

GEORGIA IMMUNIZATION STUDY

2007 Final Report



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



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Acknowledgments

The Georgia Department of Human Resources, Division of Public Health, Epidemiology Section and the Immunization Program would like to thank the public health representatives that participated in this study for all of their hard work, support and dedication. This study could not have been completed successfully without the cooperation of health district staff throughout Georgia.

A profound thank you and sincere appreciation is also given to the private and non-public health providers and the Vaccines for Children providers that participated in this collaborative effort. Their cooperation and assistance throughout the study is greatly appreciated.

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.

A special note of thanks to Mrs. Michelle Conner, Georgia Immunization Program Director, for her support and leadership during this study.

2007 Executive Summary

The 2007 Immunization Study was conducted by the Georgia Department of Human Resources, 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 2007. Identifying information about the children and their parents was obtained from birth certificates.

The Immunization Study found that during 2007 most childhood immunizations (81.2%) were administered in the private sector, while County Health Departments immunized 9.8%, and the sources for 9% 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, but increased slightly to 78% during the 2007 study.

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 2007, 94% of infants had received two doses of hepatitis B vaccine by 12 months of age, and, at 24 months, 90% of children had received the recommended three doses.

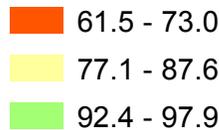
Vaccines have largely controlled diphtheria, measles, pertussis, and other scourges of the past. In 1923, with a population of less than three million, Georgia recorded 274 deaths from diphtheria, 347 deaths from measles, and 254 deaths from pertussis, while in 2003, just 80 years later, and with a population that has almost tripled, Georgia had no reported cases of tetanus or diphtheria, and just 36 cases of pertussis. In 2007, 86% of children 12 months of age were appropriately immunized against diphtheria, tetanus and pertussis, and 78% 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 59% in the Fulton district to 98% in the East Central (Augusta) district. Six of the state's public health districts (Dalton, Gainesville, Gwinnett, Augusta, Valdosta, and Waycross) 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 59% in Fulton to

93% in Gwinnett. In Georgia outside Metropolitan Atlanta, the immunization rates ranged from 76% in Macon and Columbus to 98% in the Augusta district (see Maps below).

Georgia Vaccination Rates (4:3:1:3) by Public Health District 2007

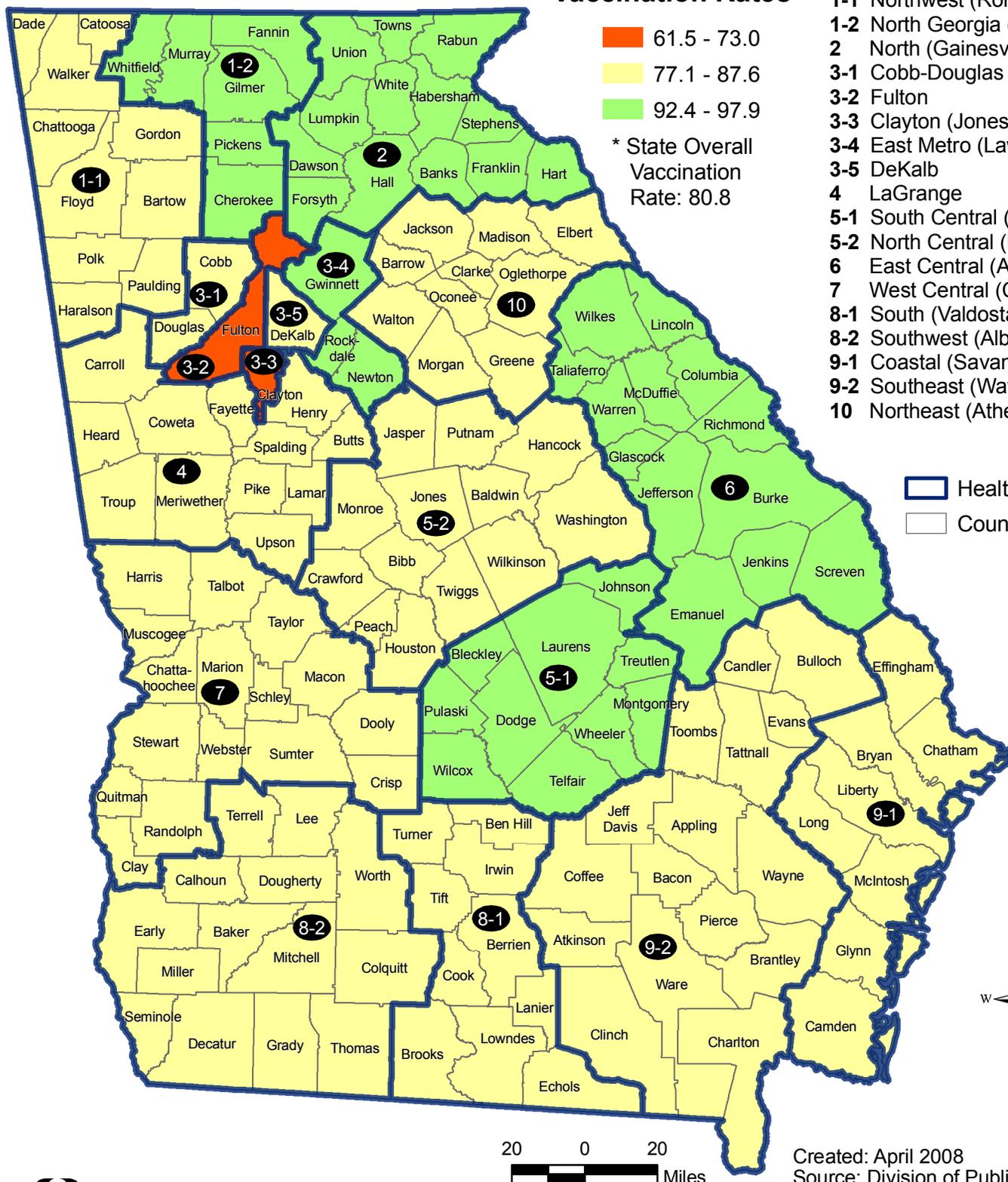
Vaccination Rates *



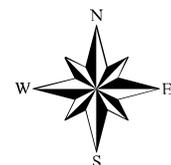
* State Overall
Vaccination
Rate: 80.8

PUBLIC HEALTH DISTRICTS

- 1-1 Northwest (Rome)
- 1-2 North Georgia (Dalton)
- 2 North (Gainesville)
- 3-1 Cobb-Douglas
- 3-2 Fulton
- 3-3 Clayton (Jonesboro)
- 3-4 East Metro (Lawrenceville)
- 3-5 DeKalb
- 4 LaGrange
- 5-1 South Central (Dublin)
- 5-2 North Central (Macon)
- 6 East Central (Augusta)
- 7 West Central (Columbus)
- 8-1 South (Valdosta)
- 8-2 Southwest (Albany)
- 9-1 Coastal (Savannah)
- 9-2 Southeast (Waycross)
- 10 Northeast (Athens)



Health Districts
 Counties



20 0 20
Miles

Created: April 2008
 Source: Division of Public Health
 Classification: Natural Breaks
 Projection: Georgia Statewide
 Lambert Conformal Conic
 Note: Map originally printed in color

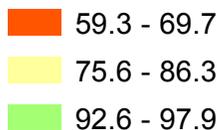


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Georgia Vaccination Rates (4:3:1:3:3:1) by Public Health District

2007

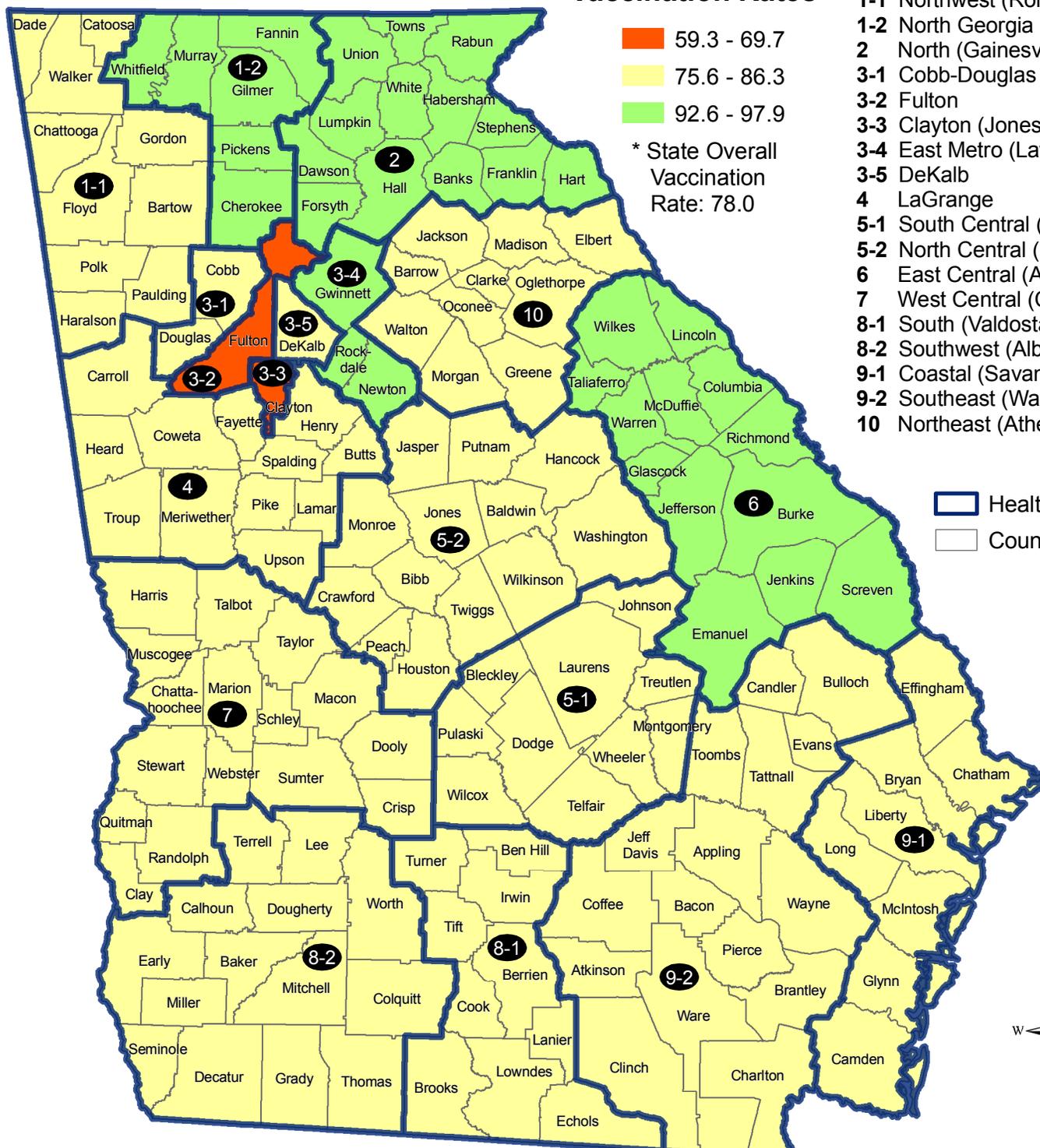
Vaccination Rates *



* State Overall Vaccination Rate: 78.0

PUBLIC HEALTH DISTRICTS

- 1-1 Northwest (Rome)
- 1-2 North Georgia (Dalton)
- 2 North (Gainesville)
- 3-1 Cobb-Douglas
- 3-2 Fulton
- 3-3 Clayton (Jonesboro)
- 3-4 East Metro (Lawrenceville)
- 3-5 DeKalb
- 4 LaGrange
- 5-1 South Central (Dublin)
- 5-2 North Central (Macon)
- 6 East Central (Augusta)
- 7 West Central (Columbus)
- 8-1 South (Valdosta)
- 8-2 Southwest (Albany)
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Health Districts
 Counties



Created: April 2008
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 Division of Public Health
 Health Planning & Assessment Unit

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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 2007 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 eleventh 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 eight years. Immunization data for each year of the study evaluate rates for children born two years before the beginning of the study. In 2007, immunization rates for children born in January 2005 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 Principal Investigator and Project Coordinator was Carol A. Hoban, MS, MPH, the Assistant Project Coordinator was La Tonya Thomas, MBA-HCM, and the Project Assistant was Mrs. Katherine Kahn.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in November 2006. During December 2006, 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 2007.

* Throughout this report, we refer to study years one, two, three, four, and five as, 2003, 2004, 2005, 2006 and 2007 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 2007 through September 2007. 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, 2006
Initial notification of public health community Immunization Coordinators Health Directors	December, 2006
Initial notification of private health community	January, 2007
Conference call training for public health representatives	January, 2007
Data collection period	February – September, 2007
Data entry period	March – December, 2007
Double data entry of 5% of data forms	December, 2007
Final data cleaning and analysis of data	January-February, 2008
Final Report	April, 2008

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 eleventh 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 2005. 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 2007. Identifying information about the children and their parents was obtained from birth certificates.

Target and Sample Populations

The target population of the eleventh year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 2005. A sample size of 2,742 children born in the month of January 2005 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 2005. 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 2007. 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 further 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 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 Ms. Hoban.

Data Entry

The principal investigator and project assistant 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 December 2007. Five 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

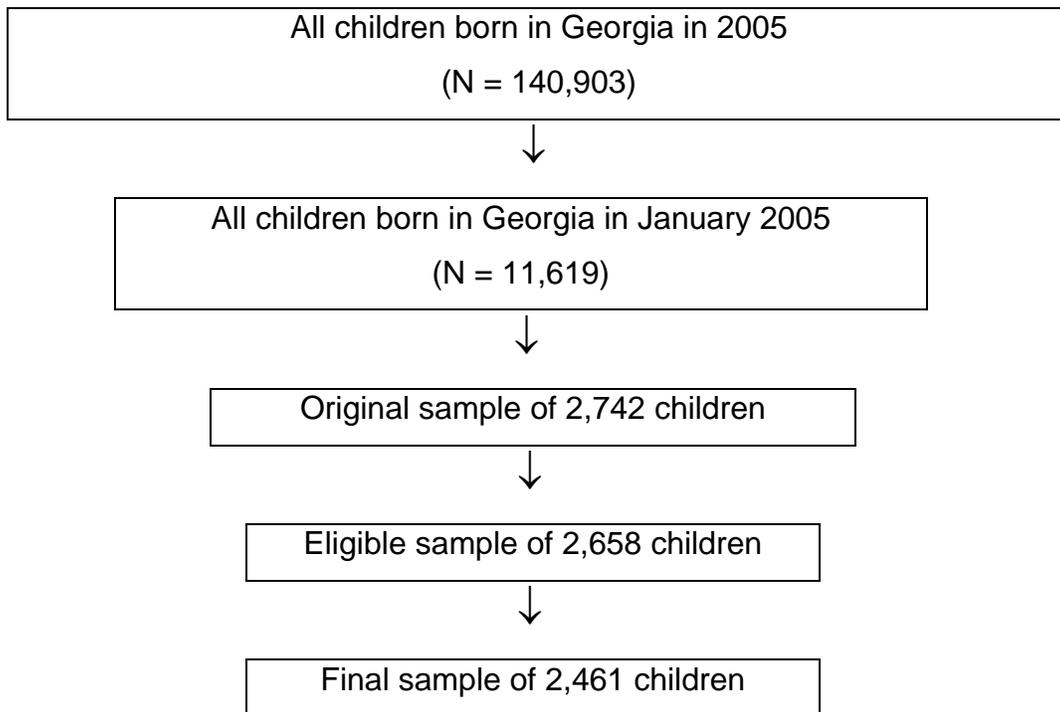
SECTION III: RESULTS OF STATEWIDE ANALYSES

Sampling

A sample of 2,742 children was drawn from 11,619 children born in Georgia in January 2005. A total of 140,903 children were born in Georgia during 2005.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 2,658. 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 2,658 children in the eligible sample, 2,461 children were located, 170 children never were located and 27 parental refusals were removed. The resulting final sample consisted of 2,461 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 2,461 children represented over 92% of the eligible sample.

Table 2:
Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	2,742	100.0%
Deceased	8	0.3%
Adopted	4	0.1%
Moved out of state	56	2.0%
Military	16	0.6%
Eligible Sample	2,658	97.0%
Eligible Sample	2,658	100.0%
Records Not Located /Eligibility Unknown *	197	7.4%
Final Sample (Located Records**)	2,461	92.6%

* **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=58] 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 2007 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 - using the eligible sample as the total. In reviewing the response rates based on the eligible sample, the district response rates range from a low of 81.7% to a high of 100%, with a statewide average response rate of 93.5%.

Table 3:

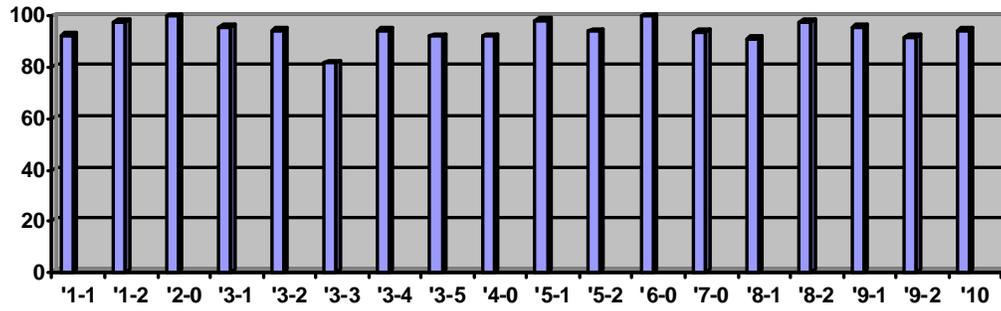
2007 Eligible Sample, Number Located and Response Rates by District

Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	197	182	92.4%
1-2	46	45	97.8%
2-0	87	87	100.0%
3-1	236	226	95.8%
3-2	342	323	94.4%
3-3	186	152	81.7%
3-4	87	82	94.3%
3-5	243	224	92.2%
4-0	245	226	92.2%
5-1	68	67	98.5%
5-2	86	81	94.2%
6-0	47	47	100.0%
7-0	112	105	93.8%
8-1	104	95	91.3%
8-2	169	165	97.6%
9-1	147	141	95.9%
9-2	145	133	91.7%
10-0	111	105	94.6%
State	2,658	2,486	93.5%

*sample includes parental refusals

**number located / eligible sample

Figure 2
2007 Response Rates by District



Georgia Health Districts

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 2007 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	182	0	0.00
1-2	45	1	0.02
2-0	87	3	0.03
3-1	226	0	0.00
3-2	323	6	0.02
3-3	152	0	0.00
3-4	82	1	0.01
3-5	224	3	0.01
4-0	226	1	0.00
5-1	67	1	0.01
5-2	81	3	0.04
6-0	47	0	0.00
7-0	105	0	0.00
8-1	95	0	0.00
8-2	165	0	0.00
9-1	141	1	0.01
9-2	133	5	0.04
10-0	105	2	0.02
Total	2,486	27	0.01

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 2,461 children (children located). 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 several 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
- ❖ "4:3:1:3" status a child has received four DTP/DaTP, three OPV/IPV, one MMR, and three Hib vaccinations

Table 5 illustrates the% 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 2,461 children who were located in 2007, 78% were adequately immunized at the 4:3:1:3:3:1 level. This% of adequately immunized children was similar to the 76.8% reported in 2006.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	%	Number	%
2003	1,906	74.3	661	25.7
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

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

Table 6 illustrates the% 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 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	%	Number	%
2005	2,095	79.5	539	20.5
2006	1,863	79.9	468	20.1
2007	1,988	80.8	473	19.2

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

Figure 3: Statewide Coverage
4:3:1:3 and 4:3:1:3:3:1

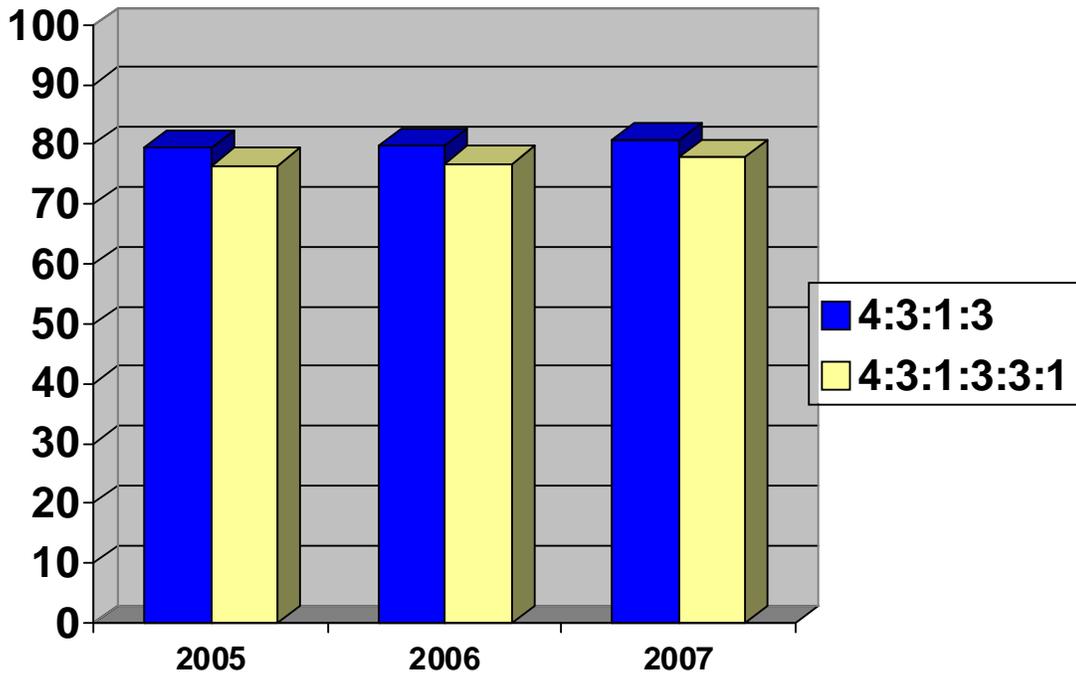


Figure 3 shows the statewide 4:3:1:3 coverage rates for the 2005, 2006 and 2007 studies. The figure also shows statewide 4:3:1:3:3:1 vaccination coverage for the 2005, 2006 and 2007 studies.

The statewide immunization status for each individual vaccine series is presented in Table 7. This table illustrates the number and% 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. During the 2003 assessment, nearly all vaccines were near the state goal of 90% coverage, with coverage for the 3 DTP/DtaP vaccine series over 90%. In 2004, all but one of the vaccine series met the coverage rate of 90%. Coverage levels for 2005 and 2006 have decreased slightly, but still show most of the vaccines are 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%. (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	2003		2004		2005		2006		2007	
	Number	%								
3 DTP/DTaP	2,340	91.2	2,459	93.0	2,428	92.2	2,147	92.1	2,261	91.9
4 DTP/DTaP	2,096	81.7	2,268	85.7	2,169	82.3	1,907	81.8	2,034	82.6
3 OPV/IPV	2,251	87.7	2,401	90.8	2,315	87.9	2,076	89.1	2,209	89.8
1 MMR	2,266	88.3	2,405	90.9	2,296	87.2	2,070	88.8	2,185	88.8
3 Hib	2,242	87.3	2,387	90.2	2,306	87.5	2,062	88.5	2,145	87.2
3 Hep B	2,255	87.8	2,400	90.7	2,337	88.7	2,081	89.3	2,223	90.3
1 Varicella	2,101	81.8	2,378	89.9	2,302	87.4	2,070	88.8	2,169	88.1
3 PCV	---	---	1,262	47.7	2,080	79.0	1,970	84.5	2,189	88.9
4 PCV	---	---	485	18.3	1,024	38.9	1,453	62.3	1,799	73.1

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

* PCV data not collected before 2004.

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 2003, 2004, 2005, 2006, and 2007 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 2003	Percent* 2003	Number 2004	Percent* 2004	Number 2005	Percent* 2005	Number 2006	Percent* 2006	Number 2007	Percent* 2007
DTP/DTaP1	2,447	95.3%	2,554	96.6%	2,545	96.6%	2,269	97.3%	2,349	95.4%
DTP/DTaP2	2,367	92.2%	2,472	93.5%	2,451	93.1%	2,193	94.1%	2,280	92.6%
DTP/DTaP3	2,176	84.8%	2,255	85.3%	2,253	85.5%	1,992	85.5%	2,117	86.0%
DTP/DTaP4	8	0.3%	26	1.0%	25	0.9%	9	0.4%	8	0.3%
DTP/DTaP5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
OPV/IPV1	2,442	95.1%	2,553	96.5%	2,541	96.5%	2,262	97.0%	2,357	95.8%
OPV/IPV2	2,350	91.5%	2,458	92.9%	2,433	92.4%	2,181	93.6%	2,286	92.9%
OPV/IPV3	1,004	39.1%	1,132	42.8%	1,275	48.4%	1,339	57.4%	1,542	62.7%
OPV/IPV4	3	0.1%	5	0.2%	9	0.3%	9	0.4%	4	0.2%
MMR1**	92	3.6%	110	4.2%	96	3.6%	24	1.0%	93	3.8%
MMR2	1	0.0%	0	0.0%	1	0.0%	0	0.0%	0	0.0%
HIB1	2,436	94.9%	2,541	96.1%	2,531	96.1%	2,262	97.0%	2,353	95.6%
HIB2	2,345	91.4%	2,446	92.5%	2,407	91.4%	2,156	92.5%	2,263	92.0%
HIB3	1,110	43.2%	1,063	40.2%	955	36.3%	789	33.8%	687	27.9%
HIB4	16	0.6%	25	0.9%	32	1.2%	9	0.4%	8	0.3%
HIB5	0	0.0%	0	0.0%	1	0.0%	0	0.0%	0	0.0%
HEPB1	2,440	95.1%	2,551	96.4%	2,549	96.8%	2,273	97.5%	2,368	96.2%
HEPB2	2,346	91.4%	2,478	93.7%	2,463	93.5%	2,199	94.3%	2,307	93.7%
HEPB3	1,264	49.2%	1,229	46.5%	1,342	50.9%	1,442	61.9%	1,593	64.7%
HEPB4	19	0.7%	26	1.0%	92	3.5%	193	8.3%	239	9.7%
VAR1**	125	4.9%	136	5.1%	115	4.4%	27	1.2%	97	3.9%
VAR2	1	0.0%	0	0.0%	1	0.0%	0	0.0%	0	0.0%
PCV1	---	---	---	---	2,359	89.6%	2,167	93.0%	2,314	94.0%
PCV2	---	---	---	---	2,209	83.9%	2,041	87.6%	2,223	90.3%
PCV3	---	---	---	---	1,796	68.2%	1,570	67.4%	1,984	80.6%
PCV4	---	---	---	---	25	2.1%	23	1.0%	59	2.4%

*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 Size for 2003 study = 2,567; 2004 study = 2,645; 2005 study = 2,634; 2006 study = 2,331; 2007 study = 2,461.

Tables 9-15 present the state and district rates for each individual vaccine during the 2003, 2004, 2005, 2006, and 2007 data collection periods.

As shown in Table 9, 2007 district immunization rates for the DTP/DTaP vaccines ranged from 63.1% to 97.9%, with a statewide rate of 82.6% receiving all four doses. The 2007 statewide DTP/DTaP rate is only slightly higher than the rate from the 2006 study year.

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

District	2003 Rates 4 DTP/DTaP	2004 Rates 4 DTP/DTaP	2005 Rates 4 DTP/DTaP	2006 Rates 4 DTP/DTaP	2007 Rates 4 DTP/DTaP
1-1	77.1%	85.3%	82.3%	82.2%	84.6%
1-2	86.3%	88.2%	97.8%	100.0%	95.5%
2-0	95.7%	100%	97.8%	92.6%	97.6%
3-1	76.6%	78.8%	79.0%	75.2%	83.6%
3-2	68.1%	78.8%	73.8%	68.6%	63.1%
3-3	79.1%	67.4%	58.6%	78.0%	75.0%
3-4	90.0%	94.1%	92.4%	94.9%	96.3%
3-5	66.0%	82.4%	74.0%	76.5%	84.2%
4-0	84.5%	79.1%	83.9%	75.0%	83.1%
5-1	93.3%	85.5%	94.7%	89.6%	93.9%
5-2	84.9%	87.1%	88.5%	94.7%	88.5%
6-0	87.8%	90.5%	94.8%	98.6%	97.9%
7-0	77.1%	88.4%	90.3%	90.0%	79.0%
8-1	91.9%	89.5%	94.3%	89.7%	87.4%
8-2	75.3%	94.9%	87.1%	77.2%	83.0%
9-1	77.3%	97.5%	87.0%	85.1%	82.9%
9-2	82.6%	83.0%	86.0%	83.7%	89.1%
9-3	83.0%	83.1%	82.6%	---	---
10-0	93.2%	94.3%	93.5%	94.4%	87.5%
State	81.7%	85.7%	82.3%	81.8%	82.6%

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

Table 10 shows the 2003, 2004, 2005, 2006, and 2007 state and district rates for the OPV/IPV vaccines. The 2007 district coverage rates for these vaccines varied between 72.6% and 100.0%. The 2007 statewide immunization rate for OPV/IPV was 89.8%, which is only slightly higher than the previous year's study rate.

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

District	2003 Rates 3 OPV/IPV	2004 Rates 3 OPV/IPV	2005 Rates 3 OPV/IPV	2006 Rates 3 OPV/IPV	2007 Rates 3 OPV/IPV
1-1	84.8%	89.9%	89.0%	91.4%	94.0%
1-2	88.9%	92.2%	98.5%	100.0%	97.7%
2-0	94.7%	100.0%	97.8%	96.3%	98.8%
3-1	83.4%	83.5%	86.2%	83.5%	90.7%
3-2	71.7%	85.0%	81.1%	80.9%	72.6%
3-3	85.8%	74.4%	68.4%	85.4%	90.1%
3-4	90.0%	96.1%	90.2%	97.4%	96.3%
3-5	82.0%	89.5%	83.1%	81.1%	88.2%
4-0	92.7%	85.6%	87.1%	88.6%	93.3%
5-1	97.8%	92.7%	96.0%	95.8%	97.0%
5-2	93.7%	93.2%	94.2%	96.9%	93.6%
6-0	91.9%	94.8%	97.4%	100.0%	100.0%
7-0	85.0%	93.5%	92.9%	96.0%	88.6%
8-1	96.0%	96.1%	97.7%	91.4%	95.8%
8-2	80.7%	97.7%	91.9%	85.8%	89.7%
9-1	88.7%	98.8%	94.4%	93.5%	90.0%
9-2	88.4%	90.4%	93.3%	92.7%	93.0%
9-3	89.4%	88.0%	88.7%	---	---
10-0	93.2%	98.9%	98.4%	94.4%	91.3%
State	87.7%	90.8%	87.9%	89.1%	89.8%

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

Table 11 shows the 2003, 2004, 2005, 2006, and 2007 state and district rates for MMR. The 2007 district rates for MMR ranged from a low of 72.2% to a high of 100.0%, with a statewide rate of 88.8% coverage. The 2007 statewide rate for the MMR vaccine remained at 88.8%.

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

District	2003 Rates 1 MMR	2004 Rates 1 MMR	2005 Rates 1 MMR	2006 Rates 1 MMR	2007 Rates 1 MMR
1-1	88.1%	91.3%	87.8%	92.0%	90.7%
1-2	90.8%	94.1%	97.8%	100.0%	97.7%
2-0	96.8%	100.0%	97.8%	92.6%	98.8%
3-1	80.7%	86.3%	82.1%	87.2%	88.5%
3-2	71.0%	82.7%	80.4%	81.6%	72.2%
3-3	85.1%	75.6%	65.6%	86.0%	82.9%
3-4	90.0%	96.1%	91.3%	95.7%	95.1%
3-5	80.7%	90.8%	84.8%	84.4%	90.0%
4-0	92.7%	85.0%	89.3%	83.2%	88.9%
5-1	97.8%	90.9%	96.0%	100.0%	98.5%
5-2	96.8%	93.2%	92.1%	95.4%	92.3%
6-0	91.9%	95.7%	94.8%	98.6%	100.0%
7-0	87.9%	93.0%	93.8%	95.0%	90.5%
8-1	95.2%	92.1%	97.7%	89.7%	94.7%
8-2	81.3%	97.7%	93.5%	87.4%	90.9%
9-1	90.0%	98.8%	92.6%	91.1%	90.7%
9-2	90.6%	89.6%	92.1%	86.2%	93.8%
9-3	89.4%	89.2%	87.0%	---	---
10-0	93.8%	97.7%	98.4%	94.4%	92.3%
State	88.3%	90.9%	87.2%	88.8%	88.8%

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

As shown in Table 12, 2007 district immunization rates for the Hib vaccine varied between 69.1% and 97.9%. The statewide Hib coverage rate in 2007 was 87.2%, a slight decrease from the 2006 statewide rate of 88.5%.

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

District	2003 Rates 3 Hib	2004 Rates 3 Hib	2005 Rates 3 Hib	2006 Rates 3 Hib	2007 Rates 3 Hib
1-1	84.1%	90.8%	87.2%	89.0%	91.2%
1-2	90.8%	94.1%	97.8%	100.0%	97.7%
2-0	93.6%	100.0%	95.7%	96.3%	96.4%
3-1	82.1%	82.1%	84.1%	87.2%	86.7%
3-2	72.5%	84.1%	81.4%	81.6%	69.1%
3-3	88.4%	76.7%	71.7%	86.0%	83.6%
3-4	90.0%	96.7%	92.4%	95.7%	95.1%
3-5	76.0%	88.3%	82.3%	84.4%	86.4%
4-0	87.3%	86.6%	88.8%	83.2%	89.8%
5-1	97.8%	87.3%	96.0%	93.8%	92.4%
5-2	91.3%	91.2%	90.6%	97.7%	87.2%
6-0	93.5%	92.2%	94.8%	98.6%	97.9%
7-0	85.7%	93.0%	91.2%	92.0%	86.7%
8-1	95.2%	94.7%	96.6%	93.1%	97.9%
8-2	81.3%	98.3%	93.5%	91.3%	90.3%
9-1	87.3%	98.8%	94.4%	93.5%	88.6%
9-2	86.2%	91.1%	91.5%	86.2%	91.5%
9-3	89.4%	84.3%	88.7%	---	---
10-0	95.7%	95.5%	98.4%	97.2%	89.4%
State	87.3%	90.2%	87.5%	88.5%	87.2%

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

Table 13 reports the statewide and district immunization coverage rates for the Hepatitis B vaccine. In 2007, the district coverage rates varied from a low of 72.6% to 100.0%. The 2007 statewide rate of 90.3% for the Hepatitis B vaccine was slightly greater than the 2006 statewide rate of 89.3%.

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

District	2003 Rates 3 Hep B	2004 Rates 3 Hep B	2005 Rates 3 Hep B	2006 Rates 3 Hep B	2007 Rates 3 Hep B
1-1	83.4%	90.8%	89.0%	92.0%	94.0%
1-2	90.8%	94.1%	98.5%	100.0%	97.7%
2-0	93.6%	98.5%	93.5%	96.3%	98.8%
3-1	86.2%	83.0%	83.6%	86.7%	90.7%
3-2	74.6%	85.4%	81.1%	78.0%	72.6%
3-3	88.8%	77.9%	75.0%	86.6%	91.4%
3-4	90.0%	96.7%	91.3%	95.7%	96.3%
3-5	78.0%	89.1%	82.3%	80.2%	89.1%
4-0	92.7%	86.1%	90.2%	89.7%	92.9%
5-1	96.7%	90.9%	96.0%	97.9%	93.9%
5-2	93.7%	91.8%	92.1%	96.9%	92.3%
6-0	95.1%	94.0%	95.7%	100.0%	100.0%
7-0	87.9%	93.5%	93.8%	97.0%	91.4%
8-1	96.0%	96.1%	97.7%	94.8%	97.9%
8-2	82.0%	97.7%	98.4%	89.8%	93.9%
9-1	79.3%	100.0%	96.3%	92.9%	89.3%
9-2	87.7%	90.4%	95.7%	90.2%	94.6%
9-3	86.2%	86.7%	90.4%	---	---
10-0	95.1%	94.3%	98.4%	94.4%	92.3%
State	87.8%	90.7%	88.7%	89.3%	90.3%

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 70.3% to 100.0%, with a statewide coverage rate of 88.1% for the Varicella vaccine. This is a slight decrease from the 2006 Varicella rate of 88.8%.

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

District	2003 Rates 1 Varicella	2004 Rates 1 Varicella	2005 Rates 1 Varicella	2006 Rates 1 Varicella	2007 Rates 1 Varicella
1-1	86.8%	89.0%	87.2%	92.0%	90.1%
1-2	90.2%	95.1%	97.8%	100.0%	97.7%
2-0	96.8%	98.5%	97.8%	92.6%	98.8%
3-1	80.7%	83.5%	82.6%	84.9%	86.7%
3-2	71.7%	81.4%	78.5%	81.2%	70.3%
3-3	84.7%	74.4%	67.2%	86.0%	82.9%
3-4	90.0%	94.1%	92.4%	95.7%	96.3%
3-5	74.0%	89.5%	85.7%	84.8%	89.1%
4-0	92.7%	85.0%	89.7%	83.7%	88.9%
5-1	95.6%	90.9%	97.3%	97.9%	97.0%
5-2	92.9%	91.2%	92.8%	96.9%	92.3%
6-0	90.2%	94.8%	93.9%	98.6%	100.0%
7-0	85.7%	93.5%	93.8%	96.0%	89.5%
8-1	94.4%	92.1%	96.6%	91.4%	94.7%
8-2	78.0%	97.7%	93.5%	85.0%	90.3%
9-1	83.3%	98.8%	94.4%	92.9%	88.6%
9-2	91.3%	90.4%	93.3%	87.8%	94.6%
9-3	86.2%	88.0%	87.8%	---	---
10-0	95.7%	94.3%	98.4%	93.1%	93.3%
State	86.7%	89.9%	87.4%	88.8%	88.1%

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 2007, the district coverage rates varied from a low of 73.2% to 96.4%.

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
1-1	81.1%	82.2%	92.3%
1-2	95.5%	100.0%	95.5%
2-0	95.7%	96.3%	96.4%
3-1	82.1%	87.6%	92.0%
3-2	79.8%	79.4%	73.2%
3-3	62.7%	78.7%	88.2%
3-4	90.2%	95.7%	95.1%
3-5	73.2%	77.8%	90.0%
4-0	78.1%	81.5%	89.8%
5-1	82.7%	87.5%	95.5%
5-2	69.1%	90.1%	91.0%
6-0	90.4%	97.3%	93.6%
7-0	67.3%	82.0%	89.5%
8-1	88.6%	87.9%	94.7%
8-2	85.5%	81.1%	90.9%
9-1	75.9%	82.7%	85.7%
9-2	79.3%	89.4%	92.2%
9-3	73.9%	---	---
10-0	91.9%	90.3%	91.3%
State	79.0%	84.5%	88.9%

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 at three levels: 4:3:1:3:3:1 coverage, 4:3:1:3 coverage, 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, immunization rates during the 2007 study year were slightly higher than the rates measured by this study during 2006.

SECTION IV:
RESULTS OF DISTRICT LEVEL
ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

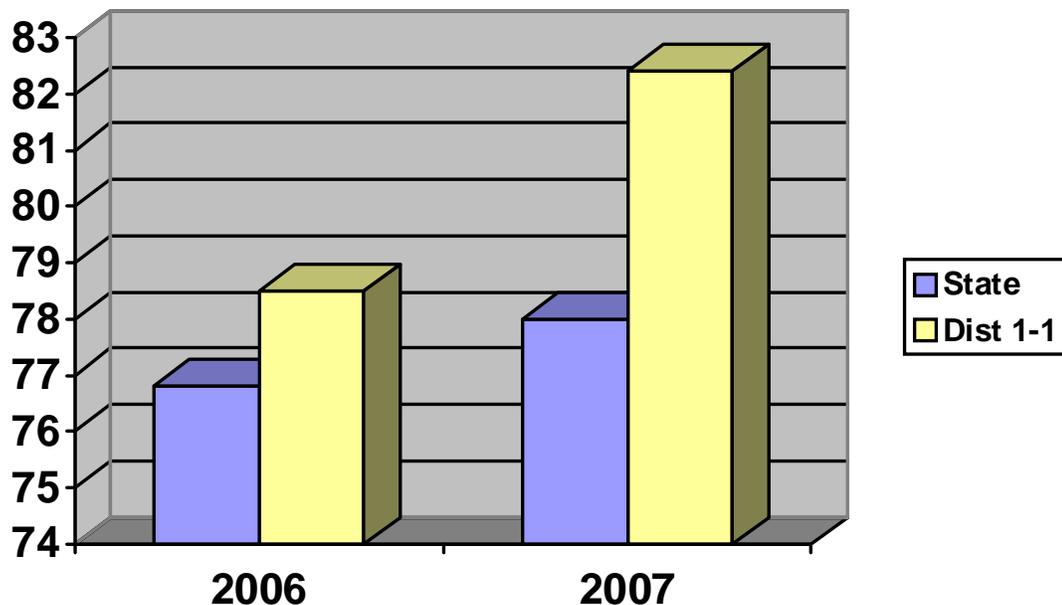
The immunization rates for this eighth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: 2007 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, 4:3:1:3 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 197 children born in January 2005. From the 197 children, 182 records were located (Response Rate=92.4%). Of the 182 located records, there were no parental refusals leaving a final sample of 182 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 82.4% (150/182).**
This rate is higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 4: 4:3:1:3:3:1 Coverage for State and District 1-1



- ❖ **The 4:3:1:3 immunization coverage estimate is 84.6% (154/182).**
This rate is also higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 80.8% (147/182).**
This rate is also higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	77.5%	85.3%	79.5%	82.2%	84.6%
3 OPV/IPV	84.8%	89.9%	88.8%	91.4%	94.0%
1 MMR	88.1%	91.3%	87.6%	92.0%	90.7%
3 Hib	84.1%	90.8%	87.0%	89.0%	91.2%
3 HepB	83.4%	90.8%	88.8%	92.0%	94.0%
1 Varicella	86.8%	89.0%	87.0%	92.0%	90.1%
3 PCV	---	51.4%	82.0%	82.2%	92.3%
4 PCV	---	15.6%	44.1%	69.9%	78.0%

*PCV data not collected before 2004.

Table 16 reveals the coverage rates of each vaccine series. Coverage rates ranged from 78.0 to 94.0% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	179	98.4%
DTP2/DTaP2	172	94.5%
DTP3/DTaP3	160	87.9%
DTP4/DTaP4	2	1.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	180	98.9%
OPV/IPV2	172	94.5%
OPV/IPV3	127	69.8%
OPV/IPV4	1	0.5%
MMR1	10	5.5%
MMR2	0	0.0%
HIB1	181	99.5%
HIB2	173	95.1%
HIB3	65	35.7%
HIB4	1	0.5%
HIB5	0	0.0%
HEPB1	181	99.5%
HEPB2	177	97.3%
HEPB3	151	83.0%
HEPB4	68	37.4%
VAR1	10	5.5%
VAR2	0	0.0%
PCV1	177	97.3%
PCV2	168	92.3%
PCV3	153	84.1%
PCV4	8	4.4%
PCV5	0	0.0%

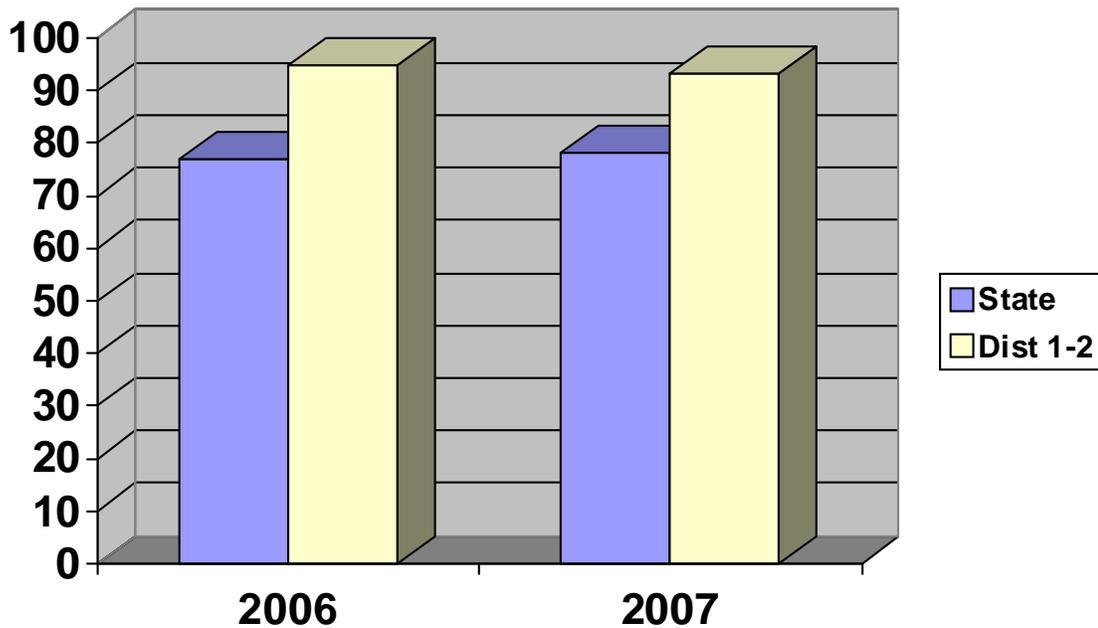
*Percent = number immunized / sample size
sample size = 182

Individual Health District Report: District 1-2

The eligible sample from this district included 46 children born in January 2005. From these children, 45 records were located (Response Rate=97.8%). Of the 45 located records, there was 1 parental refusal leaving a final sample of 44 records.

- ❖ **4:3:1:3:3:1 immunization coverage estimate 93.2% (41/44).** This rate is much higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 5: 4:3:1:3:3:1 Coverage for State and District 1-2



- ❖ **4:3:1:3 immunization coverage estimate 95.5% (42/44).** This rate is also much higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **4:3:1:3:3:1:3 immunization coverage estimate 93.2% (41/44).** This rate is also much higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	86.3%	88.2%	97.8%	100.0%	95.5%
3 OPV/IPV	88.9%	92.2%	98.5%	100.0%	97.7%
1 MMR	90.8%	94.1%	97.8%	100.0%	97.7%
3 Hib	90.8%	94.1%	97.8%	100.0%	97.7%
3 HepB	90.8%	94.1%	98.5%	100.0%	97.7%
1 Varicella	90.2%	95.1%	97.8%	100.0%	97.7%
3 PCV	---	56.9%	95.5%	100.0%	95.5%
4 PCV	---	14.7%	52.2%	81.1%	86.4%

*PCV data not collected before 2004.

Table 18 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 86.4% to 97.7% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 1-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	44	100.0%
DTP2/DTaP2	43	97.7%
DTP3/DTaP3	38	86.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	44	100.0%
OPV/IPV2	43	97.7%
OPV/IPV3	33	75.0%
OPV/IPV4	0	0.0%
MMR1	1	2.3%
MMR2	0	0.0%
HIB1	44	100.0%
HIB2	44	100.0%
HIB3	13	29.5%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	44	100.0%
HEPB2	43	97.7%
HEPB3	25	56.8%
HEPB4	4	9.1%
VAR1	1	2.3%
VAR2	0	0.0%
PCV1	43	97.7%
PCV2	42	95.5%
PCV3	35	79.5%
PCV4	0	0.0%
PCV5	0	0.0%

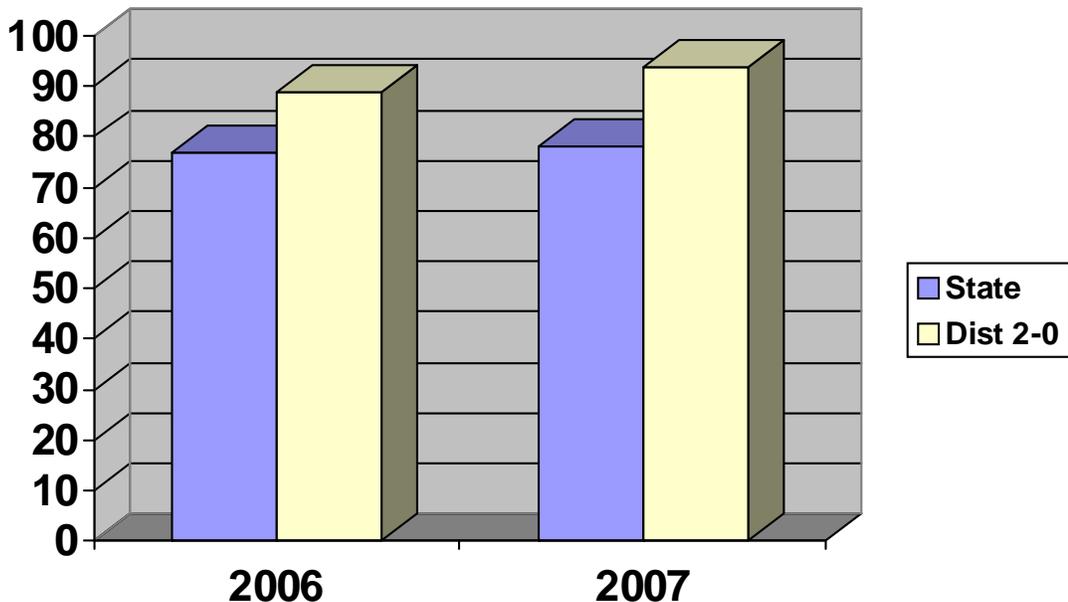
*Percent = number immunized / sample size
Sample size = 44

Individual Health District Report: District 2-0

The eligible sample from this district included 87 children born in January 2005. From the 87 children, 87 records were located (Response rate = 100%). Of the 87 located records, there were 3 parental refusals leaving a final sample of 84 records.

- ❖ **4:3:1:3:3:1 immunization coverage estimate is 94.0% (79/84).** This rate is much higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 6: 4:3:1:3:3:1 Coverage for State and District 2-0



- ❖ **4:3:1:3 immunization coverage estimate is 96.4% (81/84).** This rate is also much higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **4:3:1:3:3:1:3 immunization coverage estimate is 94.0% (79/84).** This rate is also much higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	95.7%	100%	97.8%	92.6%	97.6%
3 OPV/IPV	94.7%	100%	97.8%	96.3%	98.8%
1 MMR	96.8%	100%	97.8%	92.6%	98.8%
3 Hib	93.6%	100%	95.7%	96.3%	96.4%
3 HepB	93.6%	100%	93.5%	96.3%	98.8%
1 Varicella	96.8%	98.5%	97.8%	92.6%	98.8%
3 PCV	---	77.6%	95.7%	96.3%	96.4%
4 PCV	---	28.4%	65.2%	74.1%	89.3%

*PCV data not collected before 2004.

Table 20 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 89.3% to 98.8% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 2-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	83	98.8%
DTP2/DTaP2	82	97.6%
DTP3/DTaP3	81	96.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	83	98.8%
OPV/IPV2	82	97.6%
OPV/IPV3	40	47.6%
OPV/IPV4	0	0.0%
MMR1	2	2.4%
MMR2	0	0.0%
HIB1	83	98.8%
HIB2	80	95.2%
HIB3	27	32.1%
HIB4	1	1.2%
HIB5	0	0.0%
HEPB1	83	98.8%
HEPB2	83	98.8%
HEPB3	44	52.4%
HEPB4	6	7.1%
VAR1	2	2.4%
VAR2	0	0.0%
PCV1	81	96.4%
PCV2	79	94.0%
PCV3	77	91.7%
PCV4	0	0.0%
PCV5	0	0.0%

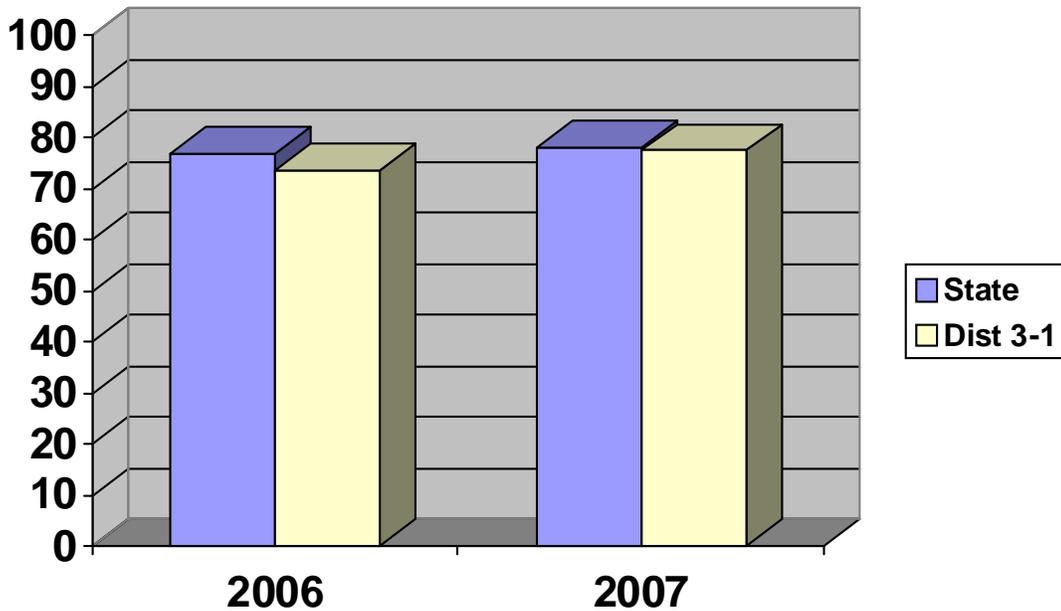
*Percent = number immunized / sample size
Sample size = 84

Individual Health District Report: District 3-1

The eligible sample from this district included 236 children born in January 2005. From the 236 children, 226 records were located (Response Rate=95.8%). Of the 226 located records, there were no parental refusals leaving a final sample of 226 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 77.4% (175/226).**
This rate is lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 7: 4:3:1:3:3:1 Coverage for State and District 3-1



- ❖ **The 4:3:1:3 immunization coverage estimate is 79.6% (180/226).** This rate is slightly lower than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 77.0% (174/226).** This rate is slightly higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	76.6%	78.8%	79.0%	75.2%	83.6%
3 OPV/IPV	83.4%	83.5%	86.2%	83.5%	90.7%
1 MMR	80.7%	86.3%	82.1%	87.2%	88.5%
3 Hib	82.1%	82.1%	84.1%	86.2%	86.7%
3 HepB	86.2%	83.0%	83.6%	86.7%	90.7%
1 Varicella	80.7%	83.5%	82.6%	84.9%	86.7%
3 PCV	---	46.7%	82.1%	87.6%	92.0%
4 PCV	---	23.1%	45.6%	68.8%	81.0%

*PCV data not collected before 2004.

Table 22 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 81.0% to 92.0% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-1**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	218	96.5%
DTP2/DTaP2	211	93.4%
DTP3/DTaP3	201	88.9%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	221	97.8%
OPV/IPV2	214	94.7%
OPV/IPV3	149	65.9%
OPV/IPV4	0	0.0%
MMR1	10	4.4%
MMR2	0	0.0%
HIB1	220	97.3%
HIB2	209	92.5%
HIB3	74	32.7%
HIB4	2	0.9%
HIB5	0	0.0%
HEPB1	224	99.1%
HEPB2	216	95.6%
HEPB3	160	70.8%
HEPB4	60	26.5%
VAR1	9	4.0%
VAR2	0	0.0%
PCV1	218	96.5%
PCV2	212	93.8%
PCV3	196	86.7%
PCV4	9	4.0%
PCV5	0	0.0%

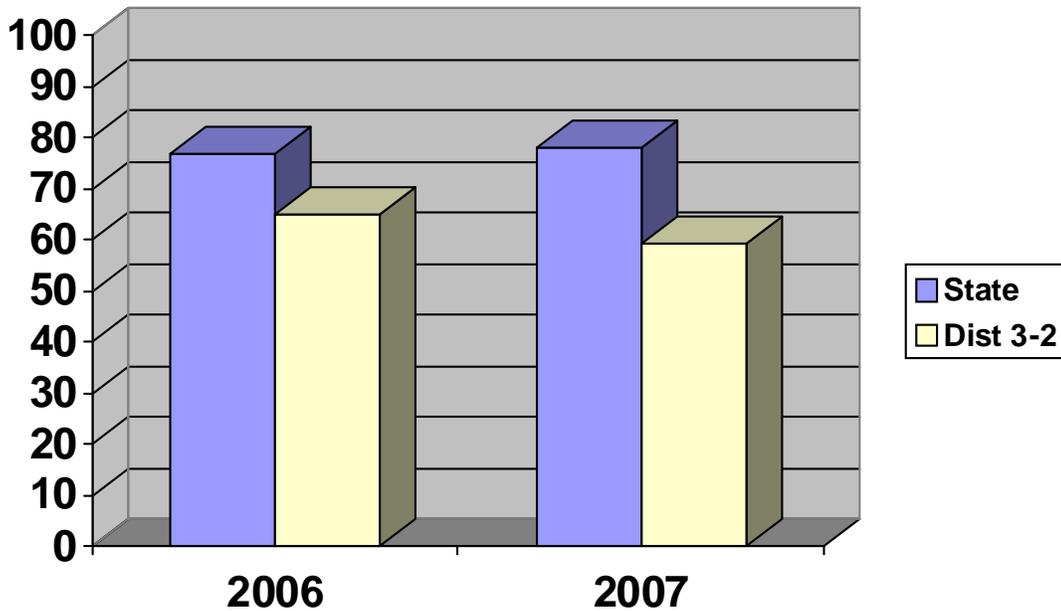
*Percent = number immunized / sample size
Sample size = 226

Individual Health District Report: District 3-2

The eligible sample from this district included 342 children born in January 2005. From the 342 children, 323 records were located (Response Rate=94.4%). Of the 323 located records, there were 6 parental refusals leaving a final sample of 317 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 59.3% (188/317).**
This rate is much lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 8: 4:3:1:3:3:1 Coverage for State and District 3-2



- ❖ **The 4:3:1:3 immunization coverage estimate is 61.5% (195/317).** This rate is also much lower than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 58.4% (185/317).** This rate is also much lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	68.1%	78.8%	73.8%	68.6%	63.1%
3 OPV/IPV	71.7%	85.0%	81.1%	80.9%	72.6%
1 MMR	71.0%	82.7%	80.4%	81.6%	72.2%
3 Hib	72.5%	84.1%	81.4%	80.9%	69.1%
3 HepB	74.6%	85.4%	81.1%	78.0%	72.6%
1 Varicella	71.7%	81.4%	78.5%	81.2%	70.3%
3 PCV	---	66.8%	79.8%	79.4%	73.2%
4 PCV	---	35.8%	47.6%	58.8%	56.5%

*PCV data not collected before 2004.

Table 24 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 58.5% to 73.2% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	263	83.0%
DTP2/DTaP2	247	77.9%
DTP3/DTaP3	225	71.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	266	83.9%
OPV/IPV2	251	79.2%
OPV/IPV3	172	54.3%
OPV/IPV4	0	0.0%
MMR1	7	2.2%
MMR2	0	0.0%
HIB1	265	83.6%
HIB2	247	77.9%
HIB3	80	25.2%
HIB4	1	0.3%
HIB5	0	0.0%
HEPB1	265	83.6%
HEPB2	247	77.9%
HEPB3	159	50.2%
HEPB4	7	2.2%
VAR1	9	2.8%
VAR2	0	0.0%
PCV1	262	82.6%
PCV2	246	77.6%
PCV3	213	67.2%
PCV4	8	2.5%
PCV5	0	0.0%

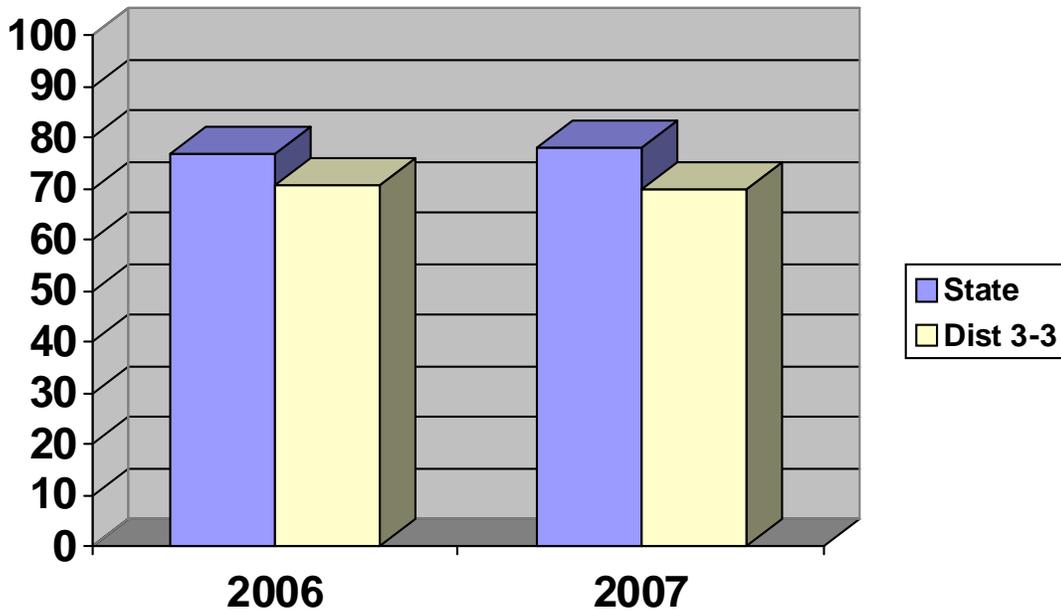
*Percent = number immunized / sample size
Sample size = 317

Individual Health District Report: District 3-3

The eligible sample from this district included 186 children born in January 2005. From the 186 children, 152 records were located (Response Rate=81.7%). Of the 152 located records, there were no parental refusals leaving a final sample of 152 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 69.7% (106/152).**
This rate is much lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 9: 4:3:1:3:3:1 Coverage for State and District 3-3



- ❖ **The 4:3:1:3 immunization coverage estimate is 73.0% (111/152).** This rate is lower than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 68.4% (104/152).** This rate is also lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	79.1%	67.4%	58.6%	78.0%	75.0%
3 OPV/IPV	85.8%	74.4%	68.4%	85.4%	90.1%
1 MMR	85.1%	75.6%	65.6%	86.0%	82.9%
3 Hib	88.4%	76.7%	71.7%	84.8%	83.6%
3 HepB	88.8%	77.9%	75.0%	86.6%	91.4%
1 Varicella	84.7%	74.4%	67.2%	86.0%	82.9%
3 PCV	---	30.2%	62.7%	78.7%	88.2%
4 PCV	---	11.6%	22.5%	52.4%	54.6%

*PCV data not collected before 2004.

Table 26 reveals the coverage rates of each vaccine series. Coverage rates ranged from 54.6% to 91.4% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-3**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	149	98.0%
DTP2/DTaP2	141	92.8%
DTP3/DTaP3	127	83.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	149	98.0%
OPV/IPV2	142	93.4%
OPV/IPV3	110	72.4%
OPV/IPV4	1	0.7%
MMR1	15	9.9%
MMR2	0	0.0%
HIB1	149	98.0%
HIB2	140	92.1%
HIB3	55	36.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	148	97.4%
HEPB2	146	96.1%
HEPB3	114	75.0%
HEPB4	4	2.6%
VAR1	19	12.5%
VAR2	0	0.0%
PCV1	145	95.4%
PCV2	135	88.8%
PCV3	118	77.6%
PCV4	5	3.3%
PCV5	0	0.0%

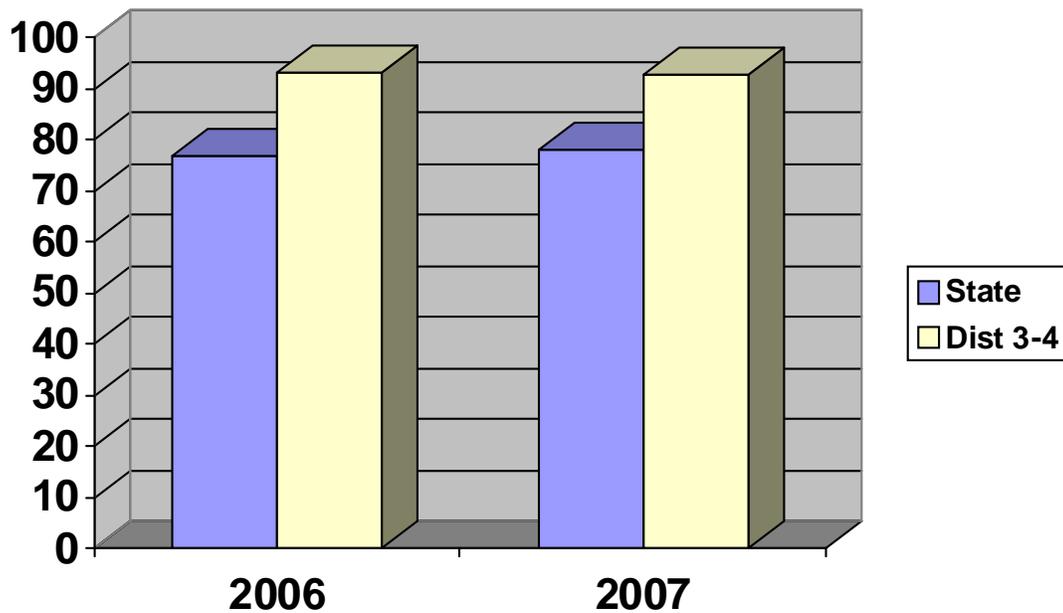
*Percent = number immunized / sample size
Sample size = 152

Individual Health District Report: District 3-4

The eligible sample from this district included 87 children born in January 2005. From the 87 children, 82 records were located (Response Rate=94.3%). Of the 82 located records, there was 1 parental refusal leaving a final sample of 81 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 92.6% (75/81).** This rate is much higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 10: 4:3:1:3:3:1 Coverage for State and District 3-4



- ❖ **The 4:3:1:3 immunization coverage estimate is 93.8% (76/81).** This rate is also much higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 92.6% (75/81).** This rate is also much higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	90.0%	94.1%	92.4%	94.9%	96.3%
3 OPV/IPV	90.0%	96.1%	90.2%	97.4%	96.3%
1 MMR	90.0%	96.1%	91.3%	95.7%	95.1%
3 Hib	90.0%	96.7%	92.4%	96.6%	95.1%
3 HepB	90.0%	96.7%	91.3%	95.7%	96.3%
1 Varicella	90.0%	94.1%	92.4%	95.7%	96.3%
3 PCV	---	76.5%	90.2%	95.7%	95.1%
4 PCV	---	40.5%	53.3%	81.2%	88.9%

*PCV data not collected before 2004.

Table 28 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 88.9% to 96.3% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-4**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	78	96.3%
DTP2/DTaP2	77	95.1%
DTP3/DTaP3	74	91.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	78	96.3%
OPV/IPV2	77	95.1%
OPV/IPV3	50	61.7%
OPV/IPV4	0	0.0%
MMR1	2	2.5%
MMR2	0	0.0%
HIB1	78	96.3%
HIB2	77	95.1%
HIB3	24	29.6%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	78	96.3%
HEPB2	78	96.3%
HEPB3	59	72.8%
HEPB4	12	14.8%
VAR1	3	3.7%
VAR2	0	0.0%
PCV1	77	95.1%
PCV2	75	92.6%
PCV3	73	90.1%
PCV4	2	2.5%
PCV5	0	0.0%

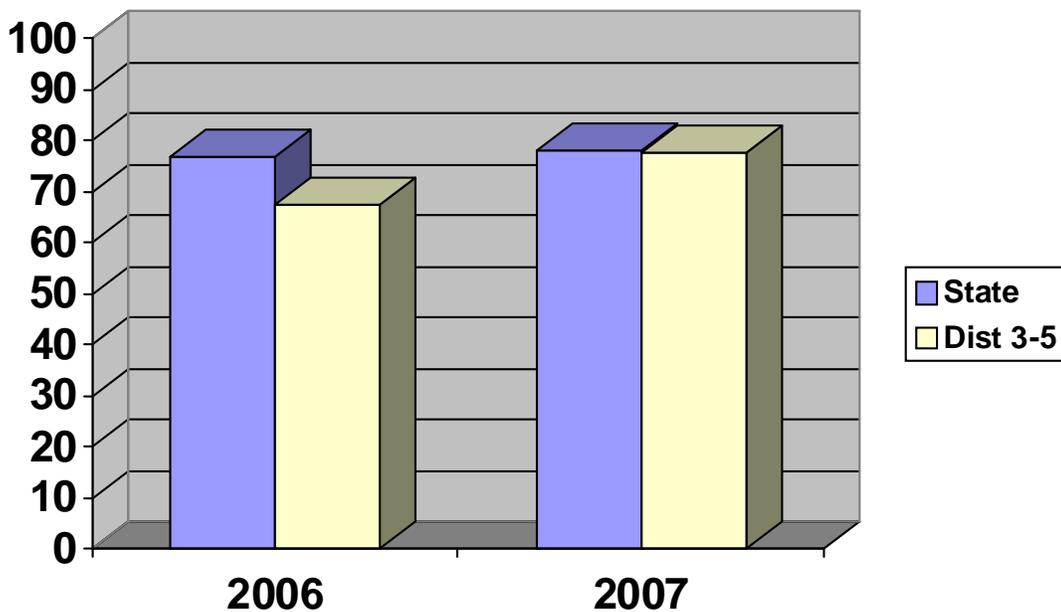
*Percent = number immunized / sample size
Sample size = 81

Individual Health District Report: District 3-5

The eligible sample from this district included 243 children born in January 2005. From the 243 children, 224 records were located (Response Rate=92.2%). Of the 224 located records, there were 3 parental refusals leaving a final sample of 221 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 77.8% (172/221).**
This rate is slightly lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 11: 4:3:1:3:3:1 Coverage for State and District 3-5



- ❖ **The 4:3:1:3 immunization coverage estimate is 81.4% (180/221).** This rate is slightly higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 76.5% (169/221).** This rate is nearly equal to the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	66.0%	82.4%	74.0%	76.5%	84.2%
3 OPV/IPV	82.0%	89.5%	83.1%	81.1%	88.2%
1 MMR	80.7%	90.8%	84.8%	84.4%	90.0%
3 Hib	76.0%	88.3%	82.3%	79.4%	86.4%
3 HepB	78.0%	89.1%	82.3%	80.2%	89.1%
1 Varicella	74.0%	89.5%	85.7%	84.8%	89.1%
3 PCV	---	43.5%	73.2%	77.8%	90.0%
4 PCV	---	19.7%	38.5%	51.4%	73.8%

*PCV data not collected before 2004.

Table 30 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 73.8% to 90.0% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-5**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	212	95.9%
DTP2/DTaP2	209	94.6%
DTP3DTaP3	192	86.9%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	212	95.9%
OPV/IPV2	208	94.1%
OPV/IPV3	106	48.0%
OPV/IPV4	0	0.0%
MMR1	8	3.6%
MMR2	0	0.0%
HIB1	212	95.9%
HIB2	205	92.8%
HIB3	54	24.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	214	96.8%
HEPB2	208	94.1%
HEPB3	125	56.6%
HEPB4	0	0.0%
VAR1	9	4.1%
VAR2	0	0.0%
PCV1	208	94.1%
PCV2	203	91.9%
PCV3	181	81.9%
PCV4	6	2.7%
PCV5	0	0.0%

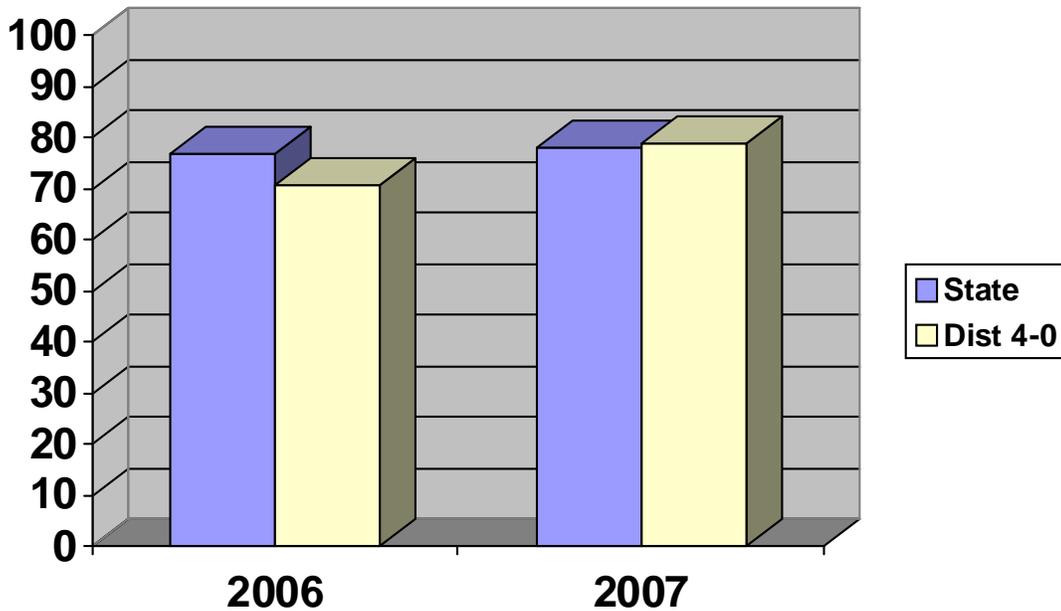
*Percent = number immunized / sample size
Sample size = 221

Individual Health District Report: District 4-0

The eligible sample from this district included 245 children born in January 2005. From the 245 children, 226 records were located (Response Rate=92.2%). Of the 226 located records, there was 1 parental refusal leaving a final sample of 225 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 78.7% (177/225).**
This rate is slightly higher than the statewide 4:3:1:3:3:1 immunization rate of 78%

Figure 12: 4:3:1:3:3:1 Coverage for State and District 4-0



- ❖ **The 4:3:1:3 immunization coverage estimate is 81.3% (183/225).** This rate is also slightly higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 76.0% (171/225).** This rate is slightly lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	84.5%	79.1%	83.9%	75.0%	83.1%
3 OPV/IPV	92.7%	85.6%	87.0%	88.6%	93.3%
1 MMR	92.7%	85.0%	89.2%	83.2%	88.9%
3 Hib	87.3%	86.6%	88.8%	84.8%	89.8%
3 HepB	92.7%	86.1%	90.1%	89.7%	92.9%
1 Varicella	92.7%	85.0%	89.7%	83.7%	88.9%
3 PCV	---	32.1%	78.0%	81.5%	89.8%
4 PCV	---	9.1%	26.9%	58.2%	71.1%

*PCV data not collected before 2004.

Table 32 reveals the coverage rates of each vaccine series. Coverage rates ranged from 71.1% to 93.3% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 4-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	218	96.9%
DTP2/DTaP2	214	95.1%
DTP3/DTaP3	196	87.1%
DTP4/DTaP4	2	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	219	97.3%
OPV/IPV2	215	95.6%
OPV/IPV3	153	68.0%
OPV/IPV4	1	0.4%
MMR1	7	3.1%
MMR2	0	0.0%
HIB1	220	97.8%
HIB2	215	95.6%
HIB3	51	22.7%
HIB4	1	0.4%
HIB5	0	0.0%
HEPB1	219	97.3%
HEPB2	216	96.0%
HEPB3	158	70.2%
HEPB4	30	13.3%
VAR1	7	3.1%
VAR2	0	0.0%
PCV1	213	94.7%
PCV2	204	90.7%
PCV3	172	76.4%
PCV4	3	1.3%
PCV5	0	0.0%

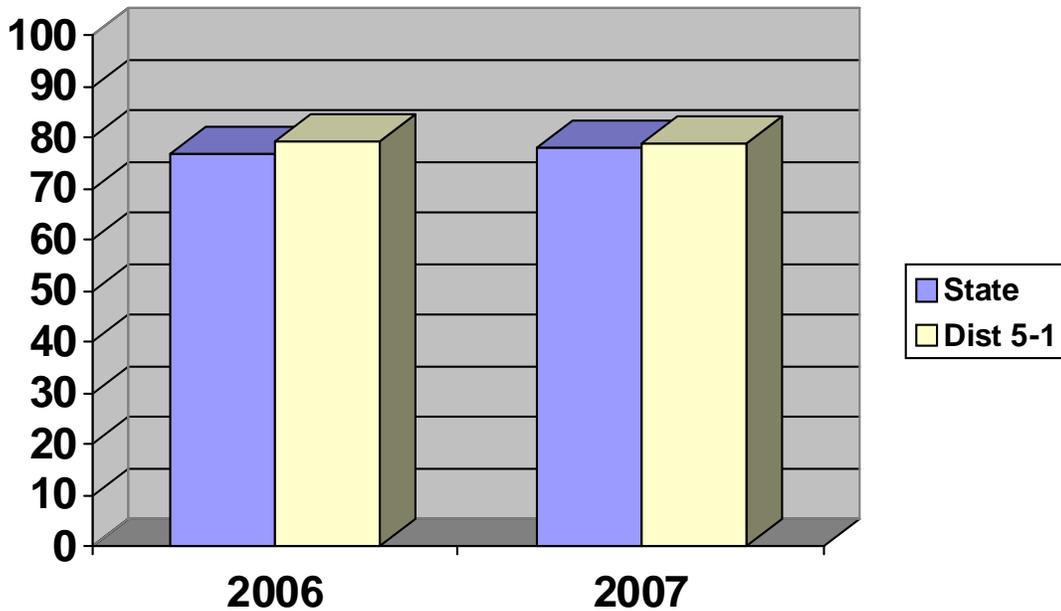
*Percent = number immunized / sample size
Sample size = 184

Individual Health District Report: District 5-1

The eligible sample from this district included 68 children born in January 2005. From the 68 children, 67 records were located (Response Rate=98.5%). Of the 67 located records, there was 1 parental refusal leaving a final sample of 66 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate 78.8% (52/66).** This rate is slightly higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 13: 4:3:1:3:3:1 Coverage for State and District 5-1



- ❖ **The 4:3:1:3 immunization coverage estimate 92.4% (61/66).** This rate is much higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate 77.3% (51/66).** This rate is higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	93.3%	85.5%	94.7%	89.6%	93.9%
3 OPV/IPV	97.8%	92.7%	96.0%	95.8%	97.0%
1 MMR	97.8%	90.9%	96.0%	100.0%	98.5%
3 Hib	97.8%	87.3%	96.0%	93.8%	92.4%
3 HepB	96.7%	90.9%	96.0%	97.8%	93.9%
1 Varicella	95.6%	90.9%	97.3%	97.9%	97.0%
3 PCV	---	23.6%	82.7%	87.5%	95.5%
4 PCV	---	3.6%	32.0%	72.9%	78.8%

*PCV data not collected before 2004.

Table 34 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 78.8% to 98.5% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-1**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	65	98.5%
DTP2/DTaP2	65	98.5%
DTP3/DTaP3	59	89.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	65	98.5%
OPV/IPV2	65	98.5%
OPV/IPV3	46	69.7%
OPV/IPV4	0	0.0%
MMR1	4	6.1%
MMR2	0	0.0%
HIB1	65	98.5%
HIB2	65	98.5%
HIB3	12	18.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	65	98.5%
HEPB2	64	97.0%
HEPB3	47	71.2%
HEPB4	6	9.1%
VAR1	2	3.0%
VAR2	0	0.0%
PCV1	65	98.5%
PCV2	65	98.5%
PCV3	57	86.4%
PCV4	2	3.0%
PCV5	0	0.0%

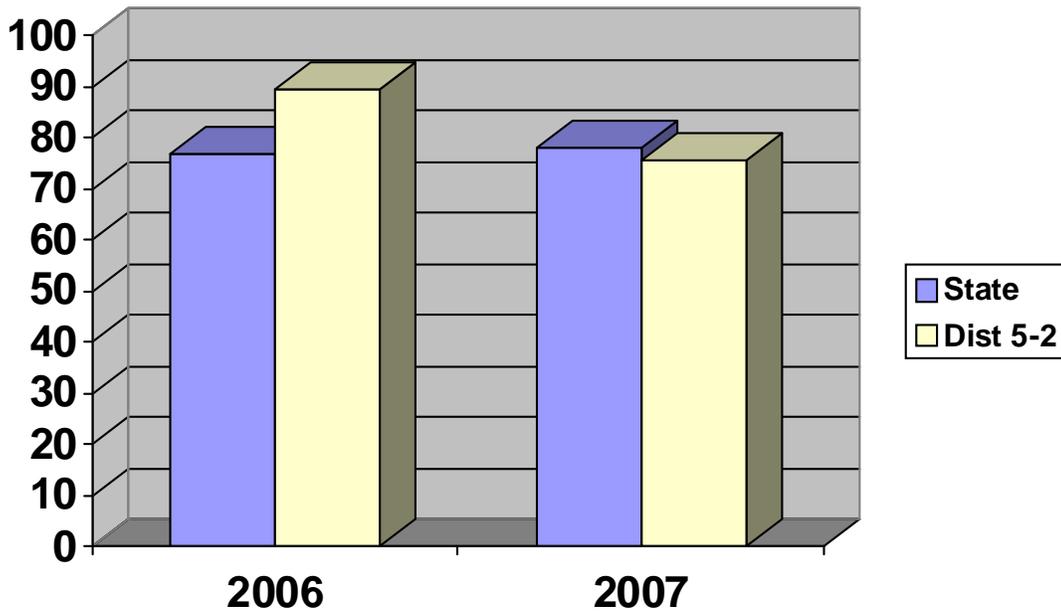
*Percent = number immunized / sample size
Sample size = 66

Individual Health District Report: District 5-2

The eligible sample from this district included 86 children born in January 2005. From the 86 children, 81 records were located (Response Rate=94.2%). Of the 81 located records, there were 3 parental refusals leaving a final sample of 78 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 75.6% (59/78).** This rate is lower to the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 14: 4:3:1:3:3:1 Coverage for State and District 5-2



- ❖ **The 4:3:1:3 immunization coverage estimate is 80.8% (63/78).** This rate is equal to the statewide 4:3:1:3 immunization rate.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 74.4% (58/78).** This rate is lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	84.9%	87.1%	88.5%	94.7%	88.5%
3 OPV/IPV	93.7%	93.2%	94.2%	96.9%	93.6%
1 MMR	96.8%	93.2%	92.1%	95.4%	92.3%
3 Hib	91.3%	91.2%	90.6%	97.7%	87.2%
3 HepB	93.7%	91.8%	92.1%	96.9%	92.3%
1 Varicella	92.9%	91.2%	92.8%	96.9%	92.3%
3 PCV	---	39.5%	69.1%	90.1%	91.0%
4 PCV	---	15.0%	36.0%	68.7%	84.6%

*PCV data not collected before 2004.

Table 36 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 84.6% to 93.6% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	76	97.4%
DTP2/DTaP2	75	96.2%
DTP3/DTaP3	69	88.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	76	97.4%
OPV/IPV2	75	96.2%
OPV/IPV3	59	75.6%
OPV/IPV4	0	0.0%
MMR1	2	2.6%
MMR2	0	0.0%
HIB1	75	96.2%
HIB2	73	93.6%
HIB3	14	17.9%
HIB4	1	1.3%
HIB5	0	0.0%
HEPB1	77	98.7%
HEPB2	75	96.2%
HEPB3	50	64.1%
HEPB4	10	12.8%
VAR1	2	2.6%
VAR2	0	0.0%
PCV1	76	97.4%
PCV2	74	94.9%
PCV3	69	88.5%
PCV4	2	2.6%
PCV5	0	0.0%

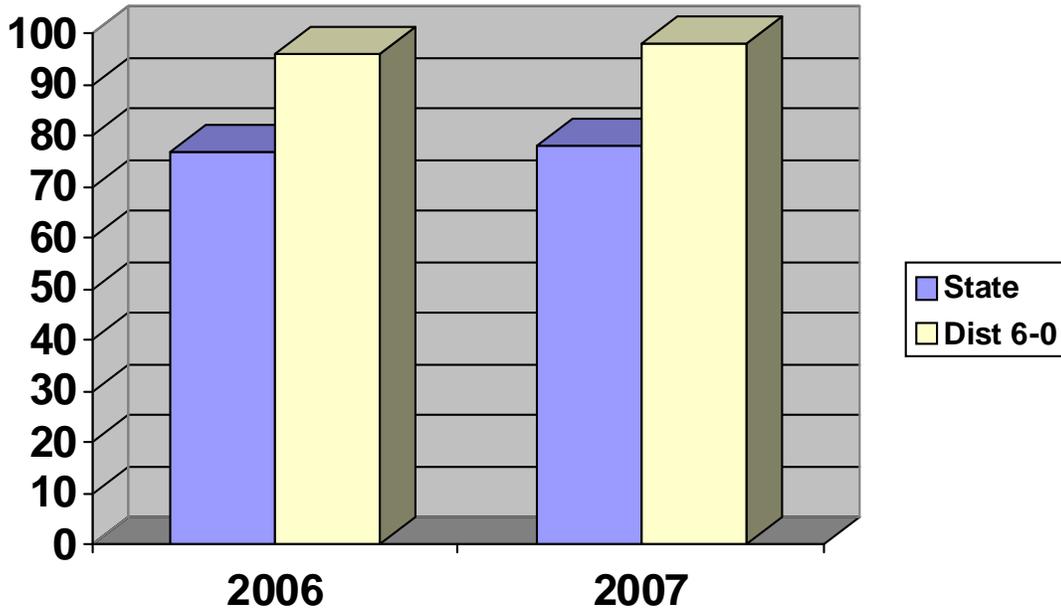
*Percent = number immunized / sample size
Sample size = 78

Individual Health District Report: District 6-0

The eligible sample from this district included 47 children born in January 2005. From the 47 children, 47 records were located (Response Rate=100%). Of the 47 located records, there were no parental refusals leaving a final sample of 47 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 97.9% (46/47).** This rate is much higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 15: 4:3:1:3:3:1 Coverage for State and District 6-0



- ❖ **The 4:3:1:3 immunization coverage estimate is 97.9% (46/47).** This rate is also much higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 97.9% (46/47).** This rate is also much higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	87.8%	90.5%	94.8%	98.6%	97.9%
3 OPV/IPV	91.9%	94.8%	97.4%	100.0%	100.0%
1 MMR	91.9%	95.7%	94.8%	98.6%	100.0%
3 Hib	93.5%	92.2%	94.8%	98.6%	97.9%
3 HepB	95.1%	94.0%	95.7%	100.0%	100.0%
1 Varicella	90.2%	94.8%	93.9%	98.6%	100.0%
3 PCV	---	54.3%	90.4%	97.3%	93.6%
4 PCV	---	23.3%	52.2%	82.4%	89.4%

*PCV data not collected before 2004.

Table 38 reveals the coverage rates of each vaccine series. Coverage rates ranged from 89.4% to 100.0% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 6-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	46	97.9%
DTP2/DTaP2	46	97.9%
DTP3/DTaP3	43	91.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	46	97.9%
OPV/IPV2	46	97.9%
OPV/IPV3	33	70.2%
OPV/IPV4	0	0.0%
MMR1	1	2.1%
MMR2	0	0.0%
HIB1	46	97.9%
HIB2	46	97.9%
HIB3	19	40.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	46	97.9%
HEPB2	46	97.9%
HEPB3	36	76.6%
HEPB4	1	2.1%
VAR1	1	2.1%
VAR2	0	0.0%
PCV1	44	93.6%
PCV2	44	93.6%
PCV3	40	85.1%
PCV4	0	0.0%
PCV5	0	0.0%

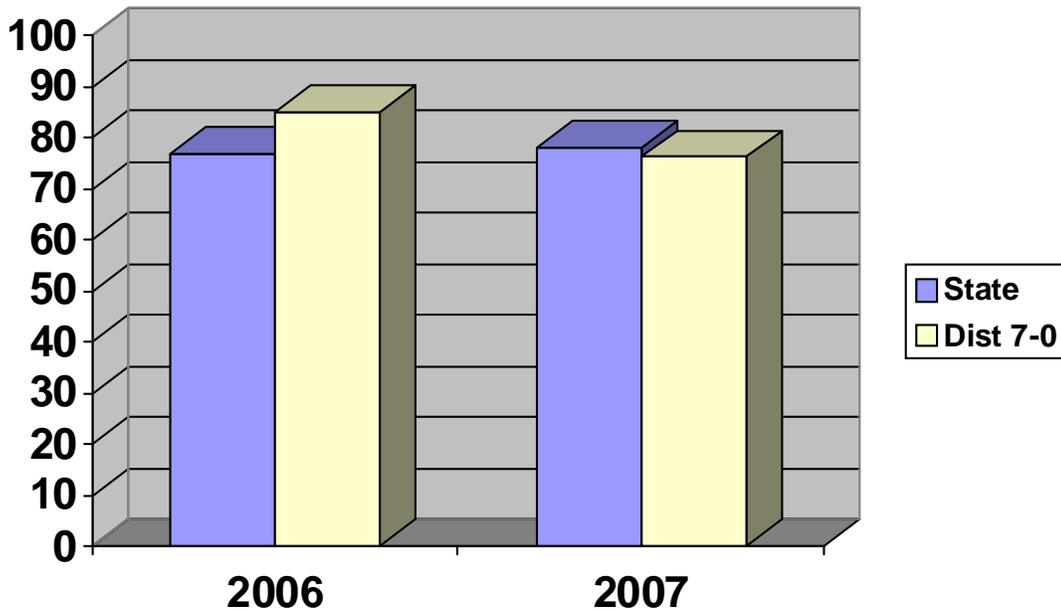
*Percent = number immunized / sample size
Sample size = 47

Individual Health District Report: District 7-0

The eligible sample from this district included 112 children born in January 2005. From the 112 children, 105 records were located (Response Rate=93.8%). Of the 100 located records, there were no parental refusals leaving a final sample of 105 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 76.2% (80/105).** This rate is lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 16: 4:3:1:3:3:1 Coverage for State and District 7-0



- ❖ **The 4:3:1:3 immunization coverage estimate is 77.1% (90/100).** This rate is also lower than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 75.2% (79/105).** This rate is also lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	77.1%	88.4%	90.3%	90.0%	79.0%
3 OPV/IPV	85.0%	93.5%	92.9%	96.0%	88.6%
1 MMR	87.9%	93.0%	93.8%	95.0%	90.5%
3 Hib	85.7%	93.0%	91.2%	92.0%	86.7%
3 HepB	87.9%	93.5%	93.8%	97.0%	91.4%
1 Varicella	85.7%	93.5%	93.8%	96.0%	89.5%
3 PCV	---	34.2%	67.3%	82.0%	89.5%
4 PCV	---	10.1%	35.4%	52.0%	68.6%

*PCV data not collected before 2004.

Table 40 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 68.6% to 91.4% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 7-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	100	95.2%
DTP2/DTaP2	96	91.4%
DTP3/DTaP3	87	82.9%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	100	95.2%
OPV/IPV2	96	91.4%
OPV/IPV3	46	43.8%
OPV/IPV4	0	0.0%
MMR1	3	2.9%
MMR2	0	0.0%
HIB1	99	94.3%
HIB2	95	90.5%
HIB3	44	41.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	101	96.2%
HEPB2	100	95.2%
HEPB3	70	66.7%
HEPB4	2	1.9%
VAR1	4	3.8%
VAR2	0	0.0%
PCV1	100	95.2%
PCV2	94	89.5%
PCV3	80	76.2%
PCV4	4	3.8%
PCV5	0	0.0%

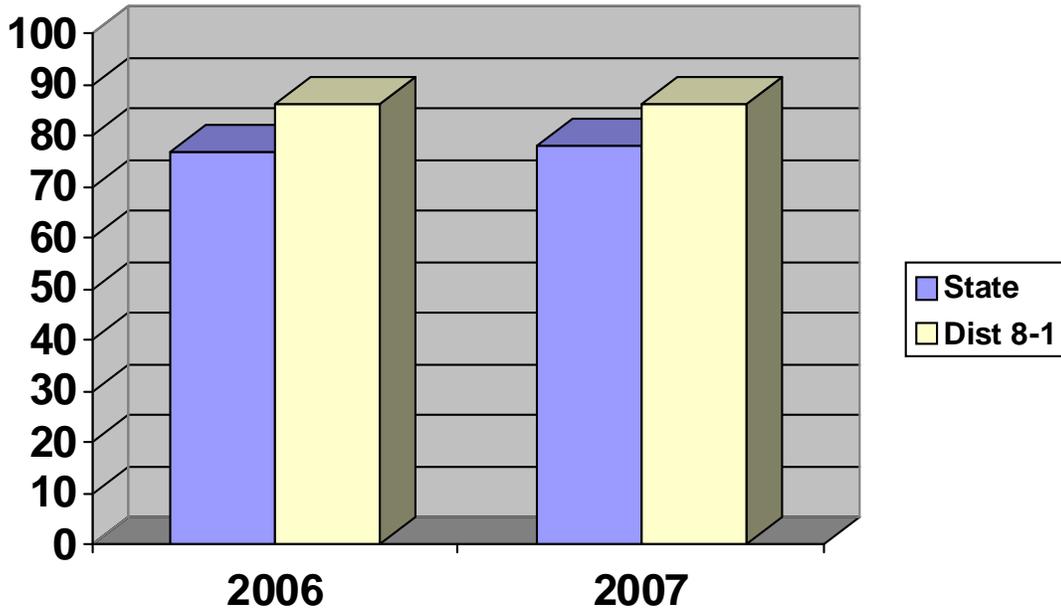
*Percent = number immunized / sample size
Sample size = 105

Individual Health District Report: District 8-1

The eligible sample from this district included 104 children born in January 2005. From the 104 children, 95 records were located (Response Rate=91.3%). Of the 95 located records, there were no parental refusals leaving a final sample of 95 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 86.3% (82/95).** This rate is higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 17: 4:3:1:3:3:1 Coverage for State and District 8-1



- ❖ **The 4:3:1:3 immunization coverage estimate is 87.4% (83/95).** This rate is also higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 84.2% (80/95).** This rate is also higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	91.9%	89.5%	94.3%	89.7%	87.4%
3 OPV/IPV	96.0%	96.1%	97.7%	91.4%	95.8%
1 MMR	95.2%	92.1%	97.7%	89.7%	94.7%
3 Hib	95.2%	94.7%	96.6%	93.1%	97.9%
3 HepB	96.0%	96.1%	97.7%	94.8%	97.9%
1 Varicella	94.4%	92.1%	96.6%	91.4%	94.7%
3 PCV	---	39.5%	88.6%	87.9%	94.7%
4 PCV	---	13.2%	31.8%	53.4%	80.0%

*PCV data not collected before 2004.

Table 42 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 80.0% to 97.9% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	94	98.9%
DTP2/DTaP2	94	98.9%
DTP3/DTaP3	90	94.7%
DTP4/DTaP4	1	1.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	94	98.9%
OPV/IPV2	93	97.9%
OPV/IPV3	66	69.5%
OPV/IPV4	0	0.0%
MMR1	3	3.2%
MMR2	0	0.0%
HIB1	94	98.9%
HIB2	94	98.9%
HIB3	15	15.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	95	100.0%
HEPB2	94	98.9%
HEPB3	58	61.1%
HEPB4	5	5.3%
VAR1	7	7.4%
VAR2	0	0.0%
PCV1	92	96.8%
PCV2	91	95.8%
PCV3	86	90.5%
PCV4	4	4.2%
PCV5	0	0.0%

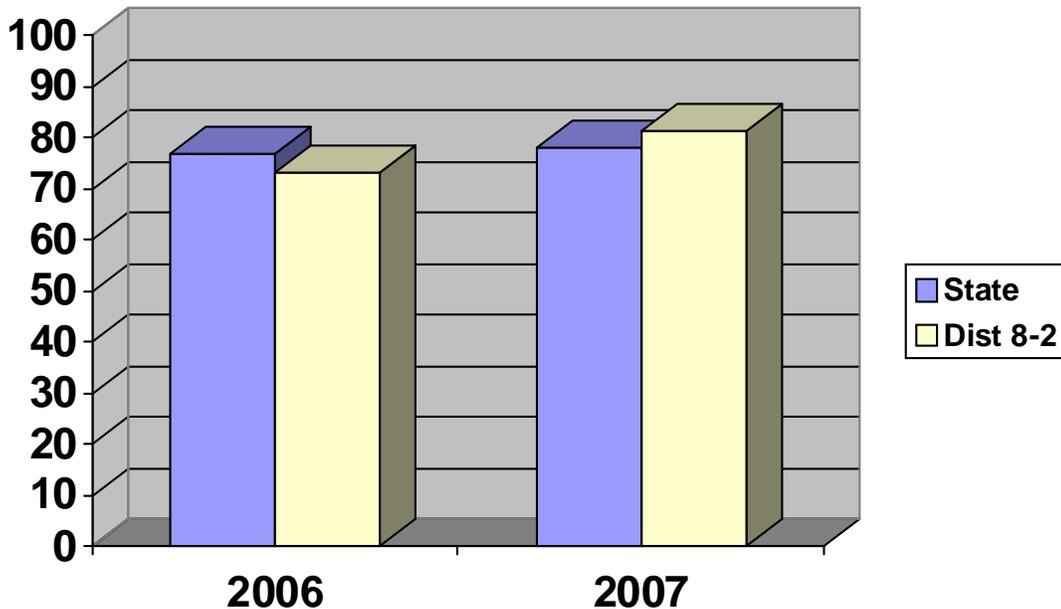
*Percent = number immunized / sample size
Sample size = 95

Individual Health District Report: District 8-2

The eligible sample from this district included 169 children born in January 2005. From the 169 children, 165 records were located (Response Rate=97.6%). Of the 165 located records, there were no parental refusals leaving a final sample of 165 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate rate is 81.2% (134/165).** This rate is higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 18: 4:3:1:3:3:1 Coverage for State and District 8-2



- ❖ **The 4:3:1:3 immunization coverage estimate rate is 81.8% (135/165).** This rate is also higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate rate is 80.6% (133/165).** This rate is also higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	75.3%	94.9%	87.1%	77.2%	83.0%
3 OPV/IPV	80.7%	97.7%	91.9%	85.8%	89.7%
1 MMR	81.3%	97.7%	93.5%	87.4%	90.9%
3 Hib	81.3%	98.3%	93.5%	91.3%	90.3%
3 HepB	82.0%	97.7%	98.4%	89.8%	93.9%
1 Varicella	78.0%	97.7%	93.5%	85.0%	90.3%
3 PCV	---	38.9%	85.5%	81.1%	90.9%
4 PCV	---	8.0%	27.4%	62.2%	70.9%

*PCV data not collected before 2004.

Table 44 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 70.9% to 93.9% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	162	98.2%
DTP2/DTaP2	157	95.2%
DTP3/DTaP3	147	89.1%
DTP4/DTaP4	1	0.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	162	98.2%
OPV/IPV2	157	95.2%
OPV/IPV3	104	63.0%
OPV/IPV4	0	0.0%
MMR1	3	1.8%
MMR2	0	0.0%
HIB1	162	98.2%
HIB2	155	93.9%
HIB3	56	33.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	163	98.8%
HEPB2	162	98.2%
HEPB3	123	74.5%
HEPB4	5	3.0%
VAR1	2	1.2%
VAR2	0	0.0%
PCV1	159	96.4%
PCV2	149	90.3%
PCV3	133	80.6%
PCV4	0	0.0%
PCV5	0	0.0%

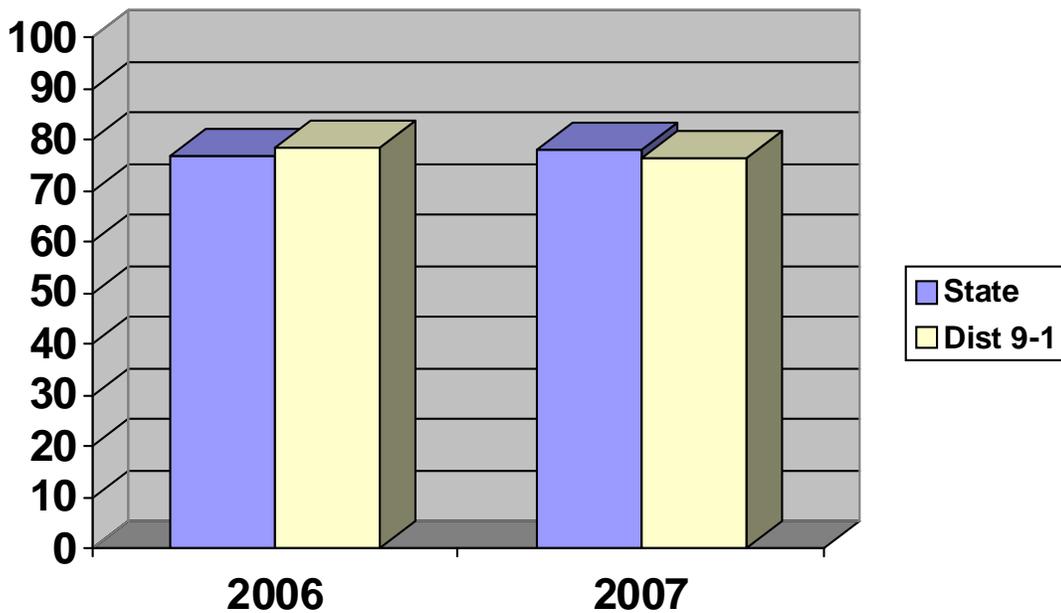
*Percent = number immunized / sample size
Sample size = 165

Individual Health District Report: District 9-1

The eligible sample from this district included 147 children born in January 2005. From the 147 children, 141 records were located (Response Rate=95.9%). Of the 141 located records, there was 1 parental refusal leaving a final sample of 140 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 76.4% (107/140).**
This rate is lower than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 19: 4:3:1:3:3:1 Coverage for State and District 9-1



- ❖ **The 4:3:1:3 immunization coverage estimate is 82.1% (115/140).** This rate is higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 72.9% (102/140).** This rate is lower than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	77.3%	97.5%	87.0%	85.1%	82.9%
3 OPV/IPV	88.7%	98.8%	94.4%	93.5%	90.0%
1 MMR	90.0%	98.8%	92.6%	91.1%	90.7%
3 Hib	87.3%	98.8%	94.4%	93.5%	88.6%
3 HepB	79.3%	100%	96.3%	92.9%	89.3%
1 Varicella	83.3%	98.8%	94.4%	92.9%	88.6%
3 PCV	---	53.1%	75.9%	82.7%	85.7%
4 PCV	---	17.3%	33.3%	61.9%	73.6%

*PCV data not collected before 2004.

Table 46 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 73.6% to 90.7% for the 2007 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 %age 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-1**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	134	95.7%
DTP2/DTaP2	128	91.4%
DTP3/DTaP3	121	86.4%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	134	95.7%
OPV/IPV2	127	90.7%
OPV/IPV3	95	67.9%
OPV/IPV4	1	0.7%
MMR1	3	2.1%
MMR2	0	0.0%
HIB1	133	95.0%
HIB2	126	90.0%
HIB3	39	27.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	136	97.1%
HEPB2	128	91.4%
HEPB3	75	53.6%
HEPB4	3	2.1%
VAR1	1	0.7%
VAR2	0	0.0%
PCV1	127	90.7%
PCV2	121	86.4%
PCV3	107	76.4%
PCV4	2	1.4%
PCV5	0	0.0%

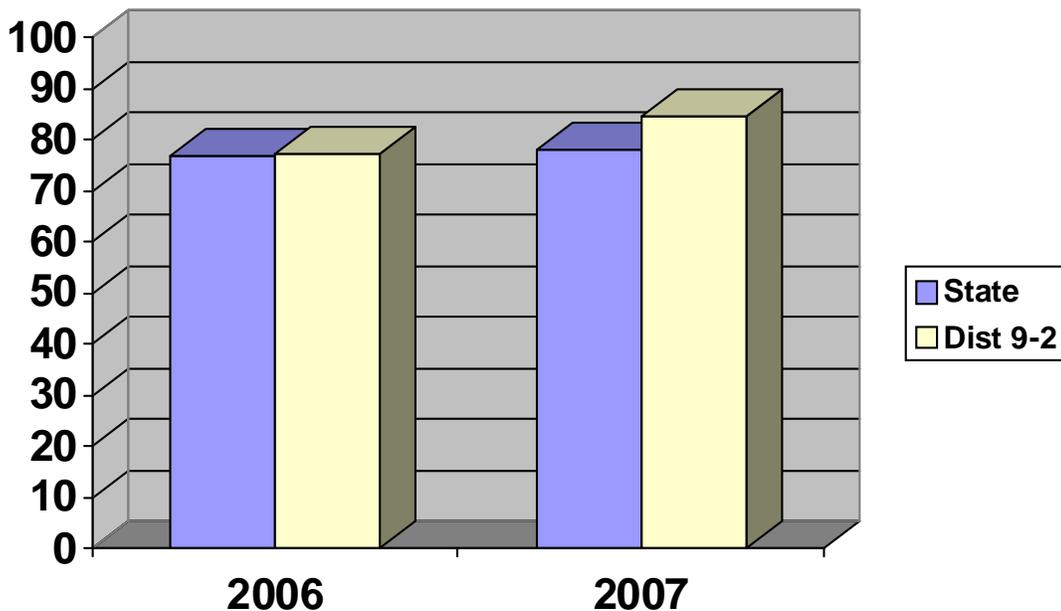
*Percent = number immunized / sample size
Sample size = 140

Individual Health District Report: District 9-2

The eligible sample from this district included 145 children born in January 2005. From the 145 children, 133 records were located (Response Rate=91.7%). Of the 133 located records, there were 4 parental refusals leaving a final sample of 129 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 84.5% (109/129).**
This rate is higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 20: 4:3:1:3:3:1 Coverage for State and District 9-2



- ❖ **The 4:3:1:3 immunization coverage estimate is 87.6% (113/129).** This rate is also higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 82.2% (106/129).** This rate is also higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	82.6%	83.0%	86.0%	83.7%	89.1%
3 OPV/IPV	88.4%	90.4%	93.3%	92.7%	93.0%
1 MMR	90.6%	89.6%	92.1%	86.2%	93.8%
3 Hib	86.2%	91.1%	91.5%	86.2%	91.5%
3 HepB	87.7%	90.4%	95.7%	90.2%	94.6%
1 Varicella	91.3%	90.4%	93.3%	87.8%	94.6%
3 PCV	---	39.3%	79.3%	89.4%	92.2%
4 PCV	---	5.2%	28.7%	54.5%	75.2%

*PCV data not collected before 2004.

Table 48 reveals the coverage rates of each vaccine series. Coverage rates ranged from 75.2% to 94.6% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	125	96.9%
DTP2/DTaP2	121	93.8%
DTP3/DTaP3	113	87.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	125	96.9%
OPV/IPV2	121	93.8%
OPV/IPV3	92	71.3%
OPV/IPV4	0	0.0%
MMR1	6	4.7%
MMR2	0	0.0%
HIB1	124	96.1%
HIB2	119	92.2%
HIB3	18	14.0%
HIB4	1	0.8%
HIB5	0	0.0%
HEPB1	127	98.4%
HEPB2	122	94.6%
HEPB3	96	74.4%
HEPB4	16	12.4%
VAR1	5	3.9%
VAR2	0	0.0%
PCV1	125	96.9%
PCV2	121	93.8%
PCV3	107	82.9%
PCV4	3	2.3%
PCV5	0	0.0%

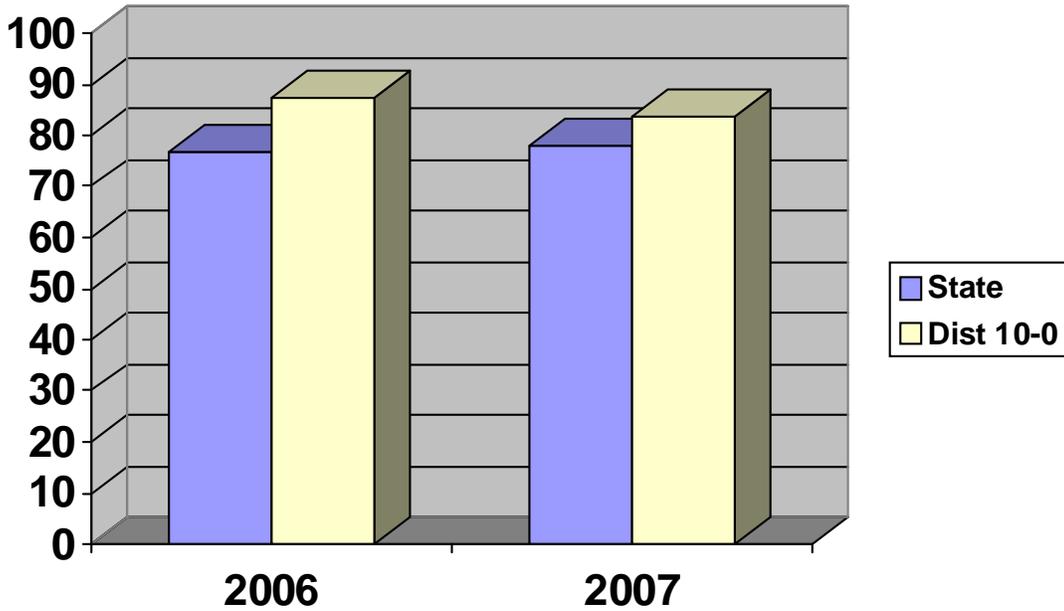
*Percent = number immunized / sample size
Sample size = 129

Individual Health District Report: District 10-0

The eligible sample from this district included 111 children born in January 2005. From the 111 children, 105 records were located (Response Rate=94.6%). Of the 105 located records, there was 1 parental refusal leaving a final sample of 104 records.

- ❖ **The 4:3:1:3:3:1 immunization coverage estimate is 83.7% (87/104).** This rate is higher than the statewide 4:3:1:3:3:1 immunization rate of 78%.

Figure 21: 4:3:1:3:3:1 Coverage for State and District 10-0



- ❖ **The 4:3:1:3 immunization coverage estimate is 85.6% (89/104).** This rate is also higher than the statewide 4:3:1:3 immunization rate of 80.8%.
- ❖ **The 4:3:1:3:3:1:3 immunization coverage estimate is 82.7% (86/104).** This rate is also higher than the statewide 4:3:1:3:3:1:3 immunization rate of 76.6%.

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

Vaccine	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates	2006 Adequate Rates	2007 Adequate Rates
4 DTP/DTaP	93.2%	94.3%	93.5%	94.4%	87.5%
3 OPV/IPV	93.2%	98.9%	98.4%	94.4%	91.3%
1 MMR	93.8%	97.7%	98.4%	94.4%	92.3%
3 Hib	95.7%	95.5%	98.4%	97.2%	89.4%
3 HepB	95.1%	94.3%	98.4%	94.4%	92.3%
1 Varicella	95.7%	94.3%	98.4%	93.1%	93.3%
3 PCV	---	60.2%	91.9%	90.3%	91.3%
4 PCV	---	25.0%	35.5%	61.1%	76.0%

*PCV data not collected before 2004.

Table 50 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 76.0% to 93.3% for the 2007 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:
2007 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 10-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	103	99.0%
DTP2/DTaP2	102	98.1%
DTP3/DTaP3	94	90.4%
DTP4/DTaP4	1	1.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	103	99.0%
OPV/IPV2	102	98.1%
OPV/IPV3	61	58.7%
OPV/IPV4	0	0.0%
MMR1	6	5.8%
MMR2	0	0.0%
HIB1	103	99.0%
HIB2	100	96.2%
HIB3	27	26.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	102	98.1%
HEPB2	102	98.1%
HEPB3	43	41.3%
HEPB4	0	0.0%
VAR1	4	3.8%
VAR2	0	0.0%
PCV1	102	98.1%
PCV2	100	96.2%
PCV3	87	83.7%
PCV4	1	1.0%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 104

Section V: Discussion

Section V: Discussion

Summary

The purpose of the eleventh 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 2007. To assess these rates, the study drew an original sample of 2,742 children born in January 2005. The final sample of returned immunization records totaled 2,742. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 2,658. Of these, 2,461 records were located and make up the final sample.

The eleventh year of the GIS, 2007, measured immunization coverage for children born in 2005 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
- 4:3:1:3 coverage, defined as 4 DTaP, 3 OPV/IPV, 1 MMR and 3 Hib

Of these three coverage levels, 4:3:1:3 coverage rates were highest and 4:3:1:3:3:1:3 rates were generally the lowest 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.

*It must be remembered that the 2007 study is estimating 2005 rates. The 2006 study is estimating 2004 rates, 2005 study estimated 2003 rates, 2004 study estimated 2002 rates and the 2003 study estimated rates for 2001.

The 2007 results reflect immunization rates for children born in 2005. The results of the study indicate that, of the 2,461 children whose immunization records were located during data collection:

- 78.0% of children born in January of 2005 in Georgia were adequately immunized with the 4:3:1:3:3:1 vaccine series.
- 80.8% of children born in January of 2005 in Georgia were adequately immunized with the 4:3:1:3 vaccine series.
- 76.6% of children born in January of 2005 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 eleventh study year, 81.2% 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 increased slightly in the 2007 study (76.8% to 78.0%). The 2007 Georgia Immunization Study measured Varicella rates for the tenth 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%), as mentioned above. The rates for the 4:3:1:3

vaccine series have also been fairly stable over the past few study years, increasing only slightly from the 2005 study (79.5%) to the 2007 study (80.8%).

The results of the previous four years of the study (2003, 2004, 2005 and 2006) show that immunization-specific coverage rates for the state have remained relatively similar.

Strengths

1. This study represents Georgia's eleventh 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 2003, 2004, 2005, 2006 and 2007 in Georgia.
4. As a measure of reliability for the data entry process, double data entry was conducted on 5% of all records entered. The data entry error rate is approximately 3% for the 2007 study.
5. The implementation of the Georgia Registry of Immunizations and Transaction Services (GRITS) has assisted with locating immunization records. The response rate for 2007 was 93.5%, which is 5% increase over the 2006 study.

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 2005 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 2005, 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 2005 who were residing in the state in 2007. 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 2005 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 2005. 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 2007. 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 52: Data Used for Sample Size Estimates for the 2007 Study. Response rates and immunization coverage levels from the 2006 study were used in the sample size calculation for the 2007 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 2005 study. The final calculated sample size is shown in the last column (Column H) of Table 52. 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 81.7% to a high of 100.0%, with the average response rate for the state at 93.5%. 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 52:
Data Used for Sample Size Estimates
for the 2007 Study

A	B	C	D	E	F	G	H
Health District	Jan 2005 Total Births	Jan 2005 Eligible Births	2006 4:3:1 Immunization Rates	2007 First Sample Estimate	2007 Second Sample Estimate	Return Rate based on 2006 Eligible Sample	2007 Adjusted Sample Size
1-1	737	721	0.81	236	178	0.907	196
1-2	556	545	0.999	50	50	0.999	50
2-0	676	666	0.926	105	91	0.966	94
3-1	970	952	0.743	293	224	0.907	247
3-2	1,059	1,033	0.686	331	251	0.77	326
3-3	408	397	0.768	274	162	0.812	200
3-4	1,310	1,280	0.949	74	70	0.945	74
3-5	953	927	0.737	29	225	0.824	274
4-0	892	861	0.739	296	220	0.885	249
5-1	149	148	0.896	143	73	0.98	74
5-2	619	604	0.931	99	85	0.964	88
6-0	538	518	0.986	50	50	0.987	50
7-0	456	388	0.9	138	102	0.909	112
8-1	298	294	0.897	142	96	0.906	106
8-2	415	403	0.764	277	164	0.914	180
9-1	692	585	0.845	201	150	0.949	158
9-2	443	432	0.829	218	145	0.969	149
10-0	448	430	0.903	135	103	0.892	115
State	11,619	11,184	0.808				2,742

Figure 22:
Explanations of Table 52
Data Used for Sample Size Estimates
For the 2007 Study

<u>Column A:</u>	Health District	District number.
<u>Column B:</u>	January 2005 Total Births	Source: DHR Vital Records Office.
<u>Column C:</u>	January 2005 Eligible Births	
<u>Column D:</u>	2006 4:3:1 Immunization Rates	Source: Georgia Birth Cohort Follow-up Study (2005).
<u>Column E:</u>	First Sample Estimate - 2007 Study	Formula Used: $3.8416 \times (D) (1 - D) / .0025$
<u>Column F:</u>	Second Sample Estimate - 2007 Study	Adjustment for small size district populations. Formula Used: $E / (1 + E/C)$.
<u>Column G:</u>	Estimated Return Rate (Based on 2006 Study)	Given. Source: Georgia Birth Cohort Follow-up Study (2005).
<u>Column H:</u>	Adjusted Sample Size - 2007 Study	Formula Used: $(\text{Column F}) / (\text{Column G})$

APPENDIX B:

**LIST OF 2007 PUBLIC HEALTH REPRESENTATIVES
FOR THE
GEORGIA IMMUNIZATION STUDY**

APPENDIX B: LIST OF 2007 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	Joy Stymest Karen Dibling, R.N., B.S.N.
3-2	Georgia Goseer, R.N. Jessica Harris
3-3	Freda Sheppard, L.P.N.
3-4	Brenda Crowe Gloria Melvin
3-5	Vivian Womack Joyce Hess, R.N.
4-0	Tina Dempsey, L.P.N. Deborah Cox, L.P.N. Amy Fenn, RN
5-1	Donna Forth, R.N. Kelly Knight
5-2	Debbie Liby, R.N. Evans Ward, M.S.
6-0	Melba McNorrill, R.N. Clois Witt, R.N., B.S.N.
7-0	Beverly Roberson, R.N., B.S.N.
8-1	Yugonda Thomas Courtney D. Sheeley, M.P.A. D. Geneine Godfrey, M.P.H.
8-2	Sue Dale Edward W. Sullivan
9-1	Marianne Pappas, R.N. Cathy Schmidt, R.N. Joanne Burnsed, B.S.N. Nan Swindell, B.S.N. Katie Golden, B.S.N. Barbara Scott, R.N. Annie Washington, R.N. Debbie Melton, R.N. Karen Mikell, R.N.
9-2	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 Barbie Bushey, R.N., C.P.N., M.P.H.

APPENDIX C:
DATA COLLECTION FORM

APPENDIX D:
VARICELLA VACCINE AND
CHICKEN POX DATA

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 53 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 53:
2007 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	162	89.0	164	90.1	1	0.5
1-2	42	95.5	43	97.7	0	0.0
2-0	79	94.0	83	98.8	0	0.0
3-1	190	84.1	196	86.7	1	0.4
3-2	215	67.8	223	70.3	0	0.0
3-3	122	80.3	126	82.9	0	0.0
3-4	76	93.8	78	96.3	0	0.0
3-5	186	84.2	197	89.1	0	0.0
4-0	193	85.8	200	88.9	0	0.0
5-1	56	84.8	64	97.0	0	0.0
5-2	65	83.3	72	92.3	0	0.0
6-0	46	97.9	47	100.0	0	0.0
7-0	92	87.6	94	89.5	0	0.0
8-1	88	92.6	90	94.7	0	0.0
8-2	147	89.1	149	90.3	0	0.0
9-1	119	85.0	124	88.6	0	0.0
9-2	116	89.9	122	94.6	0	0.0
10-0	92	88.5	97	93.3	0	0.0
Statewide	2,086	84.8	2,169	88.1	2	0.08

Figure 23: 2007 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

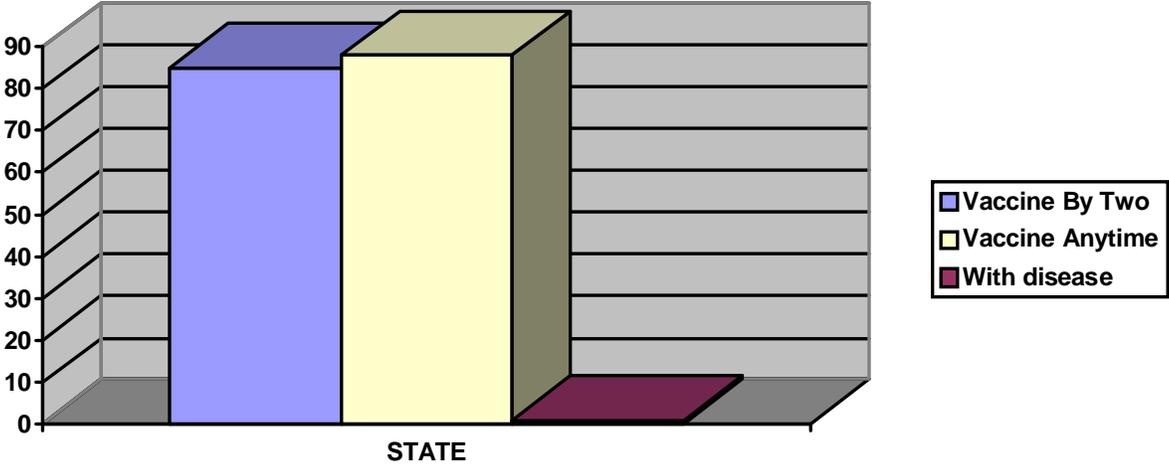


Figure 23 depicts the Varicella rate by the age of two years and the Varicella rate without the two-year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

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 54.

Table 54:
Statewide Percentage of Shots by Provider: 2003, 2004, 2005, 2006, and 2007

Provider	2003		2004		2005		2006		2007	
	Total #	%								
Public Health Dept	5,873	16.3	5,449	14.3	6,013	13.2	4,793	11.6	4,307	9.8
Private Physician	26,956	74.8	26,734	70.1	35,065	77.1	33,268	80.5	35,518	81.2
Unknown	3,205	8.9	5,966	15.6	4,407	9.7	3,256	7.9	3,916	9.0
Total	36,034	100.0	38,149	100.0	45,485	100.0	41,317	100.0	43,741	100.0

As shown in Table 54, in 2007, over 80% of the shots recorded for the sampled children were given by a private provider.

Location of Immunizations by District

Table 55 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 55:
District Specific %age of Shots by Provider 2007

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	%	# Shots Given	%	# Shots Given	%	
1-1	335	9.9	2,975	87.5	91	2.7	3,401
1-2	76	9.0	705	83.6	62	7.4	843
2-0	157	9.8	1,437	89.4	13	0.8	1,607
3-1	376	9.0	1,856	44.5	1,938	46.5	4,170
3-2	170	3.6	4,413	93.9	115	2.4	4,698
3-3	202	7.6	1,959	73.9	489	18.5	2,650
3-4	63	4.1	1,461	95.9	0	0.0	1,524
3-5	116	3.0	3,601	92.9	158	4.1	3,875
4-0	415	10.2	3,359	82.5	297	7.3	4,071
5-1	167	13.6	903	73.4	161	13.1	1,231
5-2	236	16.6	1,087	76.4	100	7.0	1,423
6-0	101	11.1	789	86.6	21	2.3	911
7-0	269	14.4	1,557	83.4	41	2.2	1,867
8-1	271	15.1	1,518	84.9	0	0.0	1,789
8-2	80	2.7	2,860	95.1	68	2.3	3,008
9-1	346	14.2	1,942	79.4	157	6.4	2,445
9-2	739	31.4	1,416	60.1	201	8.5	2,356
10-0	188	10.0	1,680	89.7	4	0.2	1,872
State	4,307	9.8	35,518	81.2	3,916	9.0	43,741

In Year Ten:

- ❖ In seventeen health districts more than 50% of the shots were given by 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 (46.5%).

- ❖ **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 (31.4%).

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 56:
Location of Immunizations by District
Four Year Comparison
2004, 2005, 2006, and 2007

District	Public Health Department				Private Physician			
	2004	2005	2006	2007	2004	2005	2006	2007
1-1	8.0	9.8	6.3	9.9	73.9	82.3	84.9	87.5
1-2	14.4	4.1	5.6	9.0	76.2	92.7	92.8	83.6
2-0	15.2	6.5	15.2	9.8	85.4	82.8	84.8	89.4
3-1	16.0	13.1	5.9	9.0	42.6	22.5	46.4	44.5
3-2	24.8	8.3	6.8	3.6	69.4	87.3	87.2	93.9
3-3	12.8	8.7	10.9	7.6	69.4	75.9	78.2	73.9
3-4	0.6	4.4	2.2	4.1	95.5	94.2	97.8	95.9
3-5	8.9	21.4	10.5	3.0	45.7	75.1	87.2	92.9
4-0	10.6	15.0	18.5	10.2	50.9	80.2	80.5	82.5
5-1	13.2	13.8	16.9	13.6	76.1	79.1	83.1	73.4
5-2	20.1	15.4	15.7	16.6	61.8	70.2	76.3	76.4
6-0	14.8	8.2	11.0	11.1	85.0	89.0	87.2	86.6
7-0	25.9	11.7	5.4	14.4	71.5	86.7	94.6	83.4
8-1	22.1	13.7	7.9	15.1	77.6	86.3	92.1	84.9
8-2	11.9	26.4	3.2	2.7	86.0	73.6	96.8	95.1
9-1	11.3	14.6	14.7	14.2	87.4	85.4	80.1	79.4
9-2	38.3	30.2	49.2	31.4	60.6	65.9	47.9	60.1
9-3	7.2	8.7	---	---	88.8	89.3	---	---
10-0	9.4	20.7	7.1	10.0	88.6	78.0	92.9	89.7
State Totals	14.3	13.2	11.6	9.8	70.1	77.1	80.5	81.2

Four-Year Comparison: Summary of Table 56:

In 2004	14.3% of the shots were received at the public health department 70.1% of the shots were given in the private sector 15.6% of the shot locations were unknown
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

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 2007 is between 76.4% and 79.6%.

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 57:
Margins of Error for 2007
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	182	82.4	+/- 5.5	76.9 – 87.9
1-2	44	93.2	+/- 7.4	85.8 – 100.6
2-0	84	94.0	+/- 5.1	88.9 – 99.1
3-1	226	77.4	+/- 5.5	71.9 – 82.9
3-2	317	59.3	+/- 5.4	53.9 – 64.7
3-3	152	69.7	+/- 7.3	62.4 – 77.0
3-4	81	92.6	+/- 5.7	86.9 – 98.3
3-5	221	77.8	+/- 5.5	72.3 – 83.3
4-0	225	78.7	+/- 5.3	73.4 – 84
5-1	66	78.8	+/- 9.9	68.9 – 88.7
5-2	78	75.6	+/- 9.5	66.1 – 85.1
6-0	47	97.9	+/- 4.1	93.8 – 102.0
7-0	105	76.2	+/- 8.1	68.1 – 84.3
8-1	95	86.3	+/- 6.9	79.4 – 93.2
8-2	165	81.2	+/- 6.0	75.2 – 87.2
9-1	140	76.4	+/- 7.0	69.4 – 83.4
9-2	129	84.5	+/- 6.2	78.3 – 90.7
10-0	104	83.7	+/- 7.1	76.6 – 90.8
Statewide Rate (weighted)	2,461	78.0	+/- 1.6	76.4 – 79.6