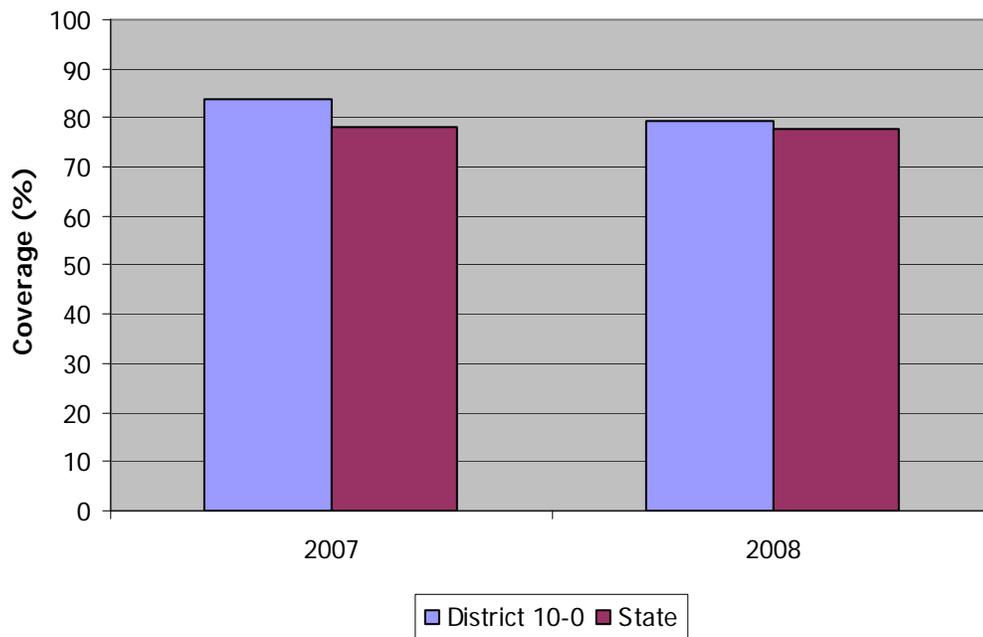
*Percent = number immunized / sample size
Sample size = 164

Individual Health District Report: District 10-0

The eligible sample from this district included 135 children born in January 2006. From the 135 children, 130 records were located (Response Rate=96.3%). Of the 130 located records, there were no parental refusals leaving a final sample of 130 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 79.2% (103/130).** This rate is 1.8% higher than the statewide 4:3:1:3:3:1 immunization rate of 77.8%.

**Figure 21: Coverage for State and District 10-0
2007 & 2008 - 4:3:1:3:3:1-level**



- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 80.8% (105/130).** This rate is 4.3% higher than the statewide 4:3:1:3:3:1:3 immunization rate of 77.5%.

**Table 50:
District Immunization Rates for
Health District 10-0 by Study Year**

Vaccine	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates	2008 Adequate Rates
4 DTP/DTaP	94.3%	93.5%	94.4%	87.5%	86.2%
3 OPV/IPV	98.9%	98.4%	94.4%	91.3%	90.8%
1 MMR	97.7%	98.4%	94.4%	92.3%	90.0%
3 Hib	95.5%	98.4%	97.2%	89.4%	88.5%
3 HepB	94.3%	98.4%	94.4%	92.3%	91.5%
1 Varicella	94.3%	98.4%	93.1%	93.3%	90.0%
3 PCV	60.2%	91.9%	90.3%	91.3%	92.3%
4 PCV	25.0%	35.5%	61.1%	76.0%	84.6%

Table 50 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 84.6% to 92.3% for the 2008 study data.

Table 51 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

**Table 51:
2008 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 10-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	128	98.5%
DTP2/DTaP2	126	96.9%
DTP3/DTaP3	117	90.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	128	98.5%
OPV/IPV2	125	96.2%
OPV/IPV3	80	61.5%
OPV/IPV4	0	0.0%
MMR1	5	3.8%
MMR2	0	0.0%
HIB1	127	97.7%
HIB2	124	95.4%
HIB3	45	34.6%
HIB4	1	0.8%
HIB5	0	0.0%
HEPB1	128	98.5%
HEPB2	125	96.2%
HEPB3	60	46.2%
HEPB4	1	0.8%
VAR1	10	7.7%
VAR2	0	0.0%
PCV1	128	98.5%
PCV2	126	96.9%
PCV3	115	88.5%
PCV4	4	3.1%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 130

In addition to the individual comparisons between the state rate and each district rate, the districts were examined together and ranked by highest to lowest levels of 4:3:1:3:3:1 coverage. These comparisons were made to illustrate which districts are adequately immunizing the most children and also which districts show the most room for improvement.

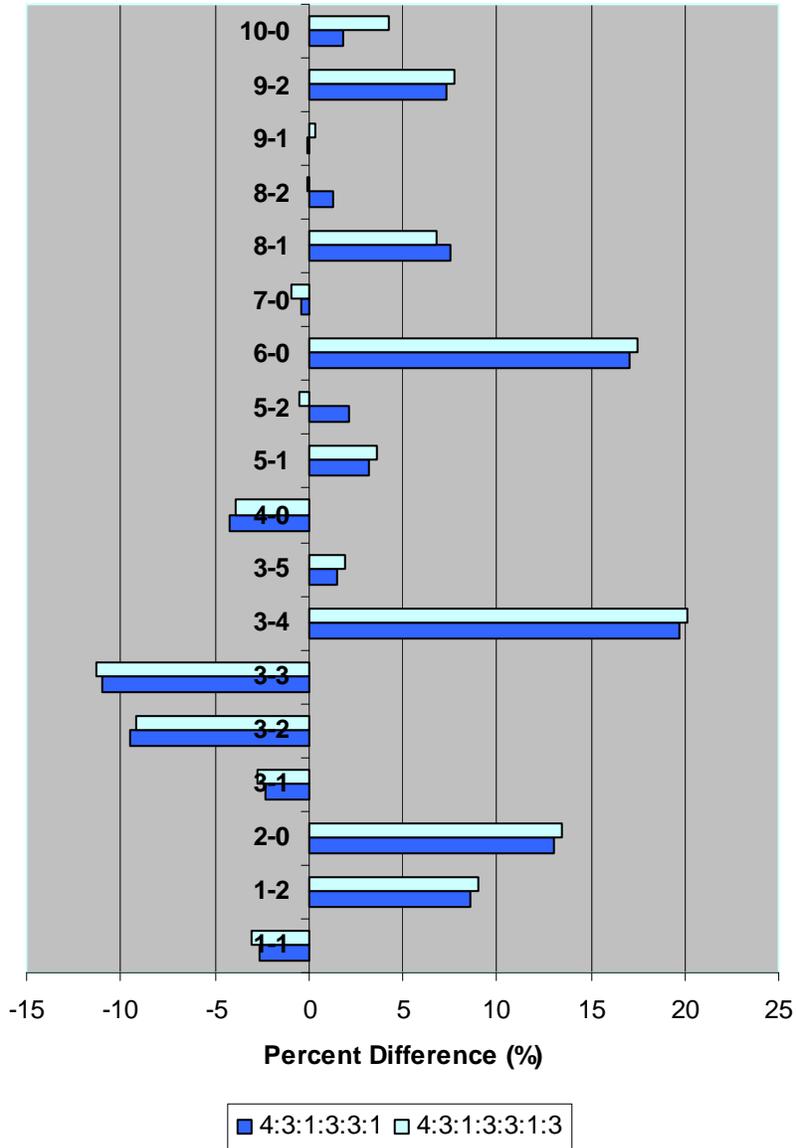
Table 52:
2008 District 4:3:1:3:3:1 Immunization Rates
Ranked from Highest to Lowest and
Percent Difference from State Average

	Health Districts (Ranked from highest 4:3:1:3:3:1 coverage to lowest)	4:3:1:3:3:1 Coverage (%)	Difference in 4:3:1:3:3:1 Coverage from State (%)
1	3-4; East Metro (Lawrenceville)	93.1	19.7
2	6-0; East Central (Augusta)	91.1	17.1
3	2-0; North (Gainesville)	88.0	13.0
4	1-2; North Georgia (Dalton)	84.5	8.6
5	8-1; South (Valdosta)	83.6	7.5
6	9-2; Southeast (Waycross)	83.5	7.3
7	5-1; South Central (Dublin)	80.3	3.2
8	5-2; North Central (Macon)	79.4	2.1
9	10-0; Northeast (Athens)	79.2	1.6
10	3-5; DeKalb	79.0	1.5
11	8-2; Southwest (Albany)	78.8	1.3
12	9-1; Coastal (Savannah)	77.7	-0.1
13	7-0; West Central (Columbus)	77.5	-0.4
14	3-1; Cobb-Douglas	76.0	-2.3
15	1-1; Northwest (Rome)	75.8	-2.6
16	4-0; LaGrange	74.5	-4.2
17	3-2; Fulton	70.4	-9.5
18	3-3; Clayton (Jonesboro)	69.2	-11
	State	77.8	0

For this comparison, each district was evaluated by the percent deviation of the 4:3:1:3:3:1-level coverage from the state's average rate of 77.8%. The East-Metro (Lawrenceville) district showed the highest coverage of 93.1%, which is 19.7 percent higher than the state average. The Clayton (Jonesboro) district showed the lowest coverage rate at 69.2%, 11 percent lower than the state average.

Figure 22 offers a graphical representation of the district-level coverage rates in relation to the state averages.

Figure 22: Percent Difference in Coverage Rates from State by District 2008



Section V: Discussion

Section V: Discussion

Summary

The purpose of the twelfth year of the Georgia Immunization Study (GIS) was to assess the statewide and district-specific immunization coverage rates of two-year-old children who received immunizations from both public and private providers in Georgia in 2008. To assess these rates, the study drew an original sample of 2,557 children born in January 2006. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 2,475. Of these, 2,369 records were located and make up the final sample.

The twelfth year of the GIS, 2008, measured immunization coverage for children born in 2006 at three levels:*

- 4:3:1:3:3:1:3 coverage, defined as 4 DTaP, 3 OPV/IPV, 1 MMR, 3 Hib, 3 Hep B, 1 Varicella and 3 PCV
- 4:3:1:3:3:1 coverage, defined as 4 DTaP, 3 OPV/IPV, 1 MMR, 3 Hib, 3 Hep B and 1 Varicella

Of these two coverage levels, 4:3:1:3:3:1:3 rates were generally the lower but close to the 4:3:1:3:3:1 rates. The 4:3:1:3:3:1 measure was used most frequently throughout the study. The 4:3:1:3:3:1 measure of coverage was added in 1997-98. Therefore, 4:3:1:3:3:1 rates can be compared using study data from the 1997-98 on.

The 2008 results reflect immunization rates for children born in 2006. The results of the study indicate that, of the 2,369 children whose immunization records were located during data collection:

*It must be remembered that the 2008 study is estimating 2006 rates. The 2007 study is estimating 2005 rates, 2006 study estimated 2004 rates, 2005 study estimated 2003 rates and the 2004 study estimated rates for 2002.

- 77.8% of children born in January of 2006 in Georgia were adequately immunized with the 4:3:1:3:3:1 vaccine series.
- 77.5% of children born in January of 2006 in Georgia were adequately immunized with the 4:3:1:3:3:1:3 vaccine series.

The study investigated where the immunizations are being administered in Georgia (See Appendix E). In the twelfth study year, 80.6% of the shots found were given by private providers.

Furthermore, the findings may serve to guide future immunization assessments, as well as to highlight areas for additional research.

Conclusions

Immunization rates for the 4:3:1:3:3:1 vaccine series decreased by less than 1% in the 2008 study (78.0% to 77.8%). The 2008 Georgia Immunization Study measured Varicella rates for the eleventh year. From one perspective, the rates represent a success for the Georgia Immunization Program and the Health Districts. Measurement of rates for a new vaccine series has to begin at some time. The collection of data on 4:3:1:3:3:1 rates from the first point at which these rates became available (i.e. the 1997-98 Georgia Immunization Study) will allow public health staff to examine trends and monitor rates.

In reviewing the 4:3:1:3:3:1 vaccine series, rates appeared stable statewide from the 2005 study (76.5%) to the 2006 study (76.8%), increasing slightly in the 2007 study (78.0%) and remaining close to that rate in 2008 (77.8%), as mentioned above.

The results of the previous four years of the study (2004, 2005, 2006 and 2007) show that immunization-specific coverage rates for the state have remained relatively similar.

Strengths

1. This study represents Georgia's twelfth successful statewide, population-based assessment of immunization coverage rates. Dr. Joan Herold, Demographer/Survey Specialist at Emory University, originally developed the sampling methodology for the study. The sample sizes fulfill the power and accuracy requirements for the data analyses.
2. The stratification of the sample by health district, allows for the calculation of district level immunization rates.
3. The methodology allowed for analysis of these useful data:
 - Determination of where the shots are given, either public or private provider. (See Appendix E: Provider of Immunizations). Former immunization audits in Georgia have looked at rates of public providers alone.
 - Assessment of immunization status based on the most recent recommended 4:3:1:3:3:1:3 vaccine series.
 - Comparison of rates for children born in 2004, 2005, 2006, 2007 and 2008 in Georgia.
4. As a measure of reliability for the data entry process, double data entry was conducted on 10% of all records entered. The data entry error rate is approximately 3% for the 2008 study.
5. The implementation of the Georgia Registry of Immunizations and Transaction Services (GRITS) has assisted with locating immunization records. The response rate for 2008 was 96.8%, which is 3.4% increase from the 2007 study's response rate.

Limitations

The following describe important limitations of the study that should be considered when interpreting study results.

1. There were three limitations related to sampling. First, although the study included a random sample of children born in January 2006 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 2006, it could not account for variations that may routinely occur in other months of the year. Second, limiting the sample to children born in one month does not form the basis of a surveillance system capable of detecting changes in the health care system. Third, there may be children in the eligible sample who were erroneously included in the eligible sample and listed as not located. Examples of this type of error would be cases where a child died, was adopted, or was part of a military family, but the child's ineligibility related to these circumstances never became known to the public health representatives because the child could not be found. Although public health representatives were trained to follow the same protocol, each worked independently with limited supervision and may have deviated from the stated protocol in order to obtain all of the information.
2. Each year of the study parents in the Metro Atlanta District more often refused to participate (District 3-2 and 3-5). Response rates also tend to be lower in the Metro area (Districts 3-2, 3-3, 3-4 and 3-5).

APPENDIX A:

**DESCRIPTION OF SAMPLING PLAN
AND STATISTICAL NOTE**

APPENDIX A: DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

The target population for this study was children born in the state of Georgia in 2006 who were residing in the state in 2008. Children who were born in Georgia to mothers who were not Georgia residents were excluded, since Georgia was not responsible for the health care of these children. Children born on military bases were excluded because they fall under their own health care system and their immunization records were not obtainable. Those who died or moved out of state before their second birthday were also excluded because Georgia was no longer responsible for their immunization status. Adopted children were excluded because they were untraceable.

The sampling frame for the study was all infants born in January 2006 in the state of Georgia who were born to Georgia residents, not in military hospitals, and who survived until their first birthday. This choice of sampling frame assumes no seasonality in birth coverage or exposure to immunizations in the state in 2006. From this sampling frame, independent random samples of birth certificate data were drawn for each health district in Georgia, in accordance with the required sample sizes. At the time of sample selection, children born in military hospitals and children known to have died within the first year of life were eliminated from the sampling frame. However, it was impossible to eliminate from the sampling frame children born to military families who were not born in a military hospital, children who were adopted, and children who died after the first year of life, or who moved out of state during 2008. Thus, these exclusions were made after sample selection. It can be assumed that the elimination of these records after sample selection did not have a significant effect on the random nature of the sampling because of the very small percentage they represented of the total population.

For a description of sample sizes, see Table 53: Data Used for Sample Size Estimates for the 2008 Study. Response rates and immunization coverage levels from the 2007 study were used in the sample size calculation for the 2008 study. The sample sizes were adjusted for small population size. The desired

sample size was then increased by a factor equivalent to the non-response rate (non-locatable immunization records) for each district from the 2007 study. The final calculated sample size is shown in the last column (Column H) of Table 53. This is the number of birth records statewide and per health district used as a result of this calculation for the study.

At the end of the study, response rates (located immunization records) varied from a low of 91.9% to a high of 100.0%, with the average response rate for the state at 96.8%. The state level data are based on a sample stratified by health district, with differing probabilities of selection. Therefore, the district data were weighted in order to provide more accurate, weighted estimates for the state level coverage rates.

**Table 53:
Data Used for 2008 Study Sample Size Estimates**

A	B	C	D	E	F	G	H
Health District	Jan 2006 Total Births	Jan 2006 Eligible Births	2007 4:3:1 Immunization Rates	2008 First Sample Estimate	2008 Second Sample Estimate	Return Rate based on 2007 Eligible Sample	2008 Adjusted Sample Size
1-1	745	729	0.846	200	157	0.924	170
1-2	546	535	0.955	66	59	0.978	60
2-0	717	705	0.976	36	34	0.999	50
3-1	1,059	1,033	0.819	228	187	0.958	195
3-2	1,076	1,051	0.625	360	268	0.944	284
3-3	443	434	0.737	298	177	0.817	216
3-4	1,358	1,327	0.951	72	68	0.943	72
3-5	929	904	0.833	214	173	0.922	188
4-0	861	843	0.822	225	177	0.922	193
5-1	160	154	0.924	108	63	0.985	64
5-2	613	593	0.859	186	142	0.942	150
6-0	567	554	0.979	32	30	0.999	50
7-0	438	384	0.79	255	153	0.938	163
8-1	344	334	0.874	169	112	0.913	123
8-2	453	443	0.83	217	146	0.976	149
9-1	674	616	0.821	226	165	0.959	172
9-2	435	424	0.891	149	110	0.917	120
10-0	498	485	0.865	179	131	0.946	138
State	11,916	11,548	0.819	228	223	0.935	2,559

Figure 23:
Explanations of Table 52
Data Used for Sample Size Estimates
For the 2008 Study

<u>Column A:</u>	Health District	District number.
<u>Column B:</u>	January 2007 Total Births	Source: DHR Vital Records Office.
<u>Column C:</u>	January 2007 Eligible Births	
<u>Column D:</u>	2007 4:3:1 Immunization Rates	Source: Georgia Birth Cohort Follow-up Study (2005).
<u>Column E:</u>	First Sample Estimate - 2008 Study	Formula Used: $3.8416 \times (D) (1 - D) / .0025$
<u>Column F:</u>	Second Sample Estimate - 2008 Study	Adjustment for small size district populations. Formula Used: $E / (1 + E/C)$.
<u>Column G:</u>	Estimated Return Rate (Based on 2007 Study)	Given. Source: Georgia Birth Cohort Follow-up Study (2005).
<u>Column H:</u>	Adjusted Sample Size - 2008 Study	Formula Used: $(\text{Column F}) / (\text{Column G})$

APPENDIX B:

**LIST OF 2008 PUBLIC HEALTH REPRESENTATIVES
FOR THE
GEORGIA IMMUNIZATION STUDY**

**APPENDIX B: LIST OF 2008 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA
IMMUNIZATION STUDY**

<u>Health District</u>	<u>Public Health Representative</u>
1-1	Marie Smith, B.S.N.
1-2	Marian Babb, R.N. Ann Vossen, R.N.
2-0	Sandy Moore, LPN Janie Dalton, R.N.
3-1	Karen Thomas, R.N., B.S.N. Sylvia Frausto
3-2	Georgia Goseer, R.N. Jessica Harris
3-3	Freda Sheppard, L.P.N.
3-4	Brenda Crowe Gloria Melvin
3-5	Joyce Hess, R.N.
4-0	Darlene Sheets Deborah Cox, L.P.N. Amy Fenn, RN
5-1	Donna Forth, R.N. Kelly Knight
5-2	Sherry Cook
6-0	Melba McNorrill, R.N. Clois Witt, R.N., B.S.N.
7-0	Beverly Roberson, R.N., B.S.N.
8-1	Debra Adams
8-2	Sue Dale
9-1	Marianne Pappas, R.N. Cathy Schmid, R.N. Joanne Burnsed, B.S.N Mary Fleming Kim Carter Mona Smith Kathleen Knight, RN. Michelle Eitel Carol Lightsey Kathy Rowell Cindy Grovenstein Annie Washington, R.N. Debbie Melton, R.N. Karen Mikell, R.N.
9-2	Diane Watson Betty Miller Jessie Jones, L.P.N. Doris Wilbon, B.S., M.A. Virginia Bellamy, B.S.N. Kimberly Brown, B.S.N. Pat Thomas, R.N. Hollard Phillips, M.S., M.P.H.
10-0	Dionne Hansey

APPENDIX C:
DATA COLLECTION FORM



GEORGIA IMMUNIZATION STUDY 2008: TWO YEAR-OLD ASSESSMENT

A Collaboration between Georgia DHR, Division of Public Health and the Health Districts

Part A: Identifying Information

Tracking Information	Updated Information
Code: District: County:	Infant's Name:
Infant LName: Mname: Infant FName:	Parent/Guardian's Name:
Gender: DOB	New Address:
Address:	
City: State: GA Zip:	
Mother's Last Name: First:	New Phone Number(s): ()
Father's Last Name: First:	

Part B: Immunization History

VACCINES	DATE #1	DATE #2	DATE #3	DATE #4	DATE #5
DTP/DTaP (4)	mm dd yr / /				
Administered by:	HD MD UNK				
OPV/IPV (3)	mm dd yr / /				
Administered by:	HD MD UNK				
MMR (1)	mm dd yr / /				
Administered by:	HD MD UNK				
Hib (3)	mm dd yr / /				
Administered by:	HD MD UNK				
HEP-B (3)	mm dd yr / /				
Administered by:	HD Hosp./ MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
Varicella (1)	mm dd year / /				
Administered by: or Hx	HD MD UNK				
PCV (4) (Pneumococcal Conjugate)	mm dd year / /				
Administered by:	HD MD UNK				

Part C: Data Collection

<p>A. Health Department/GRITS</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. No record of the child (go to B) 8. GRITS (completed or partial immunization record) 9. Incomplete Immunizations (go to B) <p>B. Parent</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. Parent refused to give shot record or participate (END) 4. Parent moved to another health district <u>Write new address in the updated information above</u> (Send to state) 5. Parent not found (go to C) 6. Parent failed to respond (go to C) 9. Incomplete immunizations (go to C) 	<p>C. Physician</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. Physician refused (go to E) – contact state office as well 4. Physician not found (go to E) 5. Record not found (go to E) 6. Physician not known (go to E) 9. Incomplete immunizations (go to E) <p>D. Reason Ineligible</p> <ol style="list-style-type: none"> 1. Child died (END) 2. Parent in military (END) 3. Parent moved out of state (END) 4. Child adopted (END) 	
<p>Approved Abbreviations</p> <p>HD = Health Department MD = Physician Hosp. = Hospital Hx = History of Varicella Disease, <u>record the date.</u></p>	<p>E. Incomplete Immunization Due to:</p> <ol style="list-style-type: none"> 1. Religious reasons (END) 2. Medical reasons (END) 3. Other – Please Specify _____ (END) 4. Unable to locate (END) 	
Print Name of Public Health Rep. who completed form:	Date completed	Signature of Public Health Rep. who completed form:

APPENDIX D:
VARICELLA VACCINE AND
CHICKEN POX DATA

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 54 presents information on the Varicella vaccine as well as information on chicken pox. The results of this study have considered a child immunized for Varicella if the vaccine was administered anytime before or during the data collection period.

The table below demonstrates the utilization of the Varicella vaccine results in two ways. The first column describes the Varicella results had the two-year cut off been applicable. The second column depicts the Varicella results without the two-year restriction. The Varicella vaccination rates that report vaccination within the first two years of a child's life are lower than the Varicella vaccination rates that report vaccination at any point in time during the data collection period. These rates have not been adjusted for children who had natural Varicella immunity due to the chicken pox.

The final column describes the frequency of cases of chicken pox by district. A child's chicken pox status was provided by health department records, parents, or physicians. The % column is equal to the number of children who had chicken pox divided by the district's final sample size.

**Table 54:
2008 Varicella Rates and
Cases of Chicken Pox by District**

Health District	Varicella shot by age 2		Varicella shot anytime (by end of data collection)		Had chicken pox at anytime (by end of data collection)	
	Number	%	Number	%	Number	%
1-1	138	87.9	148	94.3	0	0.0
1-2	51	87.9	52	89.7	0	0.0
2-0	47	94.0	48	96.0	0	0.0
3-1	154	86.0	161	89.9	0	0.0
3-2	213	79.8	223	83.5	0	0.0
3-3	160	80.8	164	82.8	0	0.0
3-4	68	94.4	68	94.4	0	0.0
3-5	136	86.6	139	88.5	0	0.0
4-0	155	84.2	159	86.4	0	0.0
5-1	55	90.2	57	93.4	0	0.0
5-2	116	88.5	123	93.9	0	0.0
6-0	41	91.1	44	97.8	0	0.0
7-0	133	88.1	138	91.4	0	0.0
8-1	102	87.9	111	95.7	0	0.0
8-2	120	87.6	128	93.4	0	0.0
9-1	94	83.9	100	89.3	0	0.0
9-2	151	92.1	155	94.5	0	0.0
10-0	113	86.9	117	90.0	2	1.5
Statewide	2,047	86.4	2,135	90.1	2	0.08

Figure 24: 2008 State Varicella Vaccine Coverage Rates and Percentage of Sample With Disease

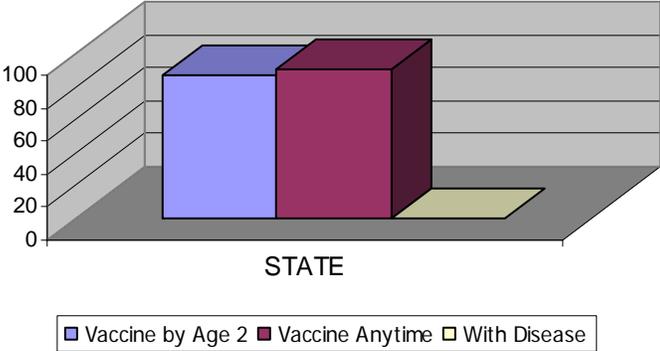


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two-year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

Table 58:
Margins of Error for 2008
Statewide and District 4:3:1:3:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1:3:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	157	75.8	+/- 6.7	69.1 – 82.5
1-2	58	84.5	+/- 9.3	75.2 – 93.8
2-0	50	88.0	+/- 9.0	79.0 – 97.0
3-1	179	76.0	+/- 6.3	69.7 – 82.3
3-2	267	70.4	+/- 5.5	64.9 – 75.9
3-3	198	69.2	+/- 6.4	62.8 – 75.6
3-4	72	93.1	+/- 5.9	87.2 – 99.0
3-5	157	79.0	+/- 6.4	72.6 – 85.4
4-0	184	74.5	+/- 6.3	68.2 – 80.8
5-1	61	80.3	+/- 10.0	70.3 – 90.3
5-2	131	79.4	+/- 6.9	72.5 – 86.3
6-0	45	91.1	+/- 8.3	82.8 – 99.4
7-0	151	77.5	+/- 6.7	70.8 – 84.2
8-1	116	83.6	+/- 6.7	76.9 – 90.3
8-2	137	78.8	+/- 6.8	72.0 – 85.6
9-1	112	77.7	+/- 7.7	70.0 – 85.4
9-2	164	83.5	+/- 5.7	77.8 – 89.2
10-0	130	79.2	+/- 7.0	72.2 – 86.2
Statewide Rate (weighted)	2,369	77.8	+/- 1.7	76.1 – 79.5

Appendix E:
Provider of Immunizations

Appendix E: Provider of Immunizations

Information about the provider of the immunizations was collected by noting where the shots were given (Public Health, Private Health, or Both) and who provided the information (Health Department, Private Provider, or Parent). If there was no indication of who gave the individual shot, the location for that shot was classified as unknown. The total number and percentage of shots given at each of the provider categories is shown in Table 55.

Table 55:
Statewide Percentage of Shots by Provider: 2004, 2005, 2006, 2007, and 2008

Provider	2004		2005		2006		2007		2008	
	Total #	%								
Public Health Dept	5,449	14.3	6,013	13.2	4,793	11.6	4,307	9.8	5,014	11.6
Private Physician	26,734	70.1	35,065	77.1	33,268	80.5	35,518	81.2	35,022	80.6
Unknown	5,966	15.6	4,407	9.7	3,256	7.9	3,916	9.0	3,395	7.8
Total	38,149	100.0	45,485	100.0	41,317	100.0	43,741	100.0	43,431	100.0

As shown in Table 55, in 2008, over 80% of the shots recorded for the sampled children were administered by a private provider.

Location of Immunizations by District

Table 56 illustrates the distribution of immunizations among public and private providers for each health district. These data were generated by counting the total number of shots given in each health district by provider location.

Table 56:
District Specific Percentage of Shots by Provider 2008

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	%	# Shots Given	%	# Shots Given	%	
1-1	160	5.4	2,749	92.5	64	2.2	2,973
1-2	116	11.2	899	86.4	25	2.4	1,040
2-0	7	0.8	889	97.2	19	2.1	915
3-1	215	6.6	2,031	62.4	1,007	31.0	3,253
3-2	68	1.5	4,361	96.4	95	2.1	4,524
3-3	347	10.3	2,683	79.6	340	10.1	3,370
3-4	0	0.0	1,360	98.6	19	1.4	1,379
3-5	226	8.7	1,780	68.2	604	23.1	2,610
4-0	470	14.7	2,672	83.8	47	1.5	3,189
5-1	179	15.4	749	64.3	236	20.3	1,164
5-2	178	7.4	2,171	90.5	50	2.1	2,399
6-0	145	16.2	736	82.1	15	1.7	896
7-0	316	11.6	2,388	87.7	19	0.7	2,723
8-1	356	16.4	1,678	77.3	138	6.4	2,172
8-2	370	14.9	1,622	65.5	484	19.5	2,476
9-1	209	10.5	1,686	84.6	97	4.9	1,992
9-2	857	27.3	2,184	69.6	95	3.0	3,136
10-0	83	3.5	2,281	96.3	5	0.2	2,369
State	4,302	10.1	34,919	82.0	3,359	7.9	42,580

In Year Ten:

- ❖ In seventeen health districts more than 50% of the shots were administered in the Private sector.

Results by region:

- ❖ **North (Districts 1-1, 1-2, 2-0, and 10-0)**

In all of these districts private physicians gave the majority of the immunizations.

- ❖ **Metro Atlanta (Districts 3-1, 3-2, 3-3, 3-4, and 3-5)**

In most of the metro-Atlanta area more of the immunizations were administered in the private sector rather than in the public sector. District 3-1, Cobb County, had a high number of unknown shot locations (31.0%).

- ❖ **Central (Districts 4-0, 5-1, 5-2, 6-0, 7-0)**

Children in all of the central districts received the majority of their shots at a private provider.

- ❖ **South (Districts 8-1, 8-2, 9-1, 9-2, 9-3)**

Private providers provided the majority of vaccinations in all health districts. District 9-2 also had a significant proportion of their shots given in the public sector (27.3%).

Four Year Comparison of Provider Information

The following table shows a comparison of results from the current year and the three previous years of the study. The comparisons reflect a movement of immunization services into the private sector in Georgia.

Table 57:
Location of Immunizations by District
Four Year Comparison
2005, 2006, 2007, and 2008

District	Public Health Department				Private Physician			
	2005	2006	2007	2008	2005	2006	2007	2008
1-1	9.8	6.3	9.9	5.4	82.3	84.9	87.5	92.5
1-2	4.1	5.6	9.0	11.2	92.7	92.8	83.6	86.4
2-0	6.5	15.2	9.8	0.8	82.8	84.8	89.4	97.2
3-1	13.1	5.9	9.0	6.6	22.5	46.4	44.5	62.4
3-2	8.3	6.8	3.6	1.5	87.3	87.2	93.9	96.4
3-3	8.7	10.9	7.6	10.3	75.9	78.2	73.9	79.6
3-4	4.4	2.2	4.1	0.0	94.2	97.8	95.9	98.6
3-5	21.4	10.5	3.0	8.7	75.1	87.2	92.9	68.2
4-0	15.0	18.5	10.2	14.7	80.2	80.5	82.5	83.8
5-1	13.8	16.9	13.6	15.4	79.1	83.1	73.4	64.3
5-2	15.4	15.7	16.6	7.4	70.2	76.3	76.4	90.5
6-0	8.2	11.0	11.1	16.2	89.0	87.2	86.6	82.1
7-0	11.7	5.4	14.4	11.6	86.7	94.6	83.4	87.7
8-1	13.7	7.9	15.1	16.4	86.3	92.1	84.9	77.3
8-2	26.4	3.2	2.7	14.9	73.6	96.8	95.1	65.5
9-1	14.6	14.7	14.2	10.5	85.4	80.1	79.4	84.6
9-2	30.2	49.2	31.4	27.3	65.9	47.9	60.1	69.6
9-3	8.7	---	---	3.5	89.3	---	---	96.3
10-0	20.7	7.1	10.0	5.4	78.0	92.9	89.7	92.5
State Totals	13.2	11.6	9.8	10.1	77.1	80.5	81.2	82.0

Four-Year Comparison: Summary of Table 57:

In 2005	13.2% of the shots were received at the public health department 77.1% of the shots were given in the private sector 9.7% of the shot locations were unknown
In 2006	11.6% of the shots were received at the public health department 80.5% of the shots were given in the private sector 7.9% of the shot locations were unknown
In 2007	9.8% of the shots were received at the public health department 81.2% of the shots were given in the private sector 9.0% of the shot locations were unknown
In 2008	10.1% of the shots were received at the public health department 82.0% of the shots were given in the private sector 7.9% of the shot locations were unknown

APPENDIX F:

**MARGINS OF ERROR FOR
IMMUNIZATION COVERAGE RATES**

APPENDIX F: MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

Margins of error were calculated for the 4:3:1:3:3:1 rate. This margin of error can be found in Tables 114. The formula used to calculate this margin of error in this table is:

Margin of error = square root of: $\frac{(3.8416)(\text{imm rate})(1 - \text{imm rate})}{\text{Final sample size}}$

Confidence intervals can be calculated using the margins of error. The constant 3.8416 is the chi-square value representing an error probability of less than 5%. Using the above formula for margin of error yields a 95% confidence interval for immunization rates. The interpretation of the 95% confidence interval for the state 4:3:1:3:3:1 immunization rate is as follows:

- ❖ With 95% confidence, the true statewide 4:3:1:3:3:1 immunization rate for infants born in 2006 is between 76.1% and 79.5%.

Due to the extensive analyses conducted for this report and the large number of rates reported, margins of error for specific rates were only calculated for the following:

- ❖ Statewide 4:3:1:3:3:1 immunization coverage rates

These margins of error and confidence intervals are noted in this appendix.

Table 58:
Margins of Error for 2008
Statewide and District 4:3:1:3:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1:3:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	157	75.8	+/- 6.7	69.1 – 82.5
1-2	58	84.5	+/- 9.3	75.2 – 93.8
2-0	50	88.0	+/- 9.0	79.0 – 97.0
3-1	179	76.0	+/- 6.3	69.7 – 82.3
3-2	267	70.4	+/- 5.5	64.9 – 75.9
3-3	198	69.2	+/- 6.4	62.8 – 75.6
3-4	72	93.1	+/- 5.9	87.2 – 99.0
3-5	157	79.0	+/- 6.4	72.6 – 85.4
4-0	184	74.5	+/- 6.3	68.2 – 80.8
5-1	61	80.3	+/- 10.0	70.3 – 90.3
5-2	131	79.4	+/- 6.9	72.5 – 86.3
6-0	45	91.1	+/- 8.3	82.8 – 99.4
7-0	151	77.5	+/- 6.7	70.8 – 84.2
8-1	116	83.6	+/- 6.7	76.9 – 90.3
8-2	137	78.8	+/- 6.8	72.0 – 85.6
9-1	112	77.7	+/- 7.7	70.0 – 85.4
9-2	164	83.5	+/- 5.7	77.8 – 89.2
10-0	130	79.2	+/- 7.0	72.2 – 86.2
Statewide Rate (weighted)	2,369	77.8	+/- 1.7	76.1 – 79.5