GEORGIA IMMUNIZATION STUDY

2005 Final Report

Georgia Department of Human Resources | Division of Public Health
Epidemiology Branch | Maternal and Child Health Section | Immunization Program
Nineteen Public Health Districts

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Acknowledgments

The Georgia Department of Human Resources, Division of Public Health, Epidemiology Branch 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, as well as, Mr. Mike Chaney, former Program Director for the Immunization Program.

2005 Executive Summary

The 2005 Immunization Study was conducted by the Georgia Department of Human Resources, Division of Public Health, Epidemiology Branch, Immunization Program and Public Health Districts. However, this study could not have been conducted without the assistance of the private providers, non-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 2005. Identifying information about the children and their parents was collected from birth certificates.

The Immunization Study showed that during 2005 most childhood immunizations (77 percent) were administered in the private sector, while County Health Departments immunized 13 percent, and the sources for 10 percent are unknown. The proportion of children in Georgia who have received all of the recommended vaccinations showed a steady increase from 16 percent in 1997 to 79 percent in 2002, a slight decrease in 2003 to 74 percent, but an increase in 2004 to 81 percent. The 2005 study results showed another slight decrease in the immunization rate at 77 percent.

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 2005, 93 percent of infants had received two doses of hepatitis B vaccine by 12 months of age, and, at 24 months, 89 percent of children had received the recommended three doses.

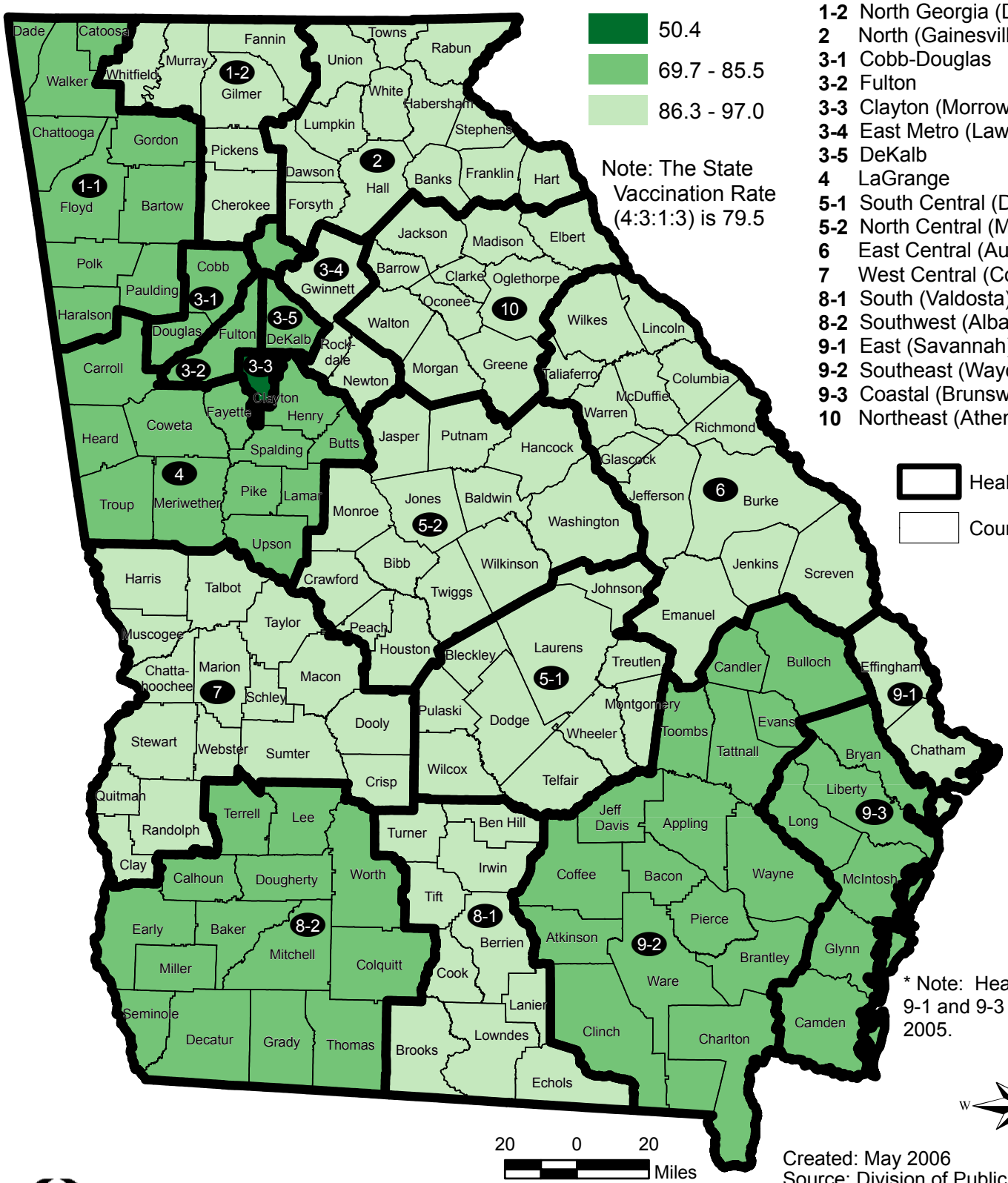
Vaccines have largely controlled diphtheria, measles, pertussis, and other scourges of the past. In 1923, with a population of less than three million, Georgia recorded 274 deaths from diphtheria, 347 deaths from measles, and 254 deaths from pertussis, while in 2003, just 80 years later, and with a population that has almost tripled, Georgia had no reported cases of tetanus or diphtheria, and just 36 cases of pertussis. In 2005, 86 percent of children 12 months of age were appropriately immunized against diphtheria, tetanus and pertussis, and 77 percent 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 53 percent in the Clayton district to 98 percent in the North (Gainesville) district. Twelve of the state's public health districts (Dalton, Gainesville, Gwinnett, Dublin, Waycross, Macon, Augusta, Columbus, Valdosta, Albany, Savannah, and Athens) succeeded in immunizing at least 85 percent of their two-year-olds against the 10 vaccine-preventable childhood diseases. Three of the state's public health districts (Fulton, Clayton, and DeKalb) had a rate less than 75

percent. Within Metropolitan Atlanta, the immunization rates varied from 53 percent in Clayton to 90 percent in Gwinnett. In Georgia outside Metropolitan Atlanta, the immunization rates ranged from 80 percent in Rome to 98 percent in the Gainesville district (see Map below).

There was minor variation in immunization status of children by the race and education of their mothers, and by whether their mothers were Medicaid recipients. Among children of white women, 85 percent were adequately immunized, while among children of black women, 74 percent were adequately immunized. Children of college-educated mothers were less likely to be adequately immunized (83 percent) than children of mothers with less than high school education (87 percent). The children of mothers who did not receive Medicaid were more likely to be adequately immunized (82 percent) than were children of mothers who did receive Medicaid (79 percent).

Georgia Vaccination Rates (4:3:1:3) by Public Health District 2005



* Note: Health Districts 9-1 and 9-3 merged in 2005.

Georgia Department of Human Resources
Division of Public Health
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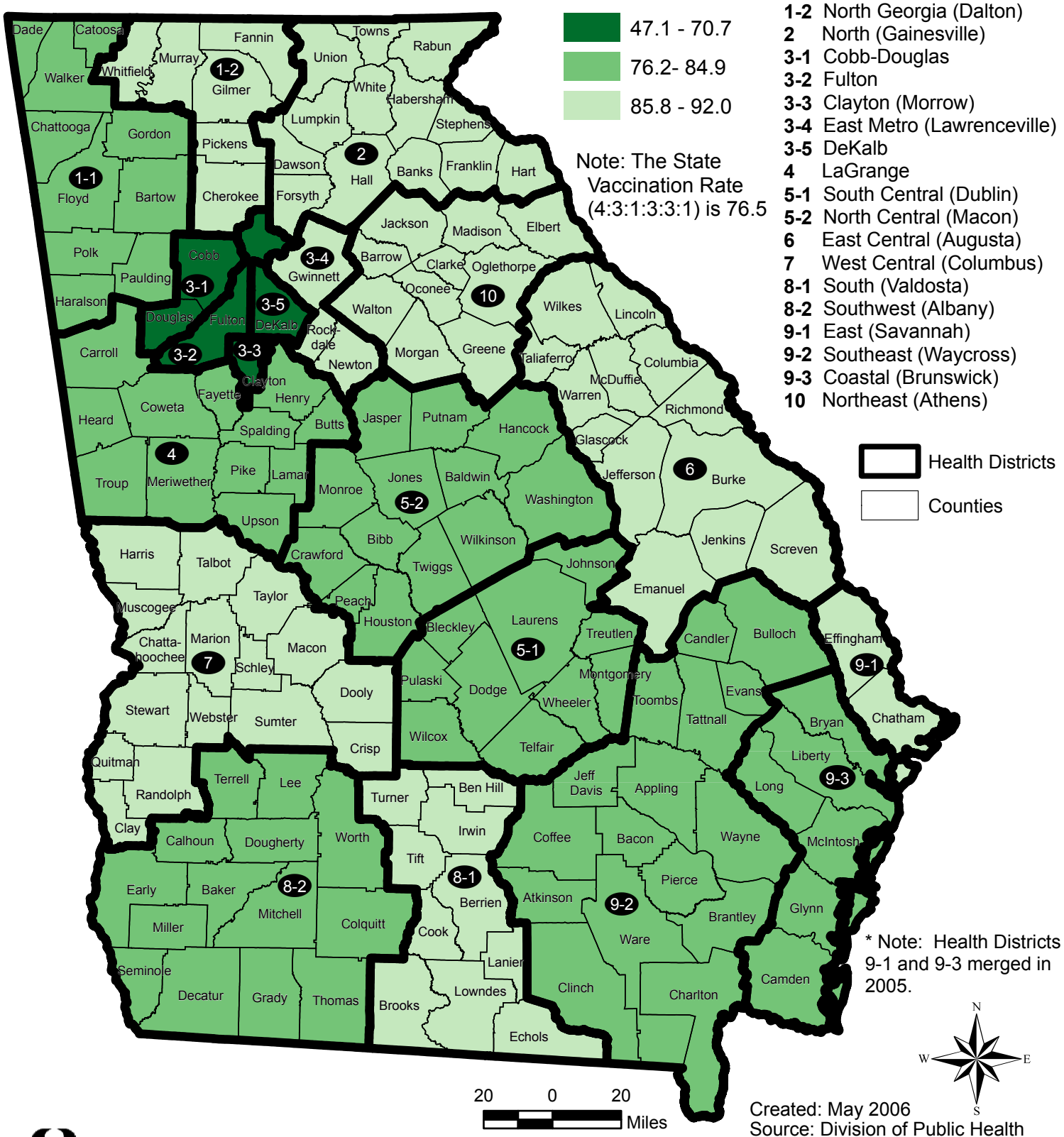
Created: May 2006
Source: Division of Public Health
Classification: Natural Breaks
Projection: Georgia Statewide Lambert Conformal Conic
Note: Map originally printed in color

Georgia Vaccination Rates (4:3:1:3:3:1) by Public Health District 2005



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SECTION I:

PROJECT OVERVIEW

SECTION I: PROJECT OVERVIEW AND INTRODUCTION

The Division of Public Health, Epidemiology Branch, Immunization Program and Health Districts collaborated on the 2005 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 nineteen health districts.

The Georgia Immunization Survey is now in its ninth year. The Rollins School of Public Health, Emory University did the first three years of the study and the Georgia Division of Public Health has continued on with the survey for the remaining six years. Immunization data for each year of the study evaluate rates for children born two years before the beginning of the study. In 2005, immunization rates for children born in January 2003 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 nineteen 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 Ms. Rebecca Thompson.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in November 2004. During December 2004, 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 2005.

* Throughout this report, we refer to study years one, two, three, four, and five as, 2001, 2002, 2003, 2004 and 2005 respectively. The results from these five study years refer to rates for 1999, 2000, 2001, 2002, and 2003 respectively.

During January, a training session for the public health representatives was held via conference call. Data were collected from February 2005 through September 2005. The Project Coordinator and Assistant Project Coordinator served as the contact person for the public health representatives during the data collection period. Conference calls were held monthly 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
Original, stratified sample drawn	December, 2004
Initial notification of public health community Immunization Coordinators Health Directors	December, 2004
Initial notification of private health community	January, 2005
Conference call training for public health representatives	January, 2005
Data collection period	February – September, 2005
Data entry period	March – November, 2005
Double data entry of 5% of data forms	November, 2005
Final data cleaning and analysis of data	December, 2005
Final Report	March, 2006

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

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Research Design

The ninth 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 2003. 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 2005. Identifying information about the children and their parents was collected from birth certificates.

Target and Sample Populations

The target population of the ninth year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 2003. A sample size of 3,322 children born in the month of January 2003 was selected for the study. The sample design allowed for independent estimates for each of the 19 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 2003. 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 2005. 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 Branch, 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 November 2005. 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 97.0% 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

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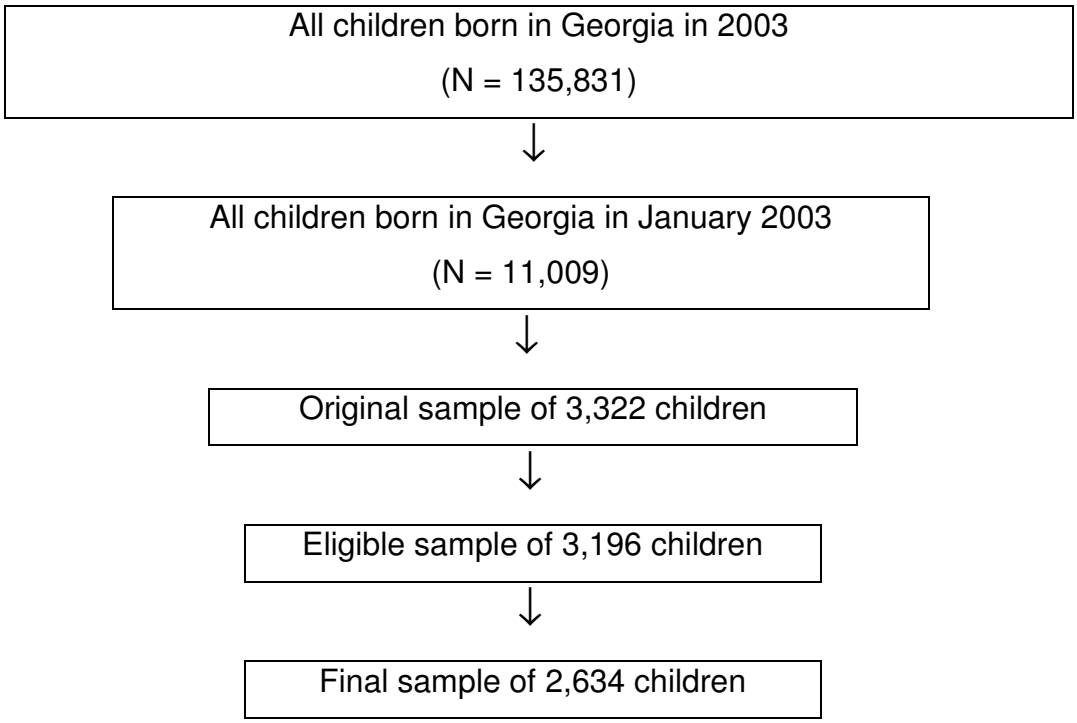
Sampling

The sample of 3,322 children was drawn from 11,009 children born in Georgia in January 2003. A total of 135,831 children were born in Georgia during 2003.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 3,196. (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 3,196 children in the eligible sample, 2,634 children were located, 494 children never were located and 68 parental refusals were removed. The resulting final sample consisted of 2,645 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 2,634 children represented over 82 percent of the eligible sample.

Table 2:

Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	**3,322**	**100.0%**
Deceased	3	0.1%
Adopted	11	0.3%
Moved out of state	87	2.6%
Military	25	0.8%
Eligible Sample	**3,196**	96.2%
Eligible Sample	**3,196**	**100.0%**
Records Not Located /Eligibility Unknown *	562	17.6%
Final Sample (Located Records)**	**2,634**	82.4%

* **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=105] 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 2005 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 65.2 percent to a high of 99.3 percent, with a statewide average response rate of 84.5 percent.

Table 3:

2005 Eligible Sample, Number Located and Response Rates by District

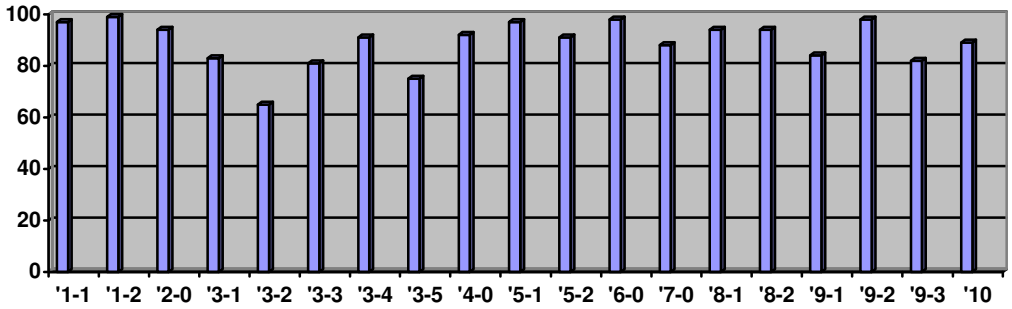
Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	173	167	96.5%
1-2	140	139	99.3%
2-0	50	47	94.0%
3-1	239	198	82.8%
3-2	538	353	65.6%
3-3	301	244	81.1%
3-4	103	94	91.3%
3-5	311	232	74.6%
4-0	247	226	91.5%
5-1	78	76	97.4%
5-2	160	146	91.3%
6-0	119	116	97.5%
7-0	129	113	87.6%
8-1	96	90	93.8%
8-2	66	62	93.9%
9-1	64	54	84.4%
9-2	168	164	97.6%
9-3	140	115	82.1%
10-0	74	66	89.2%
State	**3,196**	**2,702**	**84.5%**

*sample includes parental refusals

**number located / eligible sample

Figure 2

2005 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 2005 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	167	3	0.02
1-2	139	5	0.04
2-0	47	1	0.02
3-1	198	3	0.02
3-2	351	36	0.10
3-3	244	0	0.00
3-4	94	2	0.02
3-5	232	1	0.004
4-0	226	2	0.009
5-1	76	1	0.01
5-2	146	7	0.05
6-0	116	1	0.008
7-0	113	0	0.00
8-1	90	2	0.02
8-2	62	0	0.00
9-1	54	0	0.00
9-2	164	0	0.00
9-3	115	0	0.00
10-0	66	4	0.06
Total	**2,700**	**68**	**0.03**

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 involved only the final sample of 2,634 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" 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
- "4:3:1" status: — used most frequently throughout the study, referring to the more traditional standard of immunization status -- a child who has received four DTP/DTaP, three OPV/IPV, and one MMR vaccination
- "3:3:1" status: — used infrequently in this study - refers to a child who has received three DTP/DTaP, three OPV/IPV, and one MMR vaccination

Table 5 illustrates the percent of the children in the final samples in the last four 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 2,634 children who were located in 2005, 76.5 percent were adequately immunized at the 4:3:1:3:3:1 level. This percent of adequately immunized children decreased from 81.3 percent in 2004.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
2001	1,837	66.7	918	33.3
2002	2,146	78.9	575	21.1
2003	1,906	74.3	661	25.7
2004	2,150	81.3	495	18.7
2005	2,015	76.5	619	23.5

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

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

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
2005	2,095	79.5	539	20.5

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

Table 7 illustrates the percent of the children in the final sample who were adequately immunized with the 4:3:1 series compared to the children in the final sample who were not adequately immunized with this series. During the 2005 assessment, the number of adequately immunized children decreased to 80.7 percent.

Table 7:
4:3:1 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
2001	2,068	75.1	687	24.9
2002	2,284	83.9	437	16.1
2003	2,075	80.8	492	19.2
2004	2,252	85.1	393	14.9
2005	2,126	80.7	508	19.3

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

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

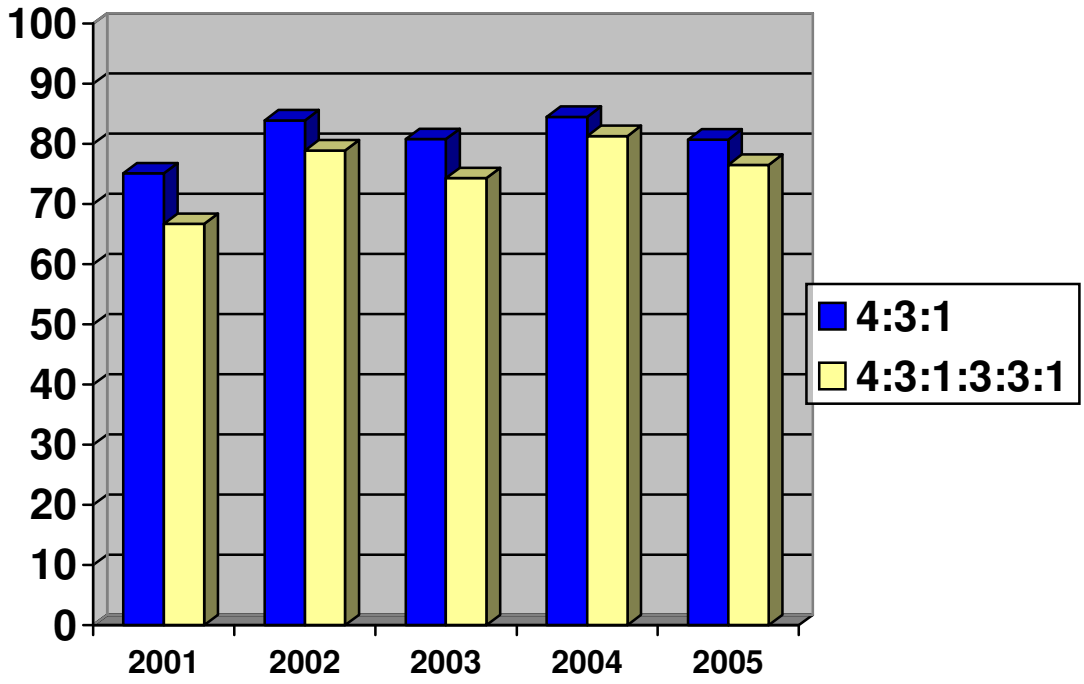


Figure 3 reveals the statewide 4:3:1 coverage rates for the 2001, 2002, 2003, 2004 and 2005 studies. The figure also shows statewide 4:3:1:3:3:1 vaccination coverage for the 2001, 2002, 2003, 2004 and 2005 studies.

The 3:3:1 immunization coverage rates allow for three DTP/DTaP instead of four DTP/DTaP. The number of OPV/IPV and MMR vaccinations remain the same. Table 8 indicates the 3:3:1 immunization coverage rate for the state has varied during the 2001 to 2005 study years.

Table 8:
3:3:1 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
2001	2,175	78.9	580	21.1
2002	2,417	88.8	304	11.2
2003	2,205	85.9	362	14.2
2004	2,340	88.5	305	11.5
2005	2,219	84.2	415	15.8

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

The statewide immunization status for each individual vaccine series is located in Table 9. This table illustrates the number and percent of children who were adequately immunized with each of the recommended vaccines. Vaccines which are part of the 4:3:1:3:3:1 shot series are shown here. In 2001 none of the immunization rates met the state goal of 90 percent coverage; however, during the 2002 assessment nearly all vaccines were at or above the state goal of 90 percent coverage. In 2003, coverage rates decreased slightly, but still showed over 90 percent coverage for 3 DTP/DtaP vaccine series. In 2004, all but one of the vaccine series met the coverage rate of 90 percent. Coverage levels for 2005 have decreased slightly, but still show most of the vaccines are near the 90

percent coverage rate with the 3 DTP/DtaP above 90 percent. (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 9:

State Immunization Status by Vaccine Series by Study Year*

Vaccine	2001		2002		2003		2004		2005	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
3 DTP/DTaP	2,392	86.8	2,561	94.1	2,340	91.2	2,459	93.0	2,428	92.2
4 DTP/DTaP	2,093	76.0	2,303	84.6	2,096	81.7	2,268	85.7	2,169	82.3
3 OPV/IPV	2,226	80.8	2,466	90.6	2,251	87.7	2,401	90.8	2,315	87.9
1 MMR	2,258	82.0	2,474	90.9	2,266	88.3	2,405	90.9	2,296	87.2
3 Hib	2,322	84.3	2,474	90.9	2,242	87.3	2,387	90.2	2,306	87.5
3 Hep B	2,308	83.8	2,471	90.8	2,255	87.8	2,400	90.7	2,337	88.7
1 Varicella	2,147	77.9	2,407	88.5	2,101	81.8	2,378	89.9	2,302	87.4
3 PCV	---	---	---	---	---	---	1,262	47.7	2,080	79.0
4 PCV	---	---	---	---	---	---	485	18.3	1,024	38.9

Note: State rates based on data weighted by health district.
* PCV data not collected before 2004.

In addition to looking 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 10 provides an overview of the immunization status of the children in the final sample of the 2001, 2002, 2003, 2004 and 2005 studies at one year of age, looking at coverage status by individual doses of vaccine.

Table 10:
Statewide Immunization Status by Individual Vaccines at 12 Months of Age

Vaccine	Number 2001	Percent* 2001	Number 2002	Percent* 2002	Number 2003	Percent* 2003	Number 2004	Percent* 2004	Number 2005	Percent* 2005
DTP/DTaP1	2,507	91.0%	2,667	98.0%	2,447	95.3%	2,554	96.6%	2,545	96.6%
DTP/DTaP2	2,426	88.1%	2,592	95.3%	2,367	92.2%	2,472	93.5%	2,451	93.1%
DTP/DTaP3	2,214	80.4%	2,394	88.0%	2,176	84.8%	2,255	85.3%	2,253	85.5%
DTP/DTaP4	12	0.4%	23	0.8%	8	0.3%	26	1.0%	25	0.9%
DTP/DTaP5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
OPV/IPV1	2,504	90.9%	2,662	97.8%	2,442	95.1%	2,553	96.5%	2,541	96.5%
OPV/IPV2	2,412	87.5%	2,581	94.9%	2,350	91.5%	2,458	92.9%	2,433	92.4%
OPV/IPV3	601	21.8%	948	34.8%	1,004	39.1%	1,132	42.8%	1,275	48.4%
OPV/IPV4	1	0.0%	2	0.1%	3	0.1%	5	0.2%	9	0.3%
MMR1**	87	3.2%	34	1.2%	92	3.6%	110	4.2%	96	3.6%
MMR2	0	0.0%	1	0.0%	1	0.0%	0	0.0%	1	0.0%
HIB1	2,492	90.5%	2,651	97.4%	2,436	94.9%	2,541	96.1%	2,531	96.1%
HIB2	2,398	87.0%	2,569	94.4%	2,345	91.4%	2,446	92.5%	2,407	91.4%
HIB3	1,720	62.4%	1,267	46.6%	1,110	43.2%	1,063	40.2%	955	36.3%
HIB4	27	1.0%	15	0.6%	16	0.6%	25	0.9%	32	1.2%
HIB5	1	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.0%
HEPB1	2,508	91.0%	2,649	97.4%	2,440	95.1%	2,551	96.4%	2,549	96.8%
HEPB2	2,449	88.9%	2,542	93.4%	2,346	91.4%	2,478	93.7%	2,463	93.5%
HEPB3	1,803	65.4%	1,116	41.0%	1,264	49.2%	1,229	46.5%	1,342	50.9%
HEPB4	14	0.5%	17	0.6%	19	0.7%	26	1.0%	92	3.5%
VAR1**	118	4.3%	44	1.6%	125	4.9%	136	5.1%	115	4.4%
VAR2	0	0.0%	0	0.0%	1	0.0%	0	0.0%	1	0.0%
PCV1	---	---	---	---	---	---	---	---	2,359	89.6%
PCV2	---	---	---	---	---	---	---	---	2,209	83.9%
PCV3	---	---	---	---	---	---	---	---	1,796	68.2%
PCV4	---	---	---	---	---	---	---	---	25	2.1%

*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 2001 study = 2,755; 2002 study = 2,721; 2003 study = 2,567; 2004 study = 2, 645; 2005 study = 2,634.

Table 11 shows the 2001, 2002, 2003, 2004 and 2005 4:3:1 immunization coverage rates and percents for each of the 19 health districts in the state. *(For more detailed information on immunization rates specific to health districts, see Section IV: Results of District Level Analyses)* The margin of error indicates the confidence limits surrounding the immunization rates. The 2005 margin of error for each health district ranges from +/- 2.9 percent to +/- 9.0 percent. The District level 2005 4:3:1 immunization rates range from 53.3 percent to 97.8 percent. Of the 19 health districts, eight had an immunization coverage rate over 90 percent and seven districts had 2005 coverage rates between 80 and 90 percent. The following summary highlights the changes in 4:3:1 coverage rates between 2004 and 2005:

- Coverage increased between 0 and 5 percent in seven districts (District 3-1, 4-0, 5-2, 6-0, 7-0, 8-1 and 9-2)
- Coverage increased between 5 and 20 percent in two districts (Districts 1-2 and 5-1)
- Coverage fell between 0 and 5 percent in five districts (Districts 1-1, 2-0, 3-4, 9-3 and 10-0)
- Coverage fell between 5 and 20 percent in five districts (Districts 3-2, 3-3, 3-5, 8-2 and 9-1)

Table 11:
4:3:1 District and State Coverage Rates by Study Year

Dist	2001		2002		2003		2004		2005	
	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error
1-1	78.9	+/-6.2	80.6	+/-5.5	77.5	+/-6.7	82.6	+/- 5.0	79.5	+/- 5.7
1-2	78.1	+/-6.7	79.1	+/-6.3	85.6	+/-5.6	88.2	+/- 6.3	97.0	+/- 2.9
2-0	94.8	+/-3.7	93.4	+/-5.6	94.7	+/-4.5	100	+/- 0	97.8	+/- 4.2
3-1	70.7	+/-6.8	84.5	+/-4.2	75.2	+/-7.0	73.1	+/- 6.0	75.9	+/- 6.0
3-2	42.4	+/-5.6	82.6	+/-6.2	68.1	+/-7.8	78.3	+/- 5.4	72.6	+/- 4.9
3-3	57.6	+/-8.9	73.9	+/-8.2	78.4	+/-4.9	65.1	+/- 10.0	53.3	+/- 6.3
3-4	75.9	+/-9.4	94.3	+/-3.4	90.0	+/-7.6	93.5	+/- 3.3	90.2	+/- 6.1
3-5	75.5	+/-6.0	84.6	+/-5.1	66.0	+/-7.6	82.0	+/- 4.9	72.3	+/- 5.8
4-0	83.5	+/-5.1	87.1	+/-5.4	83.6	+/-6.9	77.5	+/- 6.0	81.6	+/- 5.1
5-1	85.0	+/-9.0	80.8	+/-8.7	93.3	+/-5.2	85.5	+/- 9.3	94.7	+/- 5.1
5-2	69.1	+/-8.6	84.7	+/-4.5	83.3	+/-6.5	87.1	+/- 6.0	87.8	+/- 5.4
6-0	88.9	+/-4.8	89.2	+/-6.0	86.2	+/-6.1	90.5	+/- 5.3	93.9	+/- 4.4
7-0	73.1	+/-6.7	82.8	+/-6.9	76.4	+/-7.0	88.4	+/- 4.4	90.3	+/- 5.4
8-1	76.7	+/-8.2	82.2	+/-6.6	91.9	+/-4.8	89.5	+/- 6.9	94.3	+/- 4.8
8-2	93.2	+/-4.3	83.1	+/-8.4	74.0	+/-7.0	94.9	+/- 3.3	85.5	+/- 8.8
9-1	69.1	+/-8.2	80.9	+/-6.2	77.3	+/-6.7	97.5	+/- 3.4	87.0	+/- 9.0
9-2	90.8	+/-4.9	85.4	+/-7.3	81.2	+/-6.5	82.2	+/- 6.5	85.4	+/- 5.4
9-3	71.6	+/-9.1	85.6	+/-6.3	81.9	+/-7.8	83.1	+/- 8.1	82.6	+/- 7.0
10-0	84.4	+/-5.7	80.2	+/-7.1	90.7	+/-4.5	94.3	+/- 4.8	93.5	+/- 6.1
State	**75.1**	**+/-1.5**	**83.9**	**+/-1.6**	**80.8**	**+/-1.6**	**85.1**	**+/-1.6**	**80.7**	**+/-1.6**

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

Additional information regarding 3:3:1 and 4:3:1:3:3:1 coverage rates and margins of error by district can be found in Appendix F: Margins of Error for Immunization Coverage Rates.

Tables 12-18 present the state and district rates for each individual vaccine during the 2001, 2002, 2003, 2004 and 2005 data collection periods.

As shown in Table 12, 2004 district immunization rates for the DTP/DTaP vaccines ranged from 58.6 percent to 97.8 percent, with a statewide rate of 82.3 percent receiving all four doses. The 2005 statewide DTP/DTaP rate decreased slightly from the 2004 study year.

Table 12:
State and District Immunization Rates for DTP/DTaP by Study Year

District	2001 Rates 4 DTP/DTaP	2002 Rates 4 DTP/DTaP	2003 Rates 4 DTP/DTaP	2004 Rates 4 DTP/DTaP	2005 Rates 4 DTP/DTaP
1-1	79.5%	81.1%	77.1%	85.3%	82.3%
1-2	79.5%	82.3%	86.3%	88.2%	97.8%
2-0	94.8%	94.7%	95.7%	100%	97.8%
3-1	70.7%	84.9%	76.6%	78.8%	79.0%
3-2	42.4%	84.0%	68.1%	78.8%	73.8%
3-3	61.0%	73.9%	79.1%	67.4%	58.6%
3-4	75.9%	94.9%	90.0%	94.1%	92.4%
3-5	77.0%	84.6%	66.0%	82.4%	74.0%
4-0	83.5%	87.8%	84.5%	79.1%	83.9%
5-1	86.7%	80.8%	93.3%	85.5%	94.7%
5-2	72.7%	85.5%	84.9%	87.1%	88.5%
6-0	89.5%	89.2%	87.8%	90.5%	94.8%
7-0	74.3%	83.6%	77.1%	88.4%	90.3%
8-1	77.7%	82.2%	91.9%	89.5%	94.3%
8-2	94.7%	85.7%	75.3%	94.9%	87.1%
9-1	69.9%	81.6%	77.3%	97.5%	87.0%
9-2	92.4%	86.5%	82.6%	83.0%	86.0%
9-3	71.6%	85.6%	83.0%	83.1%	82.6%
10-0	85.1%	80.2%	93.2%	94.3%	93.5%
State	**76.0%**	**84.6%**	**81.7%**	**85.7%**	**82.3%**

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

Table 13 shows the 2001, 2002, 2003, 2004 and 2005 state and district rates for the OPV/IPV vaccines. The 2005 district coverage rates for these vaccines varied between 68.4 percent and 98.5 percent. The 2005 statewide immunization rate for OPV/IPV was 87.9 percent, which is slightly lower than the previous year's study rate.

Table 13:
State and District Immunization Rates for OPV/IPV by Study Year

District	2001 Rates 3 OPV/IPV	2002 Rates 3 OPV/IPV	2003 Rates 3 OPV/IPV	2004 Rates 3 OPV/IPV	2005 Rates 3 OPV/IPV
1-1	88.6%	90.0%	84.8%	89.9%	89.0%
1-2	86.3%	85.4%	88.9%	92.2%	98.5%
2-0	97.0%	97.4%	94.7%	100%	97.8%
3-1	75.3%	90.8%	83.4%	83.5%	86.2%
3-2	45.5%	84.7%	71.7%	85.0%	81.1%
3-3	69.5%	82.9%	85.8%	74.4%	68.4%
3-4	77.2%	96.0%	90.0%	96.1%	90.2%
3-5	83.7%	88.7%	82.0%	89.5%	83.1%
4-0	86.4%	92.5%	92.7%	85.6%	87.1%
5-1	93.3%	96.2%	97.8%	92.7%	96.0%
5-2	81.8%	94.0%	93.7%	93.2%	94.2%
6-0	93.2%	95.1%	91.9%	94.8%	97.4%
7-0	78.4%	90.5%	85.0%	93.5%	92.9%
8-1	84.5%	95.1%	96.0%	96.1%	97.7%
8-2	96.2%	90.9%	80.7%	97.7%	91.9%
9-1	79.7%	90.1%	88.7%	98.8%	94.4%
9-2	92.4%	92.1%	88.4%	90.4%	93.3%
9-3	76.8%	89.8%	89.4%	88.0%	88.7%
10-0	88.3%	86.0%	93.2%	98.9%	98.4%
State	**80.8%**	**90.6%**	**87.7%**	**90.8%**	**87.9%**

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

Table 14 shows the 2001, 2002, 2003, 2004 and 2005 state and district rates for MMR. The 2005 district rates for MMR ranged from a low of 65.6 percent to a high of 100.0 percent, with a statewide rate of 98.4 percent coverage. The 2005 statewide rate for the MMR vaccine decreased slightly from the 2004 rate of 90.9 percent.

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

District	2001 Rates 1 MMR	2002 Rates 1 MMR	2003 Rates 1 MMR	2004 Rates 1 MMR	2005 Rates 1 MMR
1-1	89.2%	90.5%	88.1%	91.3%	87.8%
1-2	85.6%	87.3%	90.8%	94.1%	97.8%
2-0	97.0%	96.1%	96.8%	100%	97.8%
3-1	77.0%	90.1%	80.7%	86.3%	82.1%
3-2	45.1%	84.7%	71.0%	82.7%	80.4%
3-3	74.6%	84.7%	85.1%	75.6%	65.6%
3-4	83.5%	97.1%	90.0%	96.1%	91.3%
3-5	87.8%	86.7%	80.7%	90.8%	84.8%
4-0	86.4%	93.2%	92.7%	85.0%	89.3%
5-1	91.7%	97.4%	97.8%	90.9%	96.0%
5-2	82.7%	92.3%	96.8%	93.2%	92.1%
6-0	95.1%	96.1%	91.9%	95.7%	94.8%
7-0	80.2%	92.2%	87.9%	93.0%	93.8%
8-1	82.5%	93.8%	95.2%	92.1%	97.7%
8-2	97.0%	90.9%	81.3%	97.7%	93.5%
9-1	79.7%	89.5%	90.0%	98.8%	92.6%
9-2	93.1%	94.4%	90.6%	89.6%	92.1%
9-3	80.0%	87.3%	89.4%	89.2%	87.0%
10-0	89.6%	90.1%	93.8%	97.7%	98.4%
State	**82.0%**	**90.9%**	**88.3%**	**90.9%**	**87.2%**

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

As shown in Table 15, 2005 district immunization rates for the Hib vaccine varied between 71.7 and 98.4 percent. The statewide Hib coverage rate in 2005 was 87.5 percent, a slight decrease from the 2004 statewide rate of 90.2 percent.

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

District	2001 Rates 3 Hib	2002 Rates 3 Hib	2003 Rates 3 Hib	2004 Rates 3 Hib	2005 Rates 3 Hib
1-1	89.2%	91.5%	84.1%	90.8%	87.2%
1-2	95.2%	86.1%	90.8%	94.1%	97.8%
2-0	96.3%	96.1%	93.6%	100%	95.7%
3-1	83.9%	91.2%	82.1%	82.1%	84.1%
3-2	45.5%	85.4%	72.5%	84.1%	81.4%
3-3	81.4%	80.2%	88.4%	76.7%	71.7%
3-4	92.4%	96.6%	90.0%	96.7%	92.4%
3-5	89.3%	86.2%	76.0%	88.3%	82.3%
4-0	88.3%	93.2%	87.3%	86.6%	88.8%
5-1	91.7%	97.4%	97.8%	87.3%	96.0%
5-2	84.5%	92.7%	91.3%	91.2%	90.6%
6-0	97.5%	97.1%	93.5%	92.2%	94.8%
7-0	82.6%	89.7%	85.7%	93.0%	91.2%
8-1	81.6%	94.6%	95.2%	94.7%	96.6%
8-2	92.5%	92.2%	81.3%	98.3%	93.5%
9-1	81.3%	90.8%	87.3%	98.8%	94.4%
9-2	95.4%	93.3%	86.2%	91.1%	91.5%
9-3	81.1%	91.5%	89.4%	84.3%	88.7%
10-0	94.2%	86.8%	95.7%	95.5%	98.4%
State	**84.3%**	**90.9%**	**87.3%**	**90.2%**	**87.5%**

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

Table 16 reports the statewide and district immunization coverage rates for the Hepatitis B vaccine. In 2005, the district coverage rates varied from a low of 75.0 percent to 98.5 percent. The 2005 statewide rate of 88.7 percent for the Hepatitis B vaccine was lower than the 2004 statewide rate of 90.7 percent.

Table 16:
State and District Immunization Rates for Hep B by Study Year

District	2001 Rates 3 Hep B	2002 Rates 3 Hep B	2003 Rates 3 Hep B	2004 Rates 3 Hep B	2005 Rates 3 Hep B
1-1	92.8%	91.0%	83.4%	90.8%	89.0%
1-2	93.2%	87.3%	90.8%	94.1%	98.5%
2-0	95.6%	97.4%	93.6%	98.5%	93.5%
3-1	82.8%	92.6%	86.2%	83.0%	83.6%
3-2	44.4%	84.7%	74.6%	85.4%	81.1%
3-3	81.4%	80.2%	88.8%	77.9%	75.0%
3-4	86.1%	94.9%	90.0%	96.7%	91.3%
3-5	88.8%	85.6%	78.0%	89.1%	82.3%
4-0	88.8%	92.5%	92.7%	86.1%	90.2%
5-1	93.3%	96.2%	96.7%	90.9%	96.0%
5-2	83.6%	93.1%	93.7%	91.8%	92.1%
6-0	93.2%	96.1%	95.1%	94.0%	95.7%
7-0	85.0%	90.5%	87.9%	93.5%	93.8%
8-1	84.5%	94.6%	96.0%	96.1%	97.7%
8-2	95.5%	92.2%	82.0%	97.7%	98.4%
9-1	76.4%	90.1%	79.3%	100%	96.3%
9-2	95.4%	92.1%	87.7%	90.4%	95.7%
9-3	81.1%	89.0%	86.2%	86.7%	90.4%
10-0	91.6%	88.4%	95.1%	94.3%	98.4%
State	**83.8%**	**90.8%**	**87.8%**	**90.7%**	**88.7%**

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

Table 17 reports Varicella coverage rates among the 19 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 67.2 percent to 98.4 percent, with a statewide coverage rate of 87.4 percent for the Varicella vaccine. This is a slight decrease from the 2004 Varicella rate of 89.9 percent.

Table 17:
State and District Immunization Rates for Varicella by Study Year

District	2001 Rates 1 Varicella	2002 Rates 1 Varicella	2003 Rates 1 Varicella	2004 Rates 1 Varicella	2005 Rates 1 Varicella
1-1	83.7%	89.1%	86.8%	89.0%	87.2%
1-2	82.9%	86.1%	90.2%	95.1%	97.8%
2-0	94.8%	96.1%	96.8%	98.5%	97.8%
3-1	72.4%	88.4%	80.7%	83.5%	82.6%
3-2	44.4%	81.9%	71.7%	81.4%	78.5%
3-3	69.5%	82.9%	84.7%	74.4%	67.2%
3-4	86.1%	96.0%	90.0%	94.1%	92.4%
3-5	81.1%	83.6%	74.0%	89.5%	85.7%
4-0	83.0%	92.5%	92.7%	85.0%	89.7%
5-1	86.7%	84.6%	95.6%	90.9%	97.3%
5-2	80.0%	90.3%	92.9%	91.2%	92.8%
6-0	88.3%	97.1%	90.2%	94.8%	93.9%
7-0	74.9%	88.8%	85.7%	93.5%	93.8%
8-1	78.6%	93.0%	94.4%	92.1%	96.6%
8-2	96.2%	90.9%	78.0%	97.7%	93.5%
9-1	71.5%	83.6%	83.3%	98.8%	94.4%
9-2	88.5%	87.6%	91.3%	90.4%	93.3%
9-3	69.5%	83.9%	86.2%	88.0%	87.8%
10-0	87.0%	86.8%	95.7%	94.3%	98.4%
State	**77.9%**	**88.5%**	**86.7%**	**89.9%**	**87.4%**

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

Table 18 reports the statewide and district immunization coverage rates for the PCV vaccine. In 2005, the district coverage rates varied from a low of 62.7 percent to 95.7 percent.

Table 18:
State and District Immunization Rates for PCV by Study Year

District	2005 Rates 3 PCV
1-1	81.1%
1-2	95.5%
2-0	95.7%
3-1	82.1%
3-2	79.8%
3-3	62.7%
3-4	90.2%
3-5	73.2%
4-0	78.1%
5-1	82.7%
5-2	69.1%
6-0	90.4%
7-0	67.3%
8-1	88.6%
8-2	85.5%
9-1	75.9%
9-2	79.3%
9-3	73.9%
10-0	91.9%
State	**79.0%**

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

Statewide Comparisons of Maternal Demographics of Adequately Immunized Children

Cross-tabulations were performed at the state level in order to describe the relationship between maternal characteristics and the immunization status of two-year-old children. Tables 19-21 provide some of the characteristics of mothers of children who were up-to-date on their 4:3:1 series. Analyses include cross-tabulations of 4:3:1 complete children and total children in each group with the following three variables: maternal race, maternal education, and maternal Medicaid status. Differences between groups are significant if the p-value is less than 0.05.

Table 19 contains statewide cross-tabulations of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals who fall into each category by race and adequacy of immunization. The bottom row represents the percent of each race that falls into that specific category. The table shows that for the 2001 and 2002 study years the immunization rates of children born to black and white mothers were virtually the same. However, in the 2003, 2004, and 2005 study years maternal race was a significant factor in the immunization status of two-year-old children in Georgia.

Table 19:
Statewide Cross tabulations of
Maternal Race and Child Immunization Status by Study Year

	2001 4:3:1 Adequate	**2002 4:3:1 Adequate**	**2003 4:3:1 Adequate**	**2004 4:3:1 Adequate**	**2005 4:3:1 Adequate**
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	1265/1661 (76.2)	1410/1664 (84.7)	1221/1560 (78.3)	1377/1587 (86.8)	1296/1529 (84.8)
Black	765/1045 (73.2)	806/978 (82.4)	661/940 (70.3)	800/977 (81.9)	703/949 (74.1)
Other	38/49 (77.6)	64/79 (81.0)	53/67 (79.1)	75/81 (92.6)	69/91 (75.8)
4:3:1 Total	75.1%	83.9%	80.8%	85.1%	80.7%

Notes: Total rates based on data weighted by health district.
2001 Chi-square=3.15, p=0.21; 2002 Chi-square=3.81, p=0.28; 2003 Chi-square=20.49, p<.05; 2004 Chi-square=15.07, p=<.05; 2005 Chi-square=43.88, p=<.05.

Table 20 shows the statewide cross-tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group according to the immunization status of their children. The bottom row represents the percent of the total number in that category. In 2002 and 2003 maternal educational attainment was associated with child immunization status. As the mother's education level increased, the child's immunization rate increased as well. During the other study years shown in Table 20, childhood immunization status varied with maternal educational attainment.

Table 20:
Statewide Cross tabulations of Maternal Educational Attainment and Child Immunization Status by Study Year

	2001 4:3:1 Adequate	**2002 4:3:1 Adequate**	**2003 4:3:1 Adequate**	**2004 4:3:1 Adequate**	**2005 4:3:1 Adequate**
Education	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	161/221 (72.9)	124/157 (79.0)	25/33 (75.8)	28/32 (87.5)	131/151 (86.8)
Some high school	456/595 (76.6)	455/561 (81.1)	297/408 (72.8)	360/428 (84.1)	276/355 (77.7)
High school	724/960 (75.4)	752/914 (82.3)	619/856 (72.1)	687/816 (84.2)	621/771 (80.5)
Some college	364/485 (75.1)	415/498 (83.3)	380/495 (76.8)	438/523 (83.7)	418/539 (77.6)
College or higher	363/494 (73.5)	538/591 (91.0)	614/775 (79.2)	739/846 (87.4)	680/818 (83.1)
4:3:1 Total	75.1%	83.9%	80.8%	85.1%	80.7%

Notes: Total rates based on data weighted by health district.
2001 Chi-square=2.09, p=0.7; 2002 Chi-square=31.97, p<0.05; 2003 Chi –square=12.50, p<.05; 2004 Chi-square=5.15, p=0.27; 2005 Chi-square=12.09, p<0.05.

Table 21 shows the statewide cross-tabulation of maternal Medicaid status and 4:3:1 immunization status for 2002, 2003, 2004 and 2005 study years. The 4:3:1 rates are shown for Medicaid recipients and non-Medicaid recipients. During the 2002, 2003, and 2004 study years, statewide immunization rates were significantly higher for Non-Medicaid recipients (Chi-square=15.34, p=0.00009 and Chi-square=17.45, p < .05, respectively). In the 2005 study year, statewide immunization rates were similar for Medicaid and non-Medicaid recipients.

Table 21:
2004 Statewide Cross tabulations
of Maternal Medicaid Status and Child Immunization Status

	2002 4:3:1 Adequate	**2003 4:3:1 Adequate**	**2004 4:3:1 Adequate**	**2005 4:3:1 Adequate**
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	1,054/1,300 (81.1)	991/1,375 (72.1)	1,203/1,440 (83.5)	1,070/1,348 (79.4)
Non-Medicaid	1,230/1,421 (86.6)	944/1,192 (79.2)	1,049/1,205 (87.1)	1,056/1,286 (82.1)
4:3:1 Total	83.9%	80.8%	85.1%	80.7%

Notes: 4:3:1 total rates based on data weighted by health district.
2002 Chi-square = 15.13, p<0.05; 2003 Chi-square = 17.45, p <.05; 2004 Chi-square = 6.40, p <.05; 2005 Chi-square = 3.17, p=.08.

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 coverage, and 3:3:1 coverage.

In reviewing rates at the most commonly used level of coverage, 4:3:1 coverage, immunization rates decreased in 2005 statewide compared to the same rates as measured by this study in 2004.

SECTION IV:

RESULTS OF DISTRICT LEVEL ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

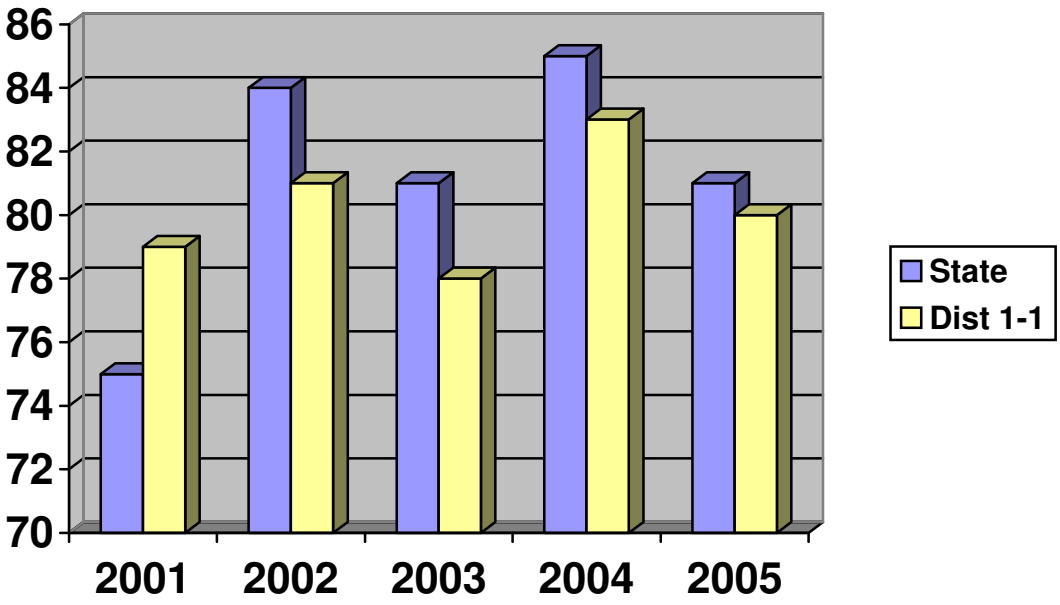
The immunization rates for this sixth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: Response Rates for the 2005 Georgia Immunization Study. 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 10-16. The Individual District Reports include immunization rates for each recommended vaccine and 4:3:1 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 173 children born in January 2003. From the 173 children, 167 records were located (Response Rate=96.5%). Of the 167 located records, there were 3 parental refusals leaving a final sample of 164 records.

- **The 4:3:1 immunization coverage estimate is 79.9 percent (131/164).** This rate is slightly lower than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 78.0 percent (128/164).** This rate is slightly lower than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 76.2 percent (125/164).** This rate is nearly equal to the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 22:

District Immunization Rates for Health District 1-1 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	79.5%	81.1%	77.5%	85.3%	79.5%
3 OPV/IPV	88.6%	90.0%	84.8%	89.9%	88.8%
1 MMR	89.2%	90.5%	88.1%	91.3%	87.6%
3 Hib	89.2%	91.5%	84.1%	90.8%	87.0%
3 HepB	92.8%	91.0%	83.4%	90.8%	88.8%
1 Varicella	83.7%	89.1%	86.8%	89.0%	87.0%
3 PCV	---	---	---	51.4%	82.0%
4 PCV	---	---	---	15.6%	44.1%

*PCV data not collected before 2004.

Table 22 reveals the coverage rates of each vaccine series. Coverage rates ranged from 44.1 to 88.8 percent for the 2005 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:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	156	96.9%
DTP2/DTaP2	151	93.8%
DTP3/DTaP3	136	84.5%
DTP4/DTaP4	1	0.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	155	96.3%
OPV/IPV2	149	92.5%
OPV/IPV3	75	46.6%
OPV/IPV4	0	0.0%
MMR1	5	3.1%
MMR2	0	0.0%
HIB1	156	96.9%
HIB2	148	91.9%
HIB3	47	29.2%
HIB4	1	0.6%
HIB5	0	0.0%
HEPB1	156	96.9%
HEPB2	150	93.2%
HEPB3	75	46.6%
HEPB4	5	3.1%
VAR1	5	3.1%
VAR2	0	0.0%
PCV1	147	91.3%
PCV2	136	84.5%
PCV3	111	68.9%
PCV4	3	1.9%
PCV5	0	0.0%

*Percent = number immunized / sample size
sample size = 161

Table 24:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 1-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	123/154 (79.9)	140/174 (80.5)	96/135 (71.1)	154/185 (83.2)	119/149 (79.9)
Black	8/12 (66.7)	19/23 (82.6)	9/16 (56.3)	21/27 (77.8)	10/13 (76.9)
Other	----	3/3 (100.0)	----	5/6 (83.3)	1/1 (100.0)
Unknown	---	---	---	---	1/1 (100.0)
Total	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)	131/164 (79.9)

Table 24 contains a cross tabulation of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals in each category. The bottom row in each cell represents the percent in that immunization status category.

- Table 24 shows that in 2002 the 4:3:1 immunization rate of children born to black mothers was higher than that of children born to white mothers in the district. However, in 2001, 2003, 2004 and 2005 the immunization rate of children born to white mothers was higher than that of black mothers.

Table 25:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 1-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/15 (93.3)	9/14 (64.3)	2/2 (100.0)	3/3 (100.0)	9/9 (100.0)
Some high school	29/41 (70.7)	36/50 (72.0)	18/25 (72.0)	22/26 (84.6)	9/16 (56.3)
High school graduate	41/52 (78.8)	66/79 (83.5)	25/43 (58.1)	73/89 (82.0)	57/70 (81.4)
Some college	27/35 (77.1)	29/35 (82.9)	24/31 (77.4)	35/46 (76.1)	22/26 (84.6)
College or more	20/23 (87.0)	19/20 (95.0)	36/50 (72.0)	47/54 (87.0)	34/43 (79.1)
Unknown	---	3/3 (100.0)	---	---	---
Total	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)	131/164 (79.9)

Table 25 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status in District 1-1. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- For the 2005 study, immunization rates varied with educational attainment.

Table 26:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 1-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	79/99 (79.8)	49/78 (62.8)	84/103 (81.6)	62/77 (80.5)
Non-Medicaid	83/102 (81.4)	56/73 (76.7)	96/115 (83.5)	69/87 (79.3)
Total	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)	131/164 (79.9)

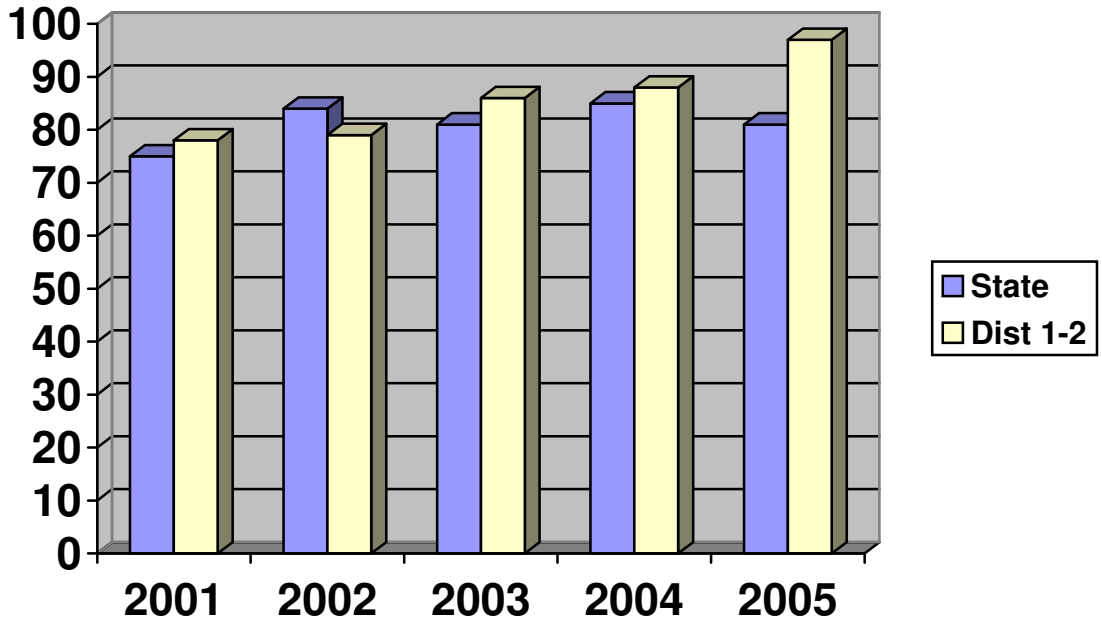
Table 26 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For the 2005 study, children born to non-Medicaid women had a slightly lower immunization rate than children born to women using Medicaid.

Individual Health District Report: District 1-2

The eligible sample from this district included 140 children born in January 2003. From these children, 139 records were located (Response Rate=99.3%). Of the 139 located records, there were 5 parental refusals leaving a final sample of 134 records.

- **4:3:1 immunization coverage estimate is 97.0 percent (130/134)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **4:3:1:3 immunization coverage estimate 97.0 percent (130/134)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **4:3:1:3:3:1 immunization coverage estimate 91.8 percent (123/134)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 27:
District Immunization Rates for
Health District 1-2 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	79.5%	82.3%	86.3%	88.2%	97.8%
3 OPV/IPV	86.3%	85.4%	88.9%	92.2%	98.5%
1 MMR	85.6%	87.3%	90.8%	94.1%	97.8%
3 Hib	95.2%	86.1%	90.8%	94.1%	97.8%
3 HepB	93.2%	87.3%	90.8%	94.1%	98.5%
1 Varicella	82.9%	86.1%	90.2%	95.1%	97.8%
3 PCV	---	---	---	56.9%	95.5%
4 PCV	---	---	---	14.7%	52.2%

*PCV data not collected before 2004.

Table 27 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 52.2 to 98.5 percent for the 2005 study data.

Table 28 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 28:
2005 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 1-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	129	96.3%
DTP2/DTaP2	126	94.0%
DTP3/DTaP3	119	88.8%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	129	96.3%
OPV/IPV2	125	93.3%
OPV/IPV3	67	50.0%
OPV/IPV4	0	0.0%
MMR1	2	1.5%
MMR2	0	0.0%
HIB1	129	96.3%
HIB2	124	92.5%
HIB3	37	27.6%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	129	96.3%
HEPB2	128	95.5%
HEPB3	46	34.3%
HEPB4	3	2.2%
VAR1	6	4.5%
VAR2	0	0.0%
PCV1	128	95.5%
PCV2	123	91.8%
PCV3	104	77.6%
PCV4	2	1.5%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 134

Table 29:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 1-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	112/142 (78.9)	118/149 (79.2)	118/145 (81.4)	86/98 (87.8)	112/115 (97.4)
Black	2/4 (50.0)	2/3 (66.7)	1/2 (50.0)	3/3 (100.0)	2/2 (100.0)
Other	---	2/2 (100.0)	4/6 (66.7)	1/1 (100.0)	3/3 (100.0)
Unknown	---	3/4 (75.0)	---	---	13/14 (92.9)
Total	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)	130/134 (97.0)

Table 29 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The sample of non-white mothers in the district was too small to make generalizations from these numbers.

Table 30:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 1-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/20 (70.0)	10/10 (100.0)	3/3 (100.0)	1/1 (100.0)	16/17 (94.1)
Some high school	32/37 (86.5)	28/37 (75.7)	16/22 (72.7)	15/19 (79.0)	16/16 (100.0)
High school graduate	30/45 (66.7)	25/36 (69.4)	36/44 (81.8)	28/30 (93.3)	28/28 (100.0)
Some college	21/23 (91.3)	31/37 (83.8)	24/30 (80.0)	8/10 (80.0)	30/31 (96.8)
College or more	17/21 (81.0)	29/34 (85.3)	44/54 (81.5)	38/42 (90.5)	40/42 (95.2)
Unknown	----	2/4 (50.0)	----	---	---
Total	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)	130/134 (97.0)

Table 30 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Immunization rates varied from year to year in relation to education of the mother.

Table 31:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 1-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	44/60 (73.3)	43/62 (69.4)	43/52 (82.7)	61/64 (95.3)
Non-Medicaid	81/98 (82.7)	80/91 (87.9)	47/50 (94.0)	69/70 (98.6)
Total	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)	130/134 (97.0)

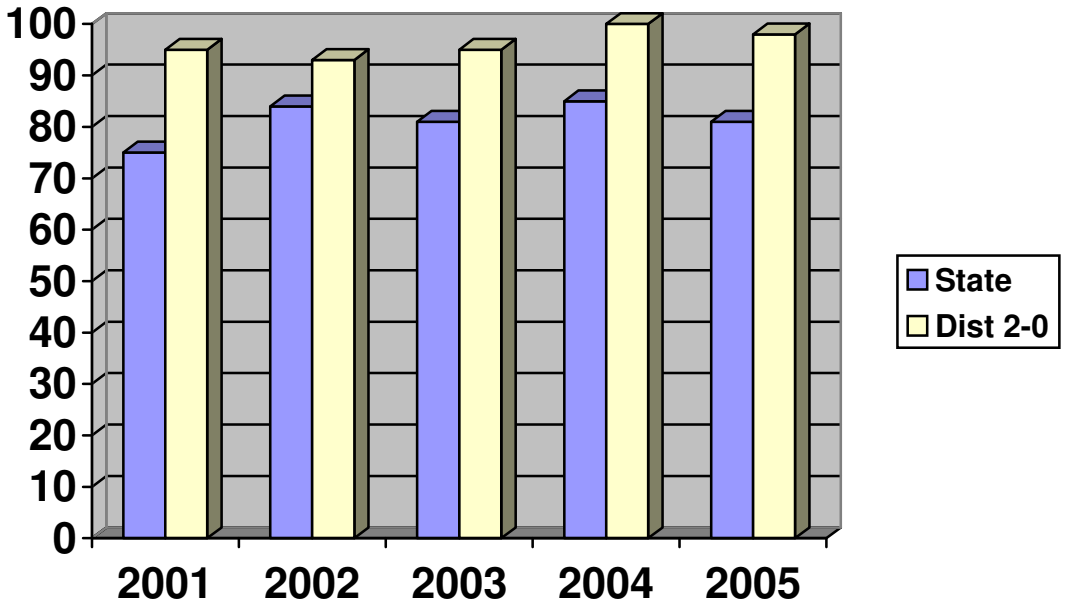
Table 31 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For Health District 1-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 2-0

The eligible sample from this district included 50 children born in January 2003. From the 50 children, 47 records were located (Response rate = 94.0%). Of the 47 located records, there was 1 parental refusal leaving a final sample of 46 records.

- **4:3:1 immunization coverage estimate is 97.8% percent (45/46)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **4:3:1:3 immunization coverage estimate is 93.5 percent (43/46)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **4:3:1:3:3:1 immunization coverage estimate is 91.3 percent (42/46)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 32:
District Immunization Rates for
Health District 2-0 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	94.8%	94.7%	95.7%	100%	97.8%
3 OPV/IPV	97.0%	97.4%	94.7%	100%	97.8%
1 MMR	97.0%	96.1%	96.8%	100%	97.8%
3 Hib	96.3%	96.1%	93.6%	100%	95.7%
3 HepB	95.6%	97.4%	93.6%	100%	93.5%
1 Varicella	94.8%	96.1%	96.8%	98.5%	97.8%
3 PCV	---	---	---	77.6%	95.7%
4 PCV	---	---	---	28.4%	65.2%

*PCV data not collected before 2004.

Table 32 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 65.2 to 97.8 percent for the 2005 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:
2005 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 2-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	45	97.8%
DTP2/DTaP2	45	97.8%
DTP3/DTaP3	44	95.7%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	45	97.8%
OPV/IPV2	45	97.8%
OPV/IPV3	20	43.5%
OPV/IPV4	0	0.0%
MMR1	4	91.3%
MMR2	0	0.0%
HIB1	45	97.8%
HIB2	45	97.8%
HIB3	11	23.9%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	45	97.8%
HEPB2	45	97.8%
HEPB3	24	52.2%
HEPB4	0	0.0%
VAR1	4	8.7%
VAR2	0	0.0%
PCV1	44	95.7%
PCV2	44	95.7%
PCV3	42	91.3%
PCV4	1	2.2%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 46

Table 34:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 2-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	121/127 (95.3)	65/70 (92.9)	82/91 (90.1)	65/65 (100.0)	43/44 (97.7)
Black	5/6 (83.3)	4/4 (100.0)	3/3 (100.0)	2/2 (100.0)	1/1 (100.0)
Other	2/2 (100.0)	2/2 (100.0)	---	---	1/1 (100.0)
Total	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)	45/46 (97.8)

Table 34 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 34 shows that the number of white mothers was over 10 times the number of black mothers in each year of the study for District 2-0. The sample size of black mothers was too small to make definitive generalizations on racial differences in immunization rates.

Table 35:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 2-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	23/25 (92.0)	9/9 (100.0)	1/1 (100.0)	---	4/4 (100.0)
Some high school	24/24 (100.0)	15/18 (83.3)	11/12 (91.7)	11/11 (100.0)	7/7 (100.0)
High school graduate	38/42 (90.5)	20/21 (95.2)	38/41 (92.7)	16/16 (100.0)	10/11 (91.0)
Some college	15/16 (93.8)	7/8 (87.5)	5/7 (71.4)	9/9 (100.0)	4/4 (100.0)
College or more	28/28 (100.0)	17/17 (100.0)	30/33 (90.9)	31/31 (100.0)	20/20 (100.0)
Unknown	---	3/3 (100.0)	---	---	---
Total	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)	45/46 (97.8)

Table 35 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 2-0 was nearly 100% for each level of educational attainment, with no correlation regarding educational level.

Table 36:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 2-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	24/28 (85.7)	49/52 (94.2)	29/29 (100.0)	19/19 (100.0)
Non-Medicaid	47/48 (97.9)	36/42 (85.7)	38/38 (100.0)	26/27 (96.3)
Total	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)	45/46 (97.8)

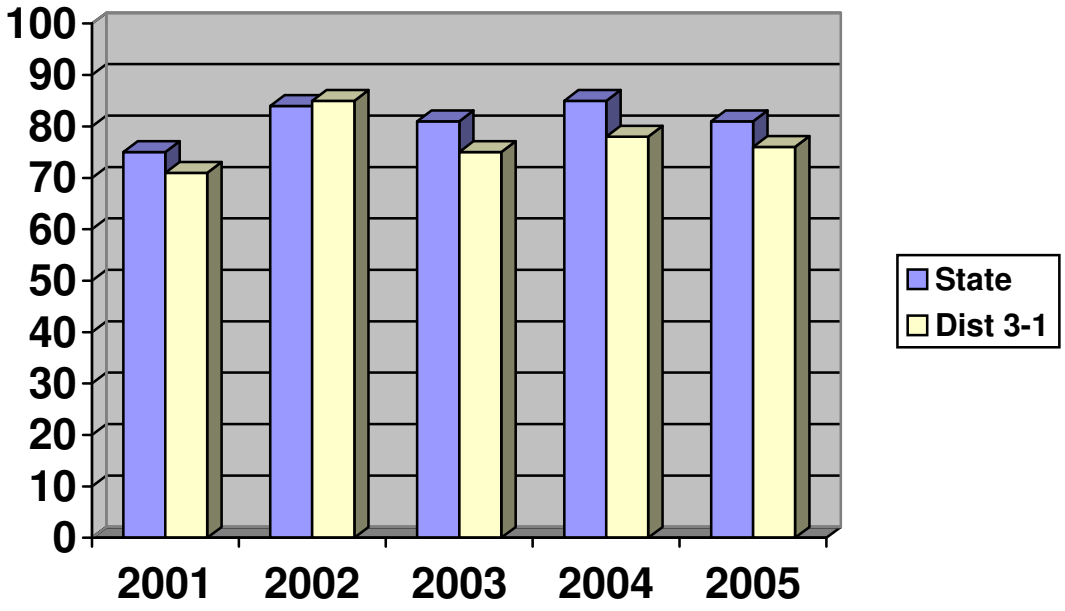
Table 36 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. During the 2005 study, children born to Medicaid women had a higher immunization rate than children born to non-Medicaid women.

Individual Health District Report: District 3-1

The eligible sample from this district included 239 children born in January 2003. From the 239 children, 198 records were located (Response Rate=82.8%). Of the 239 located records, there were 3 parental refusals leaving a final sample of 195 records.

- **The 4:3:1 immunization coverage estimate is 75.9 percent (148/195)**. This rate is lower than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 74.4 percent (145/195)**. This rate is lower than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 68.2 percent (133/195)**. This rate is also lower than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 37:
District Immunization Rates for
Health District 3-1 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	70.7%	84.9%	76.6%	78.8%	79.0%
3 OPV/IPV	75.3%	90.8%	83.4%	83.5%	86.2%
1 MMR	77.0%	90.1%	80.7%	86.3%	82.1%
3 Hib	83.9%	91.2%	82.1%	82.1%	84.1%
3 HepB	82.8%	92.6%	86.2%	83.0%	83.6%
1 Varicella	72.4%	88.4%	80.7%	83.5%	82.6%
3 PCV	---	---	---	46.7%	82.1%
4 PCV	---	---	---	23.1%	45.6%

*PCV data not collected before 2004.

Table 37 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 45.6 to 86.2 percent for the 2005 study data.

Table 38 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 38:
2005 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	189	96.9%
DTP2/DTaP2	180	92.3%
DTP3/DTaP3	171	87.7%
DTP4/DTaP4	3	1.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	187	95.9%
OPV/IPV2	178	91.3%
OPV/IPV3	102	52.3%
OPV/IPV4	3	1.5%
MMR1	7	3.6%
MMR2	0	0.0%
HIB1	185	94.9%
HIB2	175	89.7%
HIB3	72	36.9%
HIB4	3	1.5%
HIB5	0	0.0%
HEPB1	187	95.9%
HEPB2	179	91.8%
HEPB3	102	52.3%
HEPB4	15	7.7%
VAR1	7	3.6%
VAR2	0	0.0%
PCV1	178	91.3%
PCV2	171	87.7%
PCV3	146	74.9%
PCV4	5	2.6%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 195

Table 39:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 3-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	95/128 (74.2)	179/207 (86.5)	84/108 (77.8)	118/142 (83.1)	119/146 (81.5)
Black	22/40 (55.0)	51/66 (77.3)	21/35 (60.0)	40/60 (66.7)	28/44 (63.6)
Other	6/6 (100.0)	8/9 (88.9)	1/2 (50.0)	8/10 (80.0)	1/5 (20.0)
Unknown	---	2/2 (100.0)	---	---	---
Total	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)	148/195 (75.9)

Table 39 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 39 shows that the number of white mothers in the District 3-1 sample was substantially higher than the number of black mothers in each year of the study. The table also shows no clear relationship between race and immunization status in this district.

Table 40:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 3-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/16 (43.8)	17/26 (65.4)	3/3 (100.0)	5/8 (62.5)	15/17 (88.2)
Some high school	17/23 (73.9)	21/28 (75.0)	7/10 (70.0)	9/11 (81.8)	8/13 (61.5)
High school graduate	41/53 (77.4)	60/74 (81.1)	25/38 (65.8)	37/52 (71.2)	45/57 (78.9)
Some college	22/34 (64.7)	38/46 (82.6)	14/23 (60.9)	33/46 (71.2)	16/28 (57.1)
College or more	36/48 (75.0)	99/105 (94.3)	57/71 (80.3)	82/95 (86.3)	64/80 (80.0)
Unknown	---	5/5 (100.0)	---	---	---
Total	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)	148/195 (75.9)

Table 40 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers.

- In the 2002 study year, immunization status of children in District 3-1 varied significantly (p-value = 0.002) with maternal educational attainment. Immunization status increased as maternal education increased. The other study years showed no correlation between educational attainment and immunization rate.

Table 41:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	58/79 (73.4)	21/35 (60.0)	53/71 (74.6)	60/78 (76.9)
Non-Medicaid	182/205 (88.8)	85/110 (77.3)	113/141 (80.1)	88/117 (75.2)
Total	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)	148/195 (75.9)

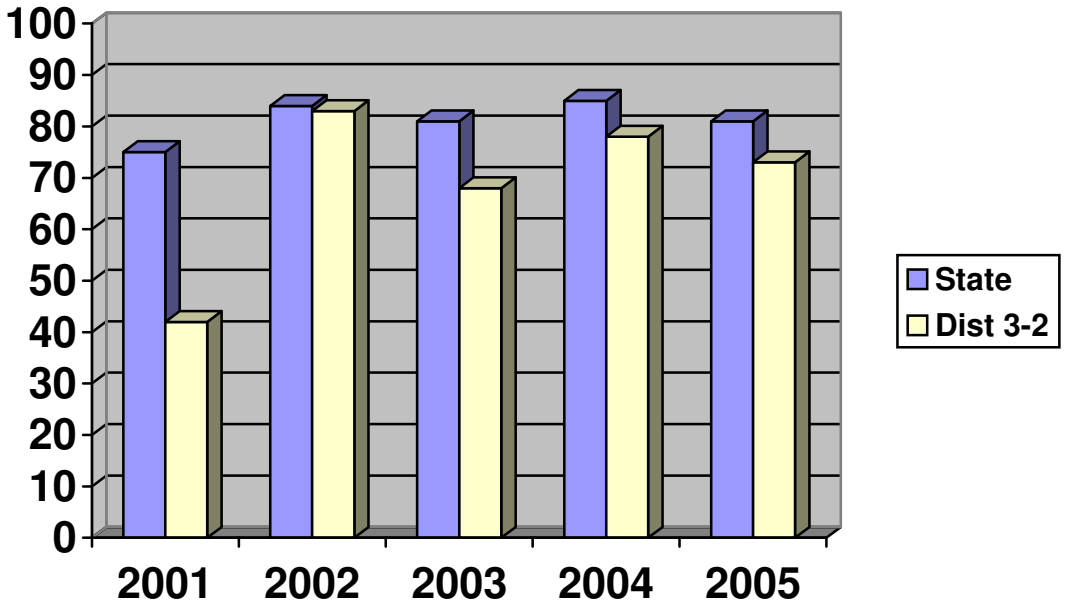
Table 41 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For the 2005 study, children born to Medicaid women had a slightly higher immunization rate than children born to women using non-Medicaid.

Individual Health District Report: District 3-2

The eligible sample from this district included 538 children born in January 2003. From the 538 children, 353 records were located (Response Rate=65.6%). Of the 353 located records, there were 36 parental refusals leaving a final sample of 317 records.

- **The 4:3:1 immunization coverage estimate is 72.6 percent (230/317)**. This rate is lower than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 72.2 percent (229/317)**. This rate is lower than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 70.7 percent (224/317)**. This rate is also lower than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 42:
District Immunization Rates for
Health District 3-2 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	42.4%	84.0%	68.1%	78.8%	73.8%
3 OPV/IPV	45.5%	84.7%	71.7%	85.0%	81.1%
1 MMR	45.1%	84.7%	71.0%	82.7%	80.4%
3 Hib	45.5%	85.4%	72.5%	84.1%	81.4%
3 HepB	44.4%	84.7%	74.6%	85.4%	81.1%
1 Varicella	44.4%	81.9%	71.7%	81.4%	78.5%
3 PCV	---	---	---	66.8%	79.8%
4 PCV	---	---	---	35.8%	47.6%

*PCV data not collected before 2004.

Table 42 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 47.6 to 81.4 percent for the 2005 study data.

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

Table 43:
2005 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	294	92.7%
DTP2/DTaP2	273	86.1%
DTP3/DTaP3	246	77.6%
DTP4/DTaP4	4	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	295	93.1%
OPV/IPV2	271	85.5%
OPV/IPV3	156	49.2%
OPV/IPV4	1	0.3%
MMR1	13	4.1%
MMR2	1	0.3%
HIB1	292	92.1%
HIB2	269	84.9%
HIB3	120	37.9%
HIB4	4	1.3%
HIB5	0	0.0%
HEPB1	296	93.4%
HEPB2	276	87.1%
HEPB3	139	43.8%
HEPB4	17	5.4%
VAR1	19	6.0%
VAR2	0	0.0%
PCV1	279	88.0%
PCV2	262	82.6%
PCV3	226	71.3%
PCV4	8	2.5%
PCV5	0	0.0%

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

Table 44:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 3-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	66/148 (44.6)	69/79 (87.3)	50/76 (65.8)	95/113 (84.1)	127/159 (79.9)
Black	58/143 (40.6)	48/61 (78.7)	31/59 (52.5)	69/99 (69.7)	89/142 (62.7)
Other	2/6 (33.3)	2/3 (66.7)	3/3 (100.0)	13/14 (92.9)	12/14 (85.7)
Unknown	---	---	---	---	2/2 (100.0)
Total	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)	230/317 (72.6)

Table 44 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- In all years of the study, the immunization rate of children born to white mothers was higher than that of black mothers.

Table 45:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 3-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	16/30 (53.3)	7/9 (77.8)	3/3 (100.0)	3/3 (100.0)	11/17 (64.7)
Some high school	24/47 (51.1)	15/20 (75.0)	7/14 (50.0)	25/34 (73.5)	28/44 (63.6)
High school graduate	25/69 (36.2)	20/26 (76.9)	16/27 (59.3)	36/47 (76.6)	41/63 (65.1)
Some college	15/37 (40.5)	22/28 (78.6)	7/21 (33.3)	17/24 (70.8)	28/39 (71.8)
College or more	46/114 (40.4)	50/55 (90.9)	51/73 (69.9)	96/118 (81.3)	122/154 (79.2)
Unknown	---	5/6 (83.3)	---	---	---
Total	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)	230/317 (72.6)

Table 45 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 3-2 varied with maternal educational attainment.

Table 46:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	37/48 (77.1)	32/67 (47.8)	74/103 (71.8)	77/124 (62.1)
Non-Medicaid	82/96 (85.4)	52/71 (73.2)	103/123 (83.7)	153/193 (79.3)
Total	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)	230/317 (72.6)

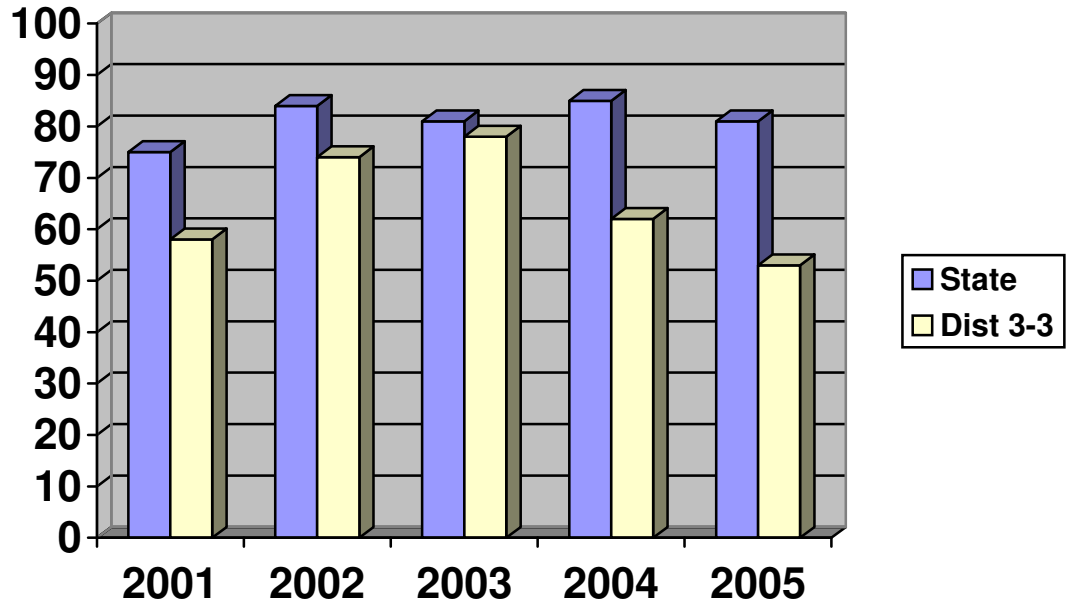
Table 46 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For Health District 3-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-3

The eligible sample from this district included 301 children born in January 2003. From the 301 children, 244 records were located (Response Rate=81.1%). Of the 244 located records, there were 0 parental refusals leaving a final sample of 244 records.

- **The 4:3:1 immunization coverage estimate is 53.3 percent (130/244)**. This rate is much lower than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 50.4 percent (123/244)**. This rate is much lower than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 47.1 percent (115/244)**. This rate is also much lower than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 47:
District Immunization Rates for
Health District 3-3 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	61.0%	73.9%	79.1%	67.4%	58.6%
3 OPV/IPV	69.5%	82.9%	85.8%	74.4%	68.4%
1 MMR	74.6%	84.7%	85.1%	75.6%	65.6%
3 Hib	81.4%	80.2%	88.4%	76.7%	71.7%
3 HepB	81.4%	80.2%	88.8%	77.9%	75.0%
1 Varicella	69.5%	82.9%	84.7%	74.4%	67.2%
3 PCV	---	---	---	30.2%	62.7%
4 PCV	---	---	---	11.6%	22.5%

*PCV data not collected before 2004.

Table 47 reveals the coverage rates of each vaccine series. Coverage rates ranged from 22.5 to 75.0 percent.

Table 48 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 48:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	232	95.1%
DTP2/DTaP2	219	89.8%
DTP3/DTaP3	189	77.5%
DTP4/DTaP4	2	0.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	232	95.1%
OPV/IPV2	217	88.9%
OPV/IPV3	92	37.7%
OPV/IPV4	1	0.4%
MMR1	11	4.5%
MMR2	0	0.0%
HIB1	231	94.7%
HIB2	212	86.9%
HIB3	123	50.4%
HIB4	4	1.6%
HIB5	0	0.0%
HEPB1	235	96.3%
HEPB2	217	88.9%
HEPB3	140	57.4%
HEPB4	5	2.0%
VAR1	11	4.5%
VAR2	1	0.4%
PCV1	203	83.2%
PCV2	173	70.9%
PCV3	132	54.1%
PCV4	2	0.8%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 244

Table 49:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 3-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	27/49 (55.1)	40/52 (76.9)	75/104 (72.1)	22/35 (62.9)	60/84 (71.4)
Black	39/67 (58.2)	38/54 (70.4)	103/142 (72.5)	31/47 (66.0)	63/137 (46.0)
Other	2/2 (100.0)	3/4 (75.0)	20/23 (87.0)	3/4 (75.0)	7/23 (30.4)
Unknown	---	1/1 (100.0)	---	---	---
Total	68/118 (57.6)	82/111 (73.9)	198/269 (73.6)	56/86 (65.1)	130/244 (53.3)

Table 49 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children born to white mothers was higher than the children born to black mothers.

Table 50:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 3-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	1/4 (25.0)	12/13 (92.3)	4/6 (66.7)	---	3/4 (75.0)
Some high school	17/31 (54.8)	10/18 (55.6)	28/40 (70.0)	4/6 (66.7)	16/31 (51.6)
High school graduate	31/48 (64.6)	25/36 (69.4)	57/85 (67.1)	18/30 (60.0)	31/69 (44.9)
Some college	15/26 (57.7)	17/21 (81.0)	52/62 (83.9)	13/23 (56.5)	24/57 (42.1)
College or more	4/9 (44.4)	16/20 (80.0)	57/76 (75.0)	21/27 (77.8)	56/83 (67.5)
Unknown	---	2/3 (66.7)	---	---	---
Total	68/118 (57.6)	82/111 (73.8)	198/269 (73.6)	56/86 (65.1)	130/244 (53.3)

Table 50 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 3-3 does not appear to change with educational attainment.

Table 51:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-3

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	41/58 (70.7)	92/127 (72.4)	31/54 (57.4)	69/134 (51.5)
Non-Medicaid	41/53 (77.4)	106/142 (74.6)	25/32 (78.1)	61/110 (55.5)
Total	82/111 (73.9)	198/269 (73.6)	56/86 (65.1)	130/244 (53.3)

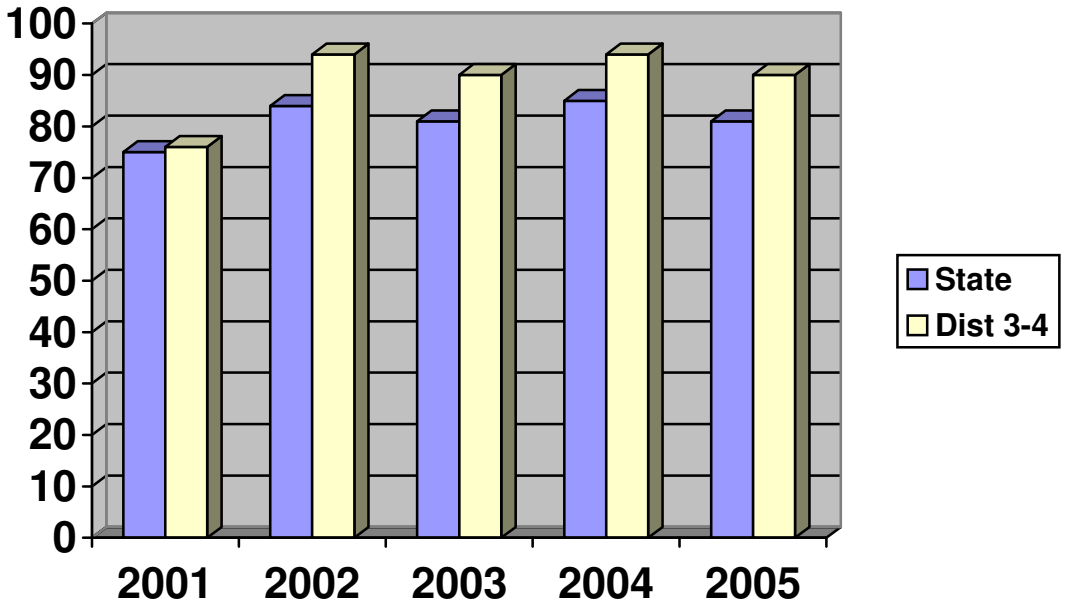
Table 51 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For Health District 3-3, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-4

The eligible sample from this district included 103 children born in January 2003. From the 103 children, 94 records were located (Response Rate=91.3%). Of the 94 located records, there were 2 parental refusals leaving a final sample of 92 records.

- **The 4:3:1 immunization coverage estimate is 90.2 percent (83/92)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 90.2 percent (83/92)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 88.0 percent (81/92)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 52:
District Immunization Rates for
Health District 3-4 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	75.9%	94.9%	90.0%	94.1%	92.4%
3 OPV/IPV	77.2%	96.0%	90.0%	96.1%	90.2%
1 MMR	83.5%	97.1%	90.0%	96.1%	91.3%
3 Hib	92.4%	96.6%	90.0%	96.7%	92.4%
3 HepB	86.1%	94.9%	90.0%	96.7%	91.3%
1 Varicella	86.1%	96.0%	90.0%	94.1%	92.4%
3 PCV	---	---	---	76.5%	90.2%
4 PCV	---	---	---	40.5%	53.3%

*PCV data not collected before 2004.

Table 52 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 53.3 to 92.4 percent for the 2005 study data.

Table 53 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 53:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-4

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	91	98.9%
DTP2/DTaP2	88	95.7%
DTP3/DTaP3	85	92.4%
DTP4/DTaP4	1	1.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	90	97.8%
OPV/IPV2	85	92.4%
OPV/IPV3	49	53.3%
OPV/IPV4	0	0.0%
MMR1	5	5.4%
MMR2	0	0.0%
HIB1	90	97.8%
HIB2	86	93.5%
HIB3	33	35.9%
HIB4	2	2.2%
HIB5	0	0.0%
HEPB1	90	97.8%
HEPB2	89	96.7%
HEPB3	44	47.8%
HEPB4	1	1.1%
VAR1	7	7.6%
VAR2	0	0.0%
PCV1	86	93.5%
PCV2	83	90.2%
PCV3	74	80.4%
PCV4	1	1.1%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 92

Table 54:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 3-4 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	43/56 (76.8)	122/127 (96.1)	37/42 (88.1)	106/115 (92.2)	59/62 (95.2)
Black	12/17 (70.6)	30/35 (85.7)	10/12 (83.3)	26/27 (96.3)	16/21 (76.2)
Other	5/6 (83.3)	11/11 (100.0)	5/6 (83.3)	11/11 (100.0)	8/8 (100.0)
Unknown	---	2/2 (100.0)	---	---	0/1 (0.0)
Total	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)	83/92 (90.2)

Table 54 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- For the 2005 study year, the immunization rates varied among race with no clear correlation.

Table 55:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 3-4 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
Less than high school	2/3 (66.7)	4/5 (80.0)	1/1 (100.0)	2/2 (100.0)	5/6 (83.3)
Some high school	7/11 (63.6)	15/18 (83.3)	3/3 (100.0)	12/14 (85.7)	6/9 (66.7)
High school graduate	16/25 (64.0)	58/61 (95.1)	17/21 (81.0)	35/35 (100.0)	22/23 (95.7)
Some college	8/10 (80.0)	27/29 (93.1)	9/10 (90.0)	29/33 (87.9)	13/15 (86.7)
College or more	27/30 (90.0)	55/56 (98.2)	22/25 (88.0)	65/69 (94.2)	37/39 94.9
Unknown	---	6/6 (100.0)	---	---	---
Total	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)	83/92 (90.2)

Table 55 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 3-4 appears to vary with educational attainment of the mother.

Table 56:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-4

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	41/46 (89.1)	17/19 (89.5)	59/65 (90.8)	26/33 (78.8)
Non-Medicaid	124/129 (96.1)	35/41 (85.4)	84/88 (95.5)	57/59 (96.6)
Total	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)	83/92 (90.2)

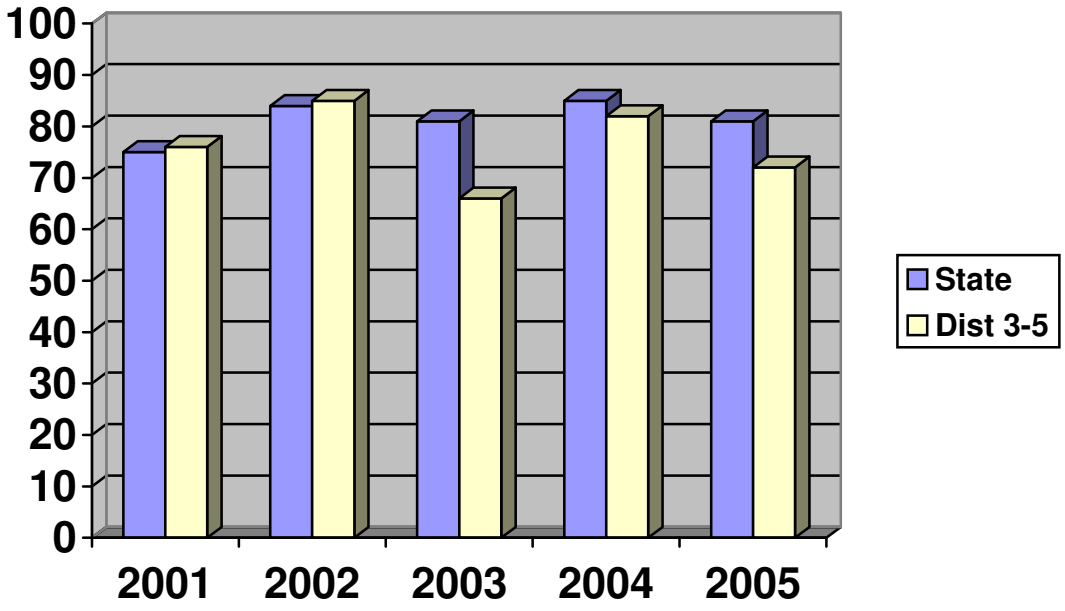
Table 56 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. In the 2005 study, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-5

The eligible sample from this district included 311 children born in January 2003. From the 311 children, 232 records were located (Response Rate=74.6%). Of the 232 located records, there was 1 parental refusal leaving a final sample of 231 records.

- **The 4:3:1 immunization coverage estimate is 72.3 percent (167/231)**. This rate is lower than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 69.7 percent (161/231)**. This rate is lower than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 68.0 percent (157/231)**. This rate is also lower than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 57:
District Immunization Rates for
Health District 3-5 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	77.0%	84.6%	66.0%	82.4%	74.0%
3 OPV/IPV	83.7%	88.7%	82.0%	89.5%	83.1%
1 MMR	87.8%	86.7%	80.7%	90.8%	84.8%
3 Hib	89.3%	86.2%	76.0%	88.3%	82.3%
3 HepB	88.8%	85.6%	78.0%	89.1%	82.3%
1 Varicella	81.1%	83.6%	74.0%	89.5%	85.7%
3 PCV	---	---	---	43.5%	73.2%
4 PCV	---	---	---	19.7%	38.5%

*PCV data not collected before 2004.

Table 57 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 38.5 to 85.7 percent for the 2005 study data.

Table 58 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 58:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-5

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	220	95.2%
DTP2/DTaP2	210	90.9%
DTP3DTaP3	188	81.4%
DTP4/DTaP4	2	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	219	94.8%
OPV/IPV2	208	90.0%
OPV/IPV3	122	52.8%
OPV/IPV4	3	1.3%
MMR1	9	3.9%
MMR2	0	0.0%
HIB1	215	93.1%
HIB2	206	89.2%
HIB3	73	31.6%
HIB4	1	0.4%
HIB5	0	0.0%
HEPB1	222	96.1%
HEPB2	208	90.0%
HEPB3	94	40.7%
HEPB4	0	0.0%
VAR1	11	4.8%
VAR2	0	0.0%
PCV1	196	84.8%
PCV2	184	79.7%
PCV3	143	61.9%
PCV4	5	2.2%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 231

Table 59:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 3-5 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
White	38/52 (73.1)	51/63 (81.0)	36/45 (80.0)	62/74 (83.8)	67/90 (74.4)
Black	100/130 (76.9)	101/117 (86.3)	53/100 (53.0)	123/154 (80.0)	87/127 (68.5)
Other	10/14 (71.4)	9/10 (90.0)	2/5 (40.0)	11/11 (100.0)	13/13 (100.0)
Unknown	---	4/5 (80.0)	---	---	0/1 (0.0)
Total	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)	167/231 (72.3)

Table 59 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 59 shows that the number of white mothers was less than that of black mothers in each year. The immunization rates of children in District 3-5 varied with maternal race with no clear trend emerging.

Table 60:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 3-5 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/17 (70.6)	11/15 (73.3)	2/5 (40.0)	5/6 (83.3)	13/18 (72.2)
Some high school	17/25 (68.0)	19/22 (86.4)	9/13 (69.2)	27/37 (73.0)	20/26 (76.9)
High school graduate	43/59 (72.9)	40/48 (83.3)	22/42 (52.4)	49/59 (83.1)	42/57 (73.7)
Some college	33/46 (71.7)	38/49 (77.6)	21/39 (53.8)	43/49 (87.8)	29/45 (64.4)
College or more	43/49 (87.8)	51/54 (94.4)	37/51 (72.5)	72/88 (81.8)	63/85 (74.1)
Unknown	---	6/7 (85.7)	---	---	---
Total	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)	167/231 (72.3)

Table 60 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- In all study years, the immunization status of the children in District 3-5 varied with level of maternal educational attainment.

Table 61:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-5

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	66/82 (80.5)	36/72 (50.0)	95/117 (81.2)	78/106 (73.6)
Non-Medicaid	99/113 (87.6)	55/78 (70.5)	101/122 (82.8)	89/125 (71.2)
Total	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)	167/231 (72.3)

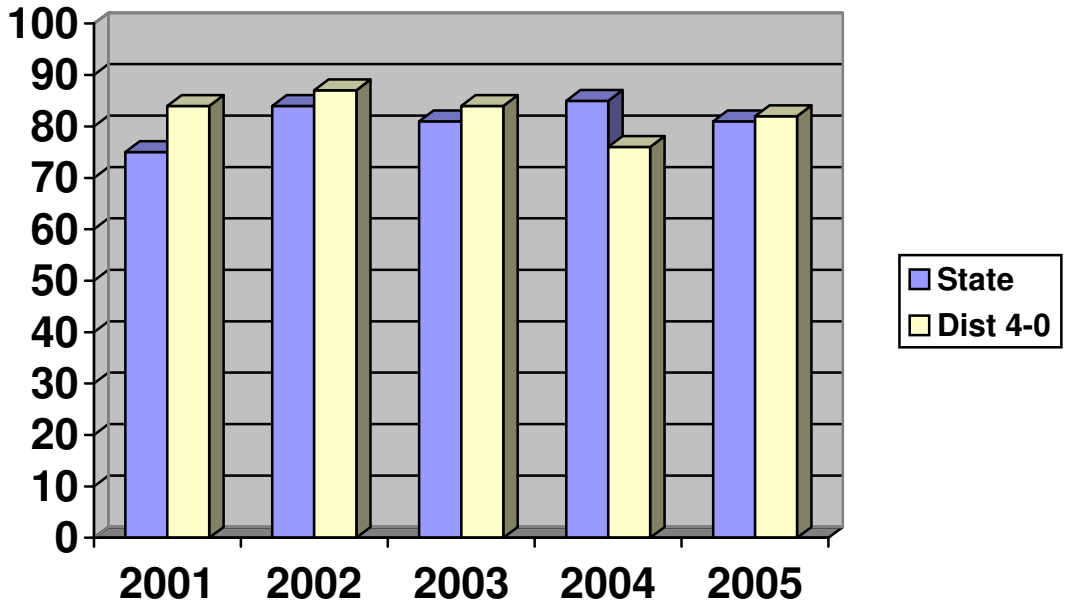
Table 61 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For the 2005 study, children born to Medicaid women had a slightly higher immunization rate than children born to women using non-Medicaid.

Individual Health District Report: District 4-0

The eligible sample from this district included 247 children born in January 2003. From the 247 children, 226 records were located (Response Rate=91.5%). Of the 226 located records, there were 2 parental refusals leaving a final sample of 224 records.

- **The 4:3:1 immunization coverage estimate is 81.7 percent (183/224)**. This rate is slightly higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 81.3 percent (182/224)**. This rate is slightly higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 79.5 percent (178/224)**. This rate is also slightly higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent

Table 62:
District Immunization Rates for
Health District 4-0 by Study Year

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	83.5%	87.8%	84.5%	79.1%	83.9%
3 OPV/IPV	86.4%	92.5%	92.7%	85.6%	87.0%
1 MMR	86.4%	93.2%	92.7%	85.0%	89.2%
3 Hib	88.3%	93.2%	87.3%	86.6%	88.8%
3 HepB	88.8%	92.5%	92.7%	86.1%	90.1%
1 Varicella	83.0%	92.5%	92.7%	85.0%	89.7%
3 PCV	---	---	---	32.1%	78.0%
4 PCV	---	---	---	9.1%	26.9%

*PCV data not collected before 2004.

Table 62 reveals the coverage rates of each vaccine series. Coverage rates ranged from 26.9 to 90.1 percent for the 2005 study data.

Table 63 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 63:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	220	98.7%
DTP2/DTaP2	212	95.1%
DTP3/DTaP3	199	89.2%
DTP4/DTaP4	5	2.2%
DTP5/DTaP5	0	0.0%
OPV/IPV1	220	98.7%
OPV/IPV2	212	95.1%
OPV/IPV3	108	48.4%
OPV/IPV4	1	0.4%
MMR1	6	2.7%
MMR2	0	0.0%
HIB1	220	98.7%
HIB2	209	93.7%
HIB3	89	39.9%
HIB4	4	1.8%
HIB5	1	0.4%
HEPB1	219	98.2%
HEPB2	213	95.5%
HEPB3	125	56.1%
HEPB4	10	4.5%
VAR1	4	1.8%
VAR2	0	0.0%
PCV1	205	91.9%
PCV2	196	87.9%
PCV3	155	69.5%
PCV4	4	1.8%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 223

Table 64:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 4-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	115/138 (83.3)	89/99 (89.9)	57/68 (83.8)	108/141 (76.6)	116/143 (81.1)
Black	54/65 (83.1)	39/47 (83.0)	29/42 (69.0)	34/43 (79.1)	58/72 (80.6)
Other	3/3 (100.0)	0/1 (0.0)	---	3/3 (100.0)	6/6 (100.0)
Unknown	---	---	---	---	3/3 (100.0)
Total	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)	183/224 (81.7)

Table 64 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 4-0 varies with maternal race.

Table 65:

Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 4-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/5 (80.0)	2/2 (100.0)	4/4 (100.0)	1/1 (100.0)	5/5 (100.0)
Some high school	43/49 (87.8)	37/44 (84.1)	21/29 (72.4)	21/28 (75.0)	21/28 (75.0)
High school graduate	69/84 (82.1)	44/52 (84.6)	28/33 (84.8)	57/71 (80.3)	55/67 (82.1)
Some college	32/41 (78.0)	24/26 (92.3)	15/20 (75.0)	23/32 (71.9)	50/61 (82.0)
College or more	24/27 (88.9)	21/23 (91.3)	18/24 (75.0)	43/55 (78.2)	52/63 (82.5)
Unknown	---	---	---	---	---
Total	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)	183/224 (81.7)

Table 65 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 4-0 appears to vary with educational attainment.

Table 66:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 4-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	62/71 (87.3)	53/69 (76.8)	76/95 (80.0)	84/106 (79.2)
Non-Medicaid	66/76 (86.8)	33/41 (80.5)	69/92 (75.0)	99/118 (83.9)
Total	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)	183/224 (81.7)

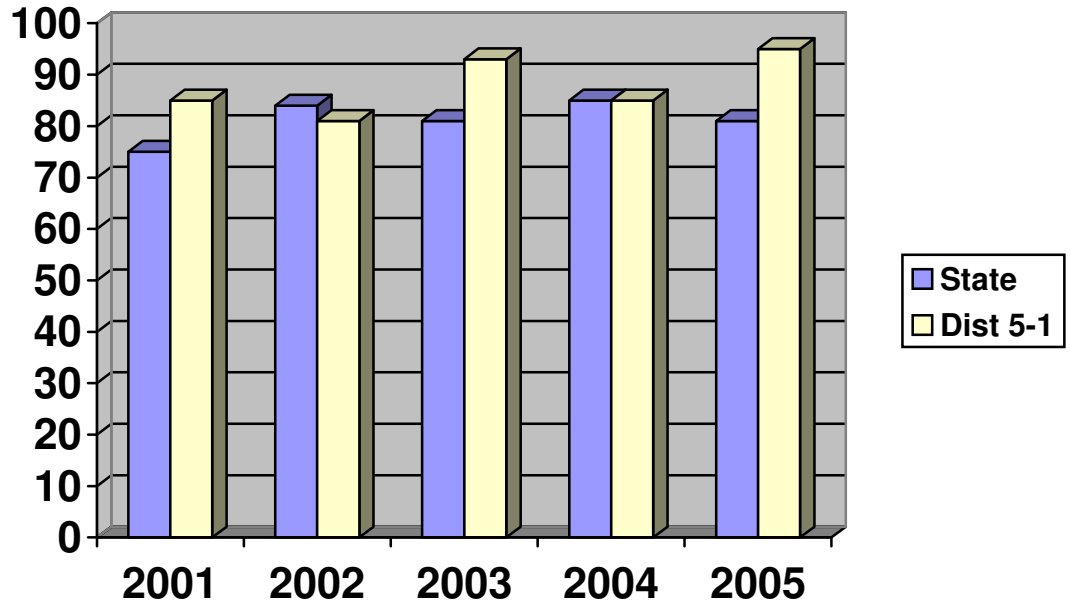
Table 66 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For the 2005 study, the immunization rate of children born to non-Medicaid women was higher than the immunization rate of children born to women using Medicaid.

Individual Health District Report: District 5-1

The eligible sample from this district included 78 children born in January 2003. From the 78 children, 76 records were located (Response Rate=97.4%). Of the 76 located records, there was 1 parental refusal leaving a final sample of 75 records.

- **The 4:3:1 immunization coverage estimate is 94.7 percent (71/75)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate 94.7 percent (71/75)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate 84.0 percent (63/75)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 67:
District Immunization Rates for
Health District 5-1 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	86.7%	80.8%	93.3%	85.5%	94.7%
3 OPV/IPV	93.3%	96.2%	97.8%	92.7%	96.0%
1 MMR	91.7%	97.4%	97.8%	90.9%	96.0%
3 Hib	91.7%	97.4%	97.8%	87.3%	96.0%
3 HepB	93.3%	96.2%	96.7%	90.9%	96.0%
1 Varicella	86.7%	84.6%	95.6%	90.9%	97.3%
3 PCV	---	---	---	23.6%	82.7%
4 PCV	---	---	---	3.6%	32.0%

*PCV data not collected before 2004.

Table 67 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 32.0 to 97.3 percent for the 2005 study data.

Table 68 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 68:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	70	93.3%
DTP2/DTaP2	70	93.3%
DTP3/DTaP3	63	84.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	70	93.3%
OPV/IPV2	69	92.0%
OPV/IPV3	41	54.7%
OPV/IPV4	0	0.0%
MMR1	2	2.7%
MMR2	0	0.0%
HIB1	70	93.3%
HIB2	66	88.0%
HIB3	11	14.7%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	70	93.3%
HEPB2	70	93.3%
HEPB3	45	60.0%
HEPB4	1	1.3%
VAR1	2	2.7%
VAR2	0	0.0%
PCV1	65	86.7%
PCV2	64	85.3%
PCV3	49	65.3%
PCV4	1	1.3%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 75

Table 69:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 5-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	32/36 (88.9)	34/44 (77.3)	56/64 (87.5)	27/32 (84.4)	39/41 (95.1)
Black	19/24 (79.2)	29/34 (85.3)	19/25 (76.0)	20/23 (87.0)	30/32 (93.8)
Other	---	---	1/1 (100.0)	---	2/2 (100.0)
Total	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)	71/75 (94.7)

Table 69 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization rates for District 5-1 vary with maternal race with no clear trend emerging.

Table 70:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 5-1

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	2/2 (100.0)	1/2 (50.0)	---	---	1/1 (100.0)
Some high school	13/19 (68.4)	23/26 (88.5)	13/16 (81.3)	9/10 (90.0)	12/14 (85.7)
High school graduate	19/21 (90.5)	28/36 (77.8)	30/36 (83.3)	18/23 (78.3)	36/38 (94.7)
Some college	11/12 (91.7)	3/3 (100.0)	10/12 (83.3)	8/9 (88.9)	5/5 (100.0)
College or more	6/6 (100.0)	8/11 (72.7)	23/26 (88.5)	12/13 (92.3)	17/17 (100.0)
Unknown	---	---	---	---	---
Total	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)	71/75 (94.7)

Table 70 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years of the study, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 5-1 varies with educational attainment.

Table 71:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 5-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	35/43 (81.4)	37/48 (77.1)	34/40 (80.0)	43/46 (93.5)
Non-Medicaid	28/35 (80.0)	39/42 (92.9)	13/15 (86.7)	28/29 (96.6)
Total	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)	71/75 (94.7)

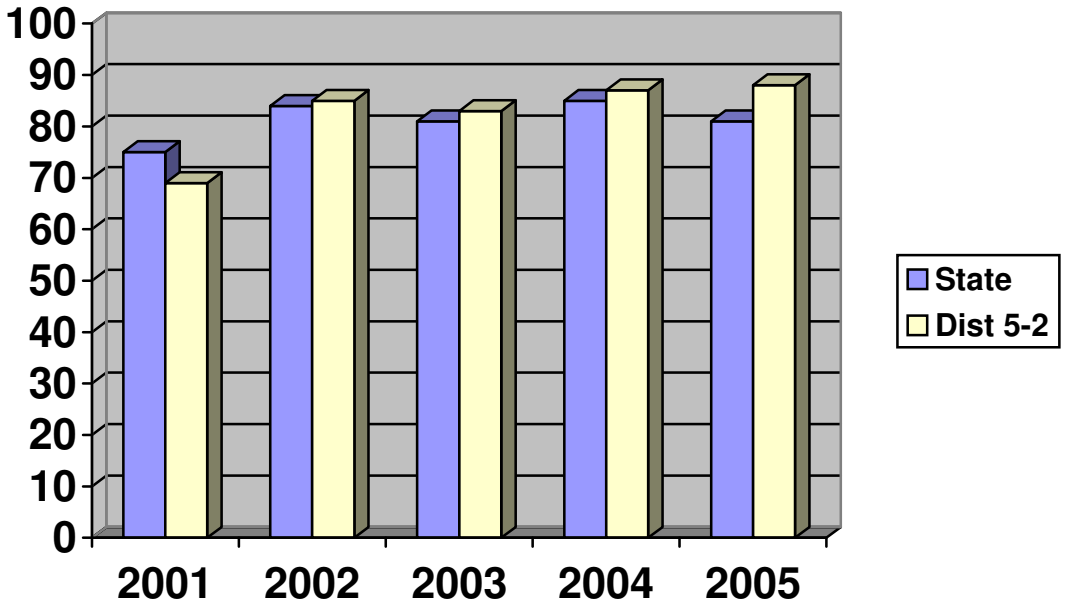
Table 71 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. The immunization rates for District 5-1 vary with maternal Medicaid status.

Individual Health District Report: District 5-2

The eligible sample from this district included 160 children born in January 2003. From the 160 children, 146 records were located (Response Rate=91.3%). Of the 146 located records, there were 7 parental refusals leaving a final sample of 139 records.

- **The 4:3:1 immunization coverage estimate is 87.8 percent (122/139)**. This rate is higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 86.3 percent (120/139)**. This rate is higher to the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 84.9 percent (118/139)**. This rate is also higher to the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 72:

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

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	72.7%	85.5%	84.9%	87.1%	88.5%
3 OPV/IPV	81.8%	94.0%	93.7%	93.2%	94.2%
1 MMR	82.7%	92.3%	96.8%	93.2%	92.1%
3 Hib	84.5%	92.7%	91.3%	91.2%	90.6%
3 HepB	83.6%	93.1%	93.7%	91.8%	92.1%
1 Varicella	80.0%	90.3%	92.9%	91.2%	92.8%
3 PCV	---	---	---	39.5%	69.1%
4 PCV	---	---	---	15.0%	36.0%

***PCV data not collected before 2004.

Table 72 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 36.0 to 94.2 percent for the 2005 study data.

Table 73 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 73:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	135	97.1%
DTP2/DTaP2	134	96.4%
DTP3/DTaP3	115	82.7%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	135	97.1%
OPV/IPV2	134	96.4%
OPV/IPV3	67	48.2%
OPV/IPV4	0	0.0%
MMR1	6	4.3%
MMR2	0	0.0%
HIB1	133	95.7%
HIB2	129	92.8%
HIB3	41	29.5%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	136	97.8%
HEPB2	134	96.4%
HEPB3	78	56.1%
HEPB4	3	2.2%
VAR1	4	2.9%
VAR2	0	0.0%
PCV1	120	86.3%
PCV2	110	79.1%
PCV3	76	54.7%
PCV4	4	2.9%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 139

Table 74:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 5-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	33/52 (63.5)	109/123 (88.6)	55/68 (80.9)	63/71 (88.8)	54/61 (88.5)
Black	43/58 (74.1)	96/120 (80.0)	41/56 (73.2)	62/73 (85.0)	49/58 (84.5)
Other	---	4/4 (100.0)	2/2 (100.0)	3/3 (100.0)	2/2 (100.0)
Unknown	----	1/1 (100.0)	---	---	17/18 (94.4)
Total	76/110 (69.1)	210/248 (84.7)	98/126 (77.8)	128/147 (87.1)	122/139 (87.8)

Table 74 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization rates for District 5-2 vary with maternal race with no clear trend emerging.

Table 75:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 5-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	1/4 (25.0)	1/4 (25.0)	---	1/1 (100.0)	22/23 (95.7)
Some high school	13/17 (76.5)	13/17 (76.5)	18/23 (78.3)	22/23 (95.7)	13/16 (81.3)
High school graduate	41/53 (77.4)	41/53 (77.4)	30/42 (71.4)	47/53 (88.7)	42/49 (85.7)
Some college	12/23 (52.2)	12/23 (52.2)	26/33 (78.8)	31/40 (78.0	24/28 (85.7)
College or more	9/13 (69.2)	9/13 (69.2)	24/28 (85.7)	27/30 (90.0)	21/23 (91.3)
Total	76/110 (69.1)	76/110 (69.1)	98/126 (77.8)	128/147 (87.1)	122/139 (87.8)

Table 75 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 5-2 varied with maternal educational attainment.

Table 76:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 5-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	103/131 (78.6)	48/70 (68.6)	79/91 (86.8)	72/86 (83.7)
Non-Medicaid	107/117 (91.5)	50/56 (89.3)	49/56 (88.0)	50/53 (94.3)
Total	210/248 (84.7)	98/126 (77.8)	128/147 (87.1)	122/139 (87.8)

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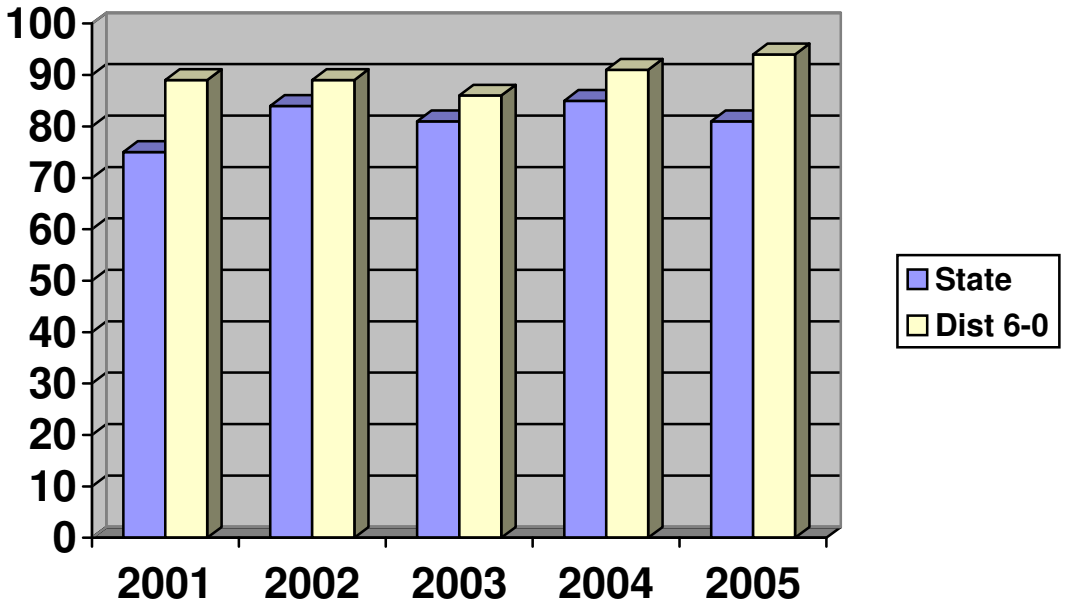
Table 76 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. In all study years, children born to women not using Medicaid had a higher immunization rate than children born to Medicaid women.

Individual Health District Report: District 6-0

The eligible sample from this district included 119 children born in January 2003. From the 119 children, 116 records were located (Response Rate=97.5%). Of the 116 located records, there was 1 parental refusal leaving a final sample of 115 records.

- **The 4:3:1 immunization coverage estimate is 93.9 percent (108/115)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 93.0 percent (107/115)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 88.7 percent (102/115)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 77:
District Immunization Rates for
Health District 6-0 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	89.5%	89.2%	87.8%	90.5%	94.8%
3 OPV/IPV	93.2%	95.1%	91.9%	94.8%	97.4%
1 MMR	95.1%	96.1%	91.9%	95.7%	94.8%
3 Hib	97.5%	97.1%	93.5%	92.2%	94.8%
3 HepB	93.2%	96.1%	95.1%	94.0%	95.7%
1 Varicella	88.3%	97.1%	90.2%	94.8%	93.9%
3 PCV	---	---	---	54.3%	90.4%
4 PCV	---	---	---	23.3%	52.2%

*PCV data not collected before 2004.

Table 77 reveals the coverage rates of each vaccine series. Coverage rates ranged from 52.2 to 97.4 percent for the 2005 study data.

Table 78 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 78:
2005 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 6-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	115	100.0%
DTP2/DTaP2	110	95.7%
DTP3/DTaP3	105	91.3%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	115	100.0%
OPV/IPV2	110	95.7%
OPV/IPV3	68	59.1%
OPV/IPV4	0	0.0%
MMR1	3	2.6%
MMR2	0	0.0%
HIB1	115	100.0%
HIB2	110	95.7%
HIB3	59	51.3%
HIB4	2	1.7%
HIB5	0	0.0%
HEPB1	115	100.0%
HEPB2	114	99.1%
HEPB3	82	71.3%
HEPB4	12	10.4%
VAR1	6	5.2%
VAR2	0	0.0%
PCV1	111	96.5%
PCV2	101	87.8%
PCV3	85	73.9%
PCV4	3	2.6%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 115

Table 79:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 6-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	57/65 (87.7)	39/42 (92.9)	51/61 (83.6)	53/56 (94.6)	47/50 (94.0)
Black	86/96 (89.6)	52/60 (86.7)	48/59 (81.4)	49/57 (86.0)	44/46 (95.7)
Other	1/1 (100.0)	---	3/3 (100.0)	3/3 (100.0)	3/3 (100.0)
Unknown	---	---	---	---	14/16 (87.5)
Total	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)	108/115 (93.9)

Table 79 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 79 shows that the immunization rates of children in District 6-0 varied with maternal race.

Table 80:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 6-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	10/12 (83.3)	3/3 (100.0)	0/1 (0.0)	---	15/17 (88.2)
Some high school	32/38 (84.2)	18/21 (85.7)	18/21 (81.8)	23/24 (95.8)	17/19 (89.5)
High school graduate	47/52 (90.4)	37/42 (88.1)	35/44 (79.5)	32/37 (86.5)	23/26 (88.5)
Some college	34/35 (97.1)	18/19 (94.7)	23/26 (88.5)	19/20 (95.0)	26/26 (100.0)
College or more	21/25 (84.0)	15/17 (88.2)	26/30 (86.7)	31/35 (88.6)	27/27 (100.0)
Total	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)	108/115 (93.9)

Table 80 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 6-0 varies with educational attainment.

Table 81:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 6-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	53/61 (86.9)	69/83 (83.1)	60/68 (88.2)	61/67 (91.0)
Non-Medicaid	38/41 (92.7)	33/40 (82.5)	45/48 (93.8)	47/48 (97.9)
Total	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)	108/115 (93.9)

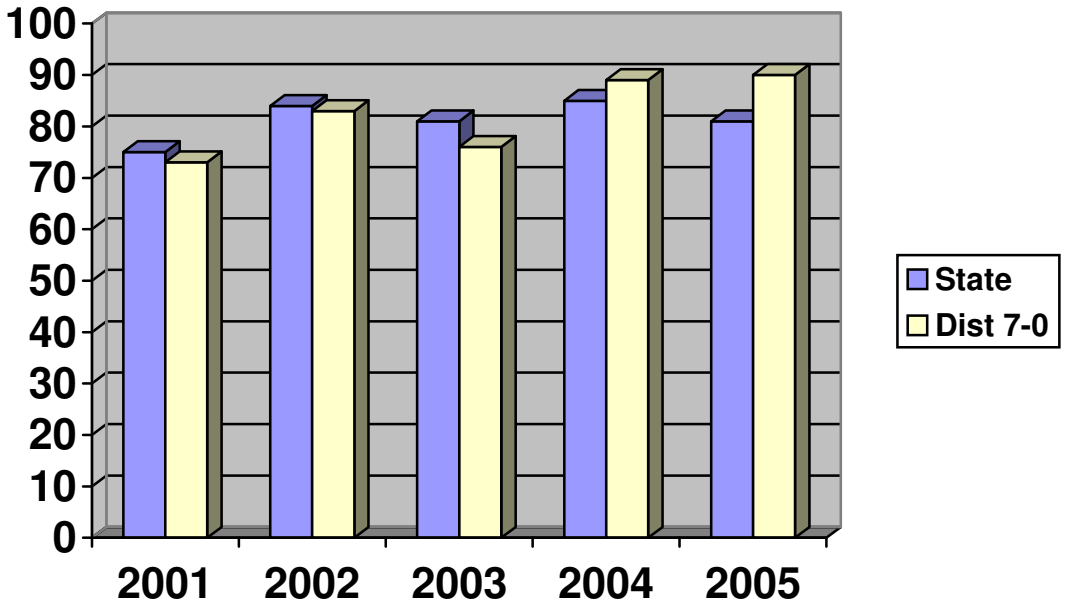
Table 81 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. Table 79 shows that the immunization rates of children in District 6-0 vary with maternal Medicaid status.

Individual Health District Report: District 7-0

The eligible sample from this district included 129 children born in January 2003. From the 129 children, 113 records were located (Response Rate=87.6%). Of the 113 located records, there were 0 parental refusals leaving a final sample of 113 records.

- **The 4:3:1 immunization coverage estimate is 90.3 percent (102/113)**. This rate is higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 88.5 percent (100/113)**. This rate is higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 85.8 percent (97/113)**. This rate is also higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 82:
District Immunization Rates for
Health District 7-0 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	74.3%	83.6%	77.1%	88.4%	90.3%
3 OPV/IPV	78.4%	90.5%	85.0%	93.5%	92.9%
1 MMR	80.2%	92.2%	87.9%	93.0%	93.8%
3 Hib	82.6%	89.7%	85.7%	93.0%	91.2%
3 HepB	85.0%	90.5%	87.9%	93.5%	93.8%
1 Varicella	74.9%	88.8%	85.7%	93.5%	93.8%
3 PCV	---	---	---	34.2%	67.3%
4 PCV	---	---	---	10.1%	35.4%

*PCV data not collected before 2004.

Table 82 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 35.4 to 93.8 percent for the 2005 study data.

Table 83 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 83:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 7-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	110	97.3%
DTP2/DTaP2	108	95.6%
DTP3/DTaP3	100	88.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	110	97.3%
OPV/IPV2	108	95.6%
OPV/IPV3	45	39.8%
OPV/IPV4	0	0.0%
MMR1	3	2.7%
MMR2	0	0.0%
HIB1	110	97.3%
HIB2	106	93.8%
HIB3	56	49.6%
HIB4	2	1.8%
HIB5	0	0.0%
HEPB1	110	97.3%
HEPB2	109	96.5%
HEPB3	76	67.3%
HEPB4	2	1.8%
VAR1	4	3.5%
VAR2	0	0.0%
PCV1	87	77.0%
PCV2	83	73.5%
PCV3	69	61.1%
PCV4	1	0.9%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 113

Table 84:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 7-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	43/64 (67.2)	36/44 (81.8)	26/38 (68.4)	79/86 (91.9)	38/43 (88.4)
Black	78/101 (77.2)	60/72 (83.3)	74/102 (72.5)	94/110 (85.5)	60/65 (92.3)
Other	1/2 (50.0)	---	---	3/3 (100.0)	3/3 (100.0)
Unknown	---	---	---	---	1/2 (50.0)
Total	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)	102/113 (90.3)

Table 84 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 84 shows that the immunization rates of children in District 7-0 varied with maternal race.

Table 85:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 7-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/6 (66.7)	3/3 (100.0)	1/1 (100.0)	2/2 (100.0)	2/3 (66.7)
Some high school	41/53 (77.4)	34/40 (85.0)	23/38 (60.5)	44/52 (84.6)	16/18 (88.9)
High school graduate	55/72 (76.4)	35/42 (83.3)	36/51 (70.6)	56/62 (90.3)	40/40 (100.0)
Some college	10/13 (76.9)	18/23 (78.3)	21/24 (87.5)	41/46 (89.1)	25/30 (83.3)
College or more	12/23 (52.2)	6/7 (85.7)	19/26 (73.1)	33/37 (89.2)	19/22 (86.4)
Unknown	---	0/1 (0.0)	---	---	---
Total	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)	102/113 (90.3)

Table 85 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 7-0 varies with maternal educational attainment.

Table 86:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 7-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	70/83 (84.3)	75/101 (74.3)	127/147 (86.4)	68/74 (91.9)
Non-Medicaid	26/33 (78.8)	25/39 (64.1)	49/52 (94.2)	34/39 (87.2)
Total	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)	102/113 (90.3)

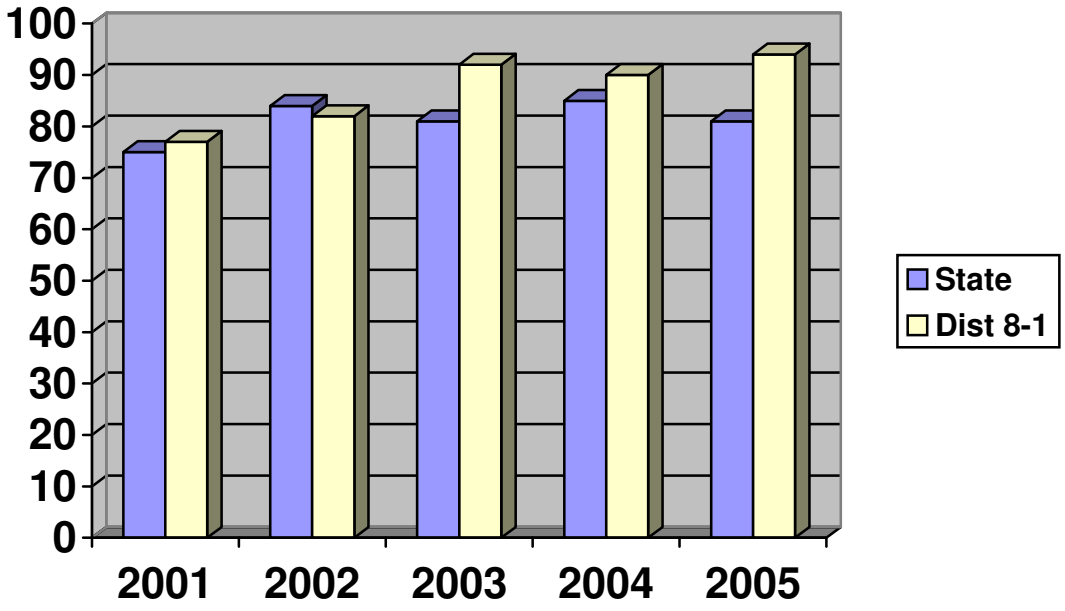
Table 86 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For Health District 7-0, immunization rates of children vary with maternal Medicaid status.

Individual Health District Report: District 8-1

The eligible sample from this district included 96 children born in January 2003. From the 96 children, 90 records were located (Response Rate=93.8%). Of the 90 located records, there were 2 parental refusals leaving a final sample of 88 records.

- **The 4:3:1 immunization coverage estimate is 94.3 percent (83/88)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 92.0 percent (81/88)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of percent 79.5.
- **The 4:3:1:3:3:1 immunization coverage estimate is 92.0 percent (81/88)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of percent 76.5.

Table 87:
District Immunization Rates for
Health District 8-1 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	77.7%	82.2%	91.9%	89.5%	94.3%
3 OPV/IPV	84.5%	91.5%	96.0%	96.1%	97.7%
1 MMR	82.5%	93.8%	95.2%	92.1%	97.7%
3 Hib	81.6%	94.6%	95.2%	94.7%	96.6%
3 HepB	84.5%	94.6%	96.0%	96.1%	97.7%
1 Varicella	78.6%	93.0%	94.4%	92.1%	96.6%
3 PCV	---	---	---	39.5%	88.6%
4 PCV	---	---	---	13.2%	31.8%

*PCV data not collected before 2004.

Table 87 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 31.8 to 97.7 percent for the 2005 study data.

Table 88 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 88:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	88	100.0%
DTP2/DTaP2	87	98.9%
DTP3/DTaP3	78	88.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	88	100.0%
OPV/IPV2	86	97.7%
OPV/IPV3	43	48.9%
OPV/IPV4	0	0.0%
MMR1	2	2.3%
MMR2	0	0.0%
HIB1	88	100.0%
HIB2	86	97.7%
HIB3	22	25.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	88	100.0%
HEPB2	88	100.0%
HEPB3	39	44.3%
HEPB4	4	4.5%
VAR1	3	3.4%
VAR2	0	0.0%
PCV1	86	97.7%
PCV2	81	92.0%
PCV3	64	72.7%
PCV4	3	3.4%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 88

Table 89:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 8-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	42/60 (70.0)	67/80 (83.8)	59/69 (85.5)	48/51 (94.1)	58/62 (93.5)
Black	36/42 (85.7)	38/48 (79.2)	45/53 (84.9)	19/24 (79.2)	20/21 (95.2)
Other	1/1 (100.0)	1/1 (100.0)	2/2 (100.0)	1/1 (100.0)	2/2 (100.0)
Unknown	---	---	---	---	3/3 (100.0)
Total	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)	83/88 (94.3)

Table 89 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 89 shows that the immunization rate of children varies with maternal race in District 8-1.

Table 90:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 8-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/13 (69.2)	6/9 (66.7)	---	1/1 (100.0)	4/4 (100.0)
Some high school	19/26 (73.1)	29/35 (82.9)	19/23 (82.6)	17/19 (89.5)	18/19 (94.7)
High school graduate	27/34 (79.4)	34/40 (85.0)	41/47 (87.2)	15/18 (83.3)	21/23 (91.3)
Some college	17/22 (77.3)	22/27 (81.5)	17/19 (89.5)	19/20 (95.0)	22/22 (100.0)
College or more	7/8 (87.5)	15/18 (83.3)	29/35 (82.9)	16/18 (88.9)	18/20 (90.0)
Total	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)	83/88 (94.3)

Table 90 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 8-1 varies with educational attainment.

Table 91:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 8-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	64/74 (86.5)	80/92 (87.0)	42/48 (87.5)	55/59 (93.2)
Non-Medicaid	42/55 (76.4)	26/32 (81.3)	26/28 (92.9)	28/29 (96.6)
Total	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)	83/88 (94.3)

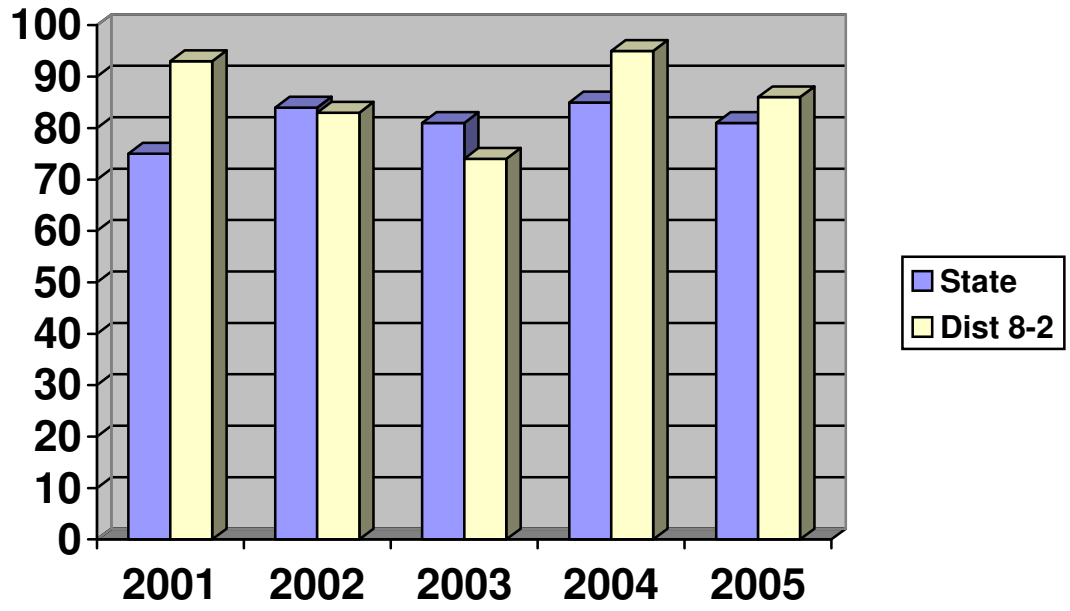
Table 91 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. Table 91 shows that the immunization rates of children in District 8-1 vary with maternal Medicaid status.

Individual Health District Report: District 8-2

The eligible sample from this district included 66 children born in January 2003. From the 66 children, 62 records were located (Response Rate=93.9%). Of the 62 located records, there were no parental refusals leaving a final sample of 62 records.

- **The 4:3:1 immunization coverage estimate is 85.5 percent (53/62)**. This rate is higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate rate is 85.5 percent (53/62)**. This rate is higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate rate is 83.9 percent (52/62)**. This rate is also higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 92:
District Immunization Rates for
Health District 8-2 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	94.7%	85.7%	75.3%	94.9%	87.1%
3 OPV/IPV	96.2%	90.9%	80.7%	97.7%	91.9%
1 MMR	97.0%	92.2%	81.3%	97.7%	93.5%
3 Hib	92.5%	92.2%	81.3%	98.3%	93.5%
3 HepB	95.5%	92.2%	82.0%	97.7%	98.4%
1 Varicella	96.2%	90.9%	78.0%	97.7%	93.5%
3 PCV	---	---	---	38.9%	85.5%
4 PCV	---	---	---	8.0%	27.4%

*PCV data not collected before 2004.

Table 92 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 27.4 to 98.4 percent for the 2005 study data.

Table 93 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 93:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	61	98.4%
DTP2/DTaP2	61	98.4%
DTP3/DTaP3	60	96.8%
DTP4/DTaP4	2	3.2%
DTP5/DTaP5	0	0.0%
OPV/IPV1	61	98.4%
OPV/IPV2	60	96.8%
OPV/IPV3	28	45.2%
OPV/IPV4	0	0.0%
MMR1	2	3.2%
MMR2	0	0.0%
HIB1	62	100.0%
HIB2	60	96.8%
HIB3	26	41.9%
HIB4	1	1.6%
HIB5	0	0.0%
HEPB1	62	100.0%
HEPB2	61	98.4%
HEPB3	38	61.3%
HEPB4	1	1.6%
VAR1	3	4.8%
VAR2	0	0.0%
PCV1	61	98.4%
PCV2	57	91.9%
PCV3	46	74.2%
PCV4	1	1.6%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 62

Table 94:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 8-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	55/58 (94.8)	21/28 (75.0)	47/78 (60.3)	83/88 (94.3)	24/30 (80.0)
Black	67/73 (91.8)	40/46 (87.0)	50/71 (70.4)	83/87 (95.4)	27/30 (90.0)
Other	2/2 (100.0)	1/1 (100.0)	0/1 (0.0)	---	---
Unknown	---	2/2 (100.0)	---	---	2/2 (100.0)
Total	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)	53/62 (85.5)

Table 94 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 94 shows that the immunization rates of children in District 8-2 vary with maternal race.

Table 95:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 8-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/9 (100.0)	7/10 (70.0)	0/2 (0.0)	2/2 (100.0)	4/4 (100.0)
Some high school	39/44 (88.6)	21/24 (87.5)	25/37 (67.6)	41/42 (97.6)	8/10 (80.0)
High school graduate	44/48 (91.7)	19/25 (76.0)	30/49 (61.2)	52/56 (92.9)	19/23 (82.6)
Some college	22/22 (100.0)	11/12 (91.7)	21/29 (72.4)	39/40 (97.5)	14/15 (93.3)
College or more	10/10 (100.0)	6/6 (100.0)	21/33 (63.6)	32/35 (91.4)	8/10 (80.0)
Total	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)	53/62 (85.5)

Table 95 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 8-2 varies with educational attainment.

Table 96:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 8-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	43/54 (79.6)	60/87 (70.0)	105/110 (95.5)	34/41 (82.9)
Non-Medicaid	21/23 (91.3)	37/63 (58.7)	61/65 (93.8)	19/21 (90.5)
Total	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)	53/62 (85.5)

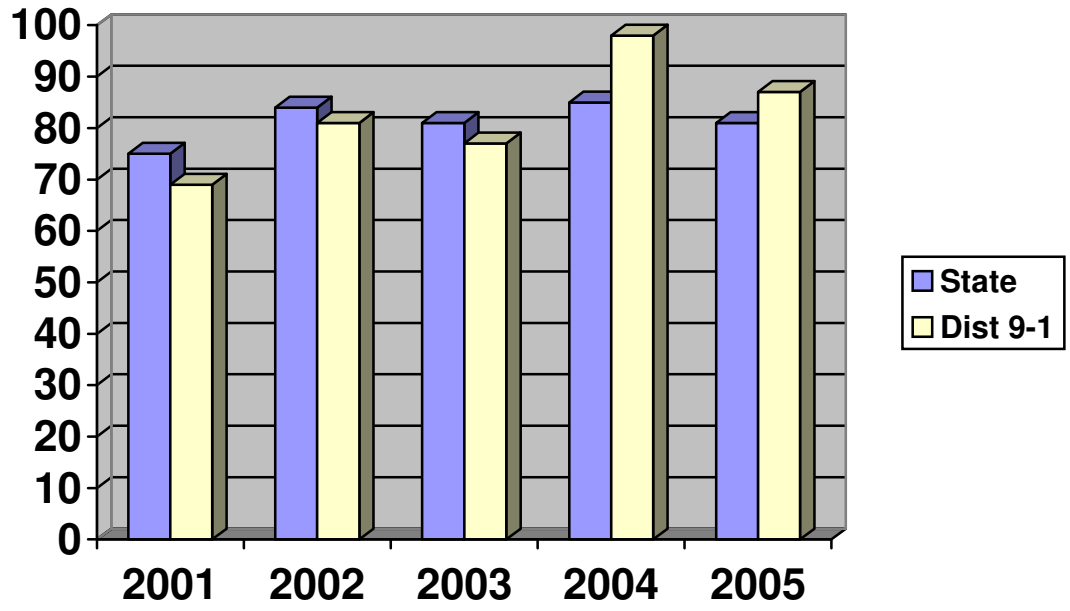
Table 96 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. In the 2005 study year, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 9-1

The eligible sample from this district included 64 children born in January 2003. From the 64 children, 54 records were located (Response Rate=84.4%). Of the 54 located records, there were no parental refusals leaving a final sample of 54 records.

- **The 4:3:1 immunization coverage estimate is 87.0 percent (47/54)**. This rate is higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 87.0 percent (47/54)**. This rate is higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 87.0 percent (47/54)**. This rate is also higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 97:
District Immunization Rates for
Health District 9-1 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	69.9%	81.6%	77.3%	97.5%	87.0%
3 OPV/IPV	79.7%	90.1%	88.7%	98.8%	94.4%
1 MMR	79.7%	89.5%	90.0%	98.8%	92.6%
3 Hib	81.3%	90.8%	87.3%	98.8%	94.4%
3 HepB	76.4%	90.1%	79.3%	100%	96.3%
1 Varicella	71.5%	83.6%	83.3%	98.8%	94.4%
3 PCV	---	---	---	53.1%	75.9%
4 PCV	---	---	---	17.3%	33.3%

*PCV data not collected before 2004.

Table 97 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 33.3 to 96.3 percent for the 2005 study data.

Table 98 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 98:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	54	100.0%
DTP2/DTaP2	49	90.7%
DTP3/DTaP3	47	87.0%
DTP4/DTaP4	1	1.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	54	100.0%
OPV/IPV2	49	90.7%
OPV/IPV3	31	57.4%
OPV/IPV4	0	0.0%
MMR1	3	5.6%
MMR2	0	0.0%
HIB1	54	100.0%
HIB2	49	90.7%
HIB3	22	40.7%
HIB4	3	5.6%
HIB5	0	0.0%
HEPB1	54	100.0%
HEPB2	54	100.0%
HEPB3	32	59.3%
HEPB4	3	5.6%
VAR1	2	3.7%
VAR2	0	0.0%
PCV1	46	85.2%
PCV2	41	75.9%
PCV3	34	63.0%
PCV4	2	3.7%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 54

Table 99:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 9-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	36/55 (65.5)	51/65 (78.5)	53/74 (71.6)	23/24 (96.3)	18/22 (81.8)
Black	47/66 (71.2)	70/83 (84.3)	55/73 (75.3)	51/52 (98.1)	26/29 (89.7)
Other	2/2 (100.0)	0/1 (0.0)	2/3 (66.7)	5/5 (100.0)	3/3 (100.0)
Unknown	---	2/3 (66.7)	---	---	---
Total	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)	79/81 (98.3)	47/54 (87.0)

Table 99 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 99 shows that the immunization rate of children born to white mothers was less than that of black mothers in each of the years of the study.

Table 100:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 9-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	0/2 (0.0)	2/2 (100.0)	---	---	---
Some high school	18/22 (81.8)	21/29 (72.4)	10/15 (66.7)	10/10 (100.0)	7/7 (100.0)
High school graduate	38/58 (65.5)	50/60 (83.3)	44/61 (72.1)	24/26 (92.3)	18/21 (85.7)
Some college	11/22 (50.0)	19/27 (70.4)	22/30 (73.3)	20/20 (100.0)	13/16 (81.3)
College or more	18/19 (94.7)	30/33 (90.9)	34/44 (77.3)	25/25 (100.0)	9/10 (90.0)
Unknown	---	1/1 (100.0)	---	---	---
Total	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)	79/81 (97.5)	47/54 (87.0)

Table 100 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 9-1 seems to vary with educational attainment.

Table 101:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	69/89 (77.5)	60/86 (69.8)	49/50 (98.0)	33/38 (86.8)
Non-Medicaid	54/63 (85.7)	50/64 (78.1)	30/31 (96.8)	14/16 (87.5)
Total	123/152 (80.9)	110/150 (73.3)	79/81 (97.5)	47/54 (87.0)

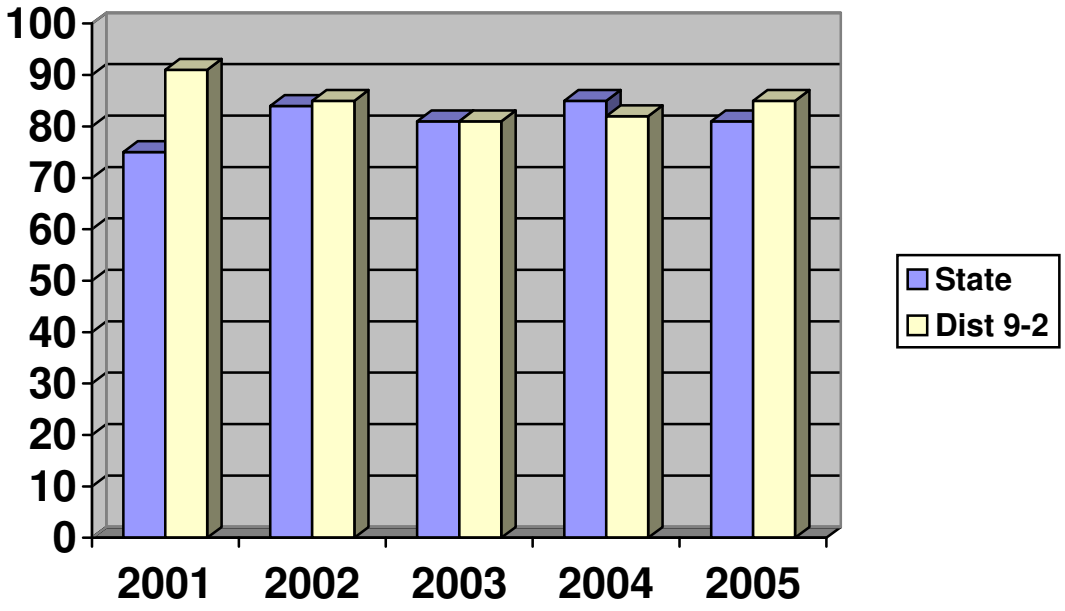
Table 101 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For the 2005 study, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 9-2

The eligible sample from this district included 168 children born in January 2003. From the 168 children, 164 records were located (Response Rate=97.6%). Of the 164 located records, there were no parental refusals leaving a final sample of 164 records.

- **The 4:3:1 immunization coverage estimate is 85.4 percent (140/164)**. This rate is higher than the statewide 4:3:1 immunization rate of 80.7 percent.

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



- **The 4:3:1:3 immunization coverage estimate is 84.1 percent (138/164)**. This rate is higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 77.4 percent (127/164)**. This rate is slightly higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 102:
District Immunization Rates for
Health District 9-2 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	92.4%	86.5%	82.6%	83.0%	86.0%
3 OPV/IPV	92.4%	92.1%	88.4%	90.4%	93.3%
1 MMR	93.1%	94.4%	90.6%	89.6%	92.1%
3 Hib	95.4%	93.3%	86.2%	91.1%	91.5%
3 HepB	95.4%	92.1%	87.7%	90.4%	95.7%
1 Varicella	88.5%	87.6%	91.3%	90.4%	93.3%
3 PCV	---	---	---	39.3%	79.3%
4 PCV	---	---	---	5.2%	28.7%

*PCV data not collected before 2004.

Table 102 reveals the coverage rates of each vaccine series. Coverage rates ranged from 28.7 to 95.7 percent for the 2005 study data.

Table 103 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 103:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	163	99.4%
DTP2/DTaP2	156	95.1%
DTP3/DTaP3	146	89.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	163	99.4%
OPV/IPV2	156	95.1%
OPV/IPV3	72	43.9%
OPV/IPV4	0	0.0%
MMR1	5	3.0%
MMR2	0	0.0%
HIB1	163	99.4%
HIB2	156	95.1%
HIB3	46	28.0%
HIB4	1	0.6%
HIB5	0	0.0%
HEPB1	162	98.8%
HEPB2	157	95.7%
HEPB3	80	48.8%
HEPB4	6	3.7%
VAR1	7	4.3%
VAR2	0	0.0%
PCV1	156	95.1%
PCV2	148	90.2%
PCV3	117	71.3%
PCV4	3	1.8%
PCV5	0	0.0%

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

Table 104:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 9-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent	#/Total (percent	#/Total (percent
White	82/92 (89.1)	50/59 (84.7)	76/104 (73.1)	81/97 (83.5)	98/116 (84.5)
Black	36/38 (94.7)	24/28 (85.7)	25/32 (78.1)	29/37 (78.4)	40/46 (87.0)
Other	1/1 (100.0)	---	1/2 (50.0)	1/1 (100.0)	1/1 (100.0)
Unknown	---	2/2 (100.0)	---	---	1/1 (100.0)
Total	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)	140/164 (85.4)

Table 104 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 104 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rate of children born to white mothers was similar to that of black mothers.

Table 105:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 9-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/12 (100.0)	7/9 (77.8)	1/1 (100.0)	1/1 (100.0)	1/1 (100.0)
Some high school	28/33 (84.8)	17/19 (89.5)	10/17 (58.8)	27/35 (77.1)	36/41 (87.8)
High school graduate	48/55 (87.3)	33/37 (89.2)	39/59 (66.1)	31/39 (79.5)	43/48 (89.6)
Some college	21/21 (100.0)	13/18 (72.2)	26/31 (83.9)	25/29 (86.2)	30/38 (78.9)
College or more	10/10 (100.0)	5/5 (100.0)	26/30 (86.7)	27/31 (87.1)	30/36 (83.3)
Unknown	---	1/1 (100.0)	---	---	---
Total	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)	140/164 (85.4)

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Table 105 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 9-2 varies with level of maternal educational attainment.

Table 106:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	54/62 (87.1)	56/81 (69.1)	82/103 (79.6)	101/116 (87.1)
Non-Medicaid	22/27 (81.5)	46/57 (80.7)	29/32 (90.6)	39/48 (81.3)
Total	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)	140/164 (85.4)

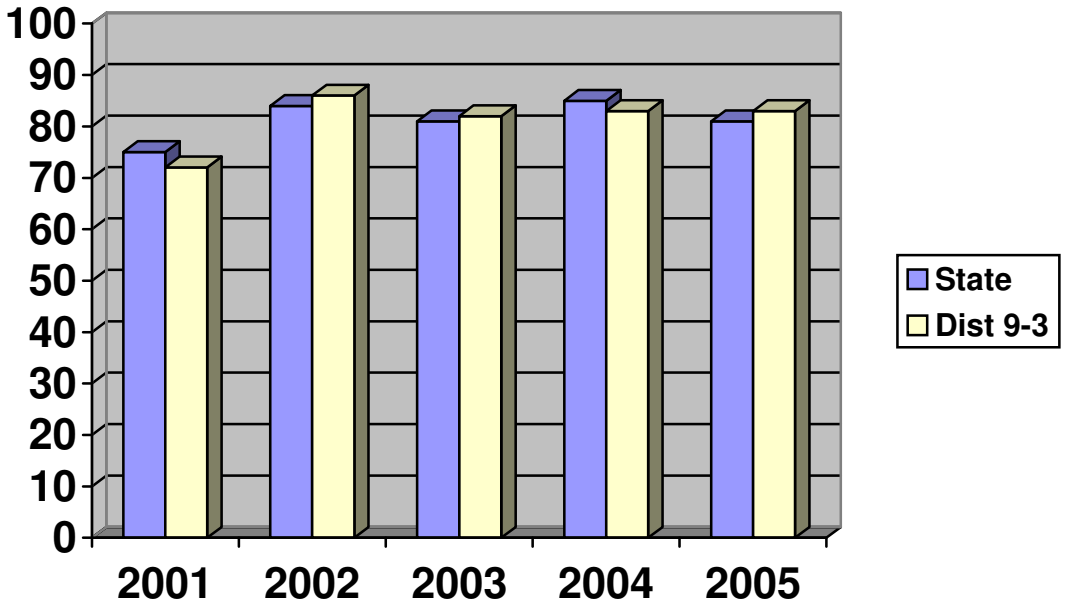
- Table 106 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. The immunization status of the children in District 9-2 varied with maternal Medicaid status.

Individual Health District Report: District 9-3

The eligible sample from this district included 140 children born in January 2003. From the 140 children, 115 records were located (Response Rate=82.1%). Of the 115 located records, there were 0 parental refusals leaving a final sample of 115 records.

- **The 4:3:1 immunization coverage estimate is 82.6 percent (95/115)**. This rate is slightly higher than the statewide 4:3:1 immunization rate of 80.7 percent.

Figure 21: 4:3:1 Coverage for State and District 9-3



- **The 4:3:1:3 immunization coverage estimate is 81.7 percent (94/115)**. This rate is higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 80.9 percent (93/115)**. This rate is also higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 107:
District Immunization Rates for
Health District 9-3 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	71.6%	85.6%	83.0%	83.1%	82.6%
3 OPV/IPV	76.8%	89.8%	89.4%	88.0%	88.7%
1 MMR	80.0%	87.3%	89.4%	89.2%	87.0%
3 Hib	81.1%	91.5%	89.4%	84.3%	88.7%
3 HepB	81.1%	89.0%	86.2%	86.7%	90.4%
1 Varicella	69.5%	83.9%	86.2%	88.0%	87.8%
3 PCV	---	---	---	41.0%	73.9%
4 PCV	---	---	---	15.7%	46.1%

*PCV data not collected before 2004.

Table 107 reveals the coverage rates of each vaccine series. Coverage rates ranged from 46.1 to 90.4 percent for the 2005 study data.

Table 108 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 108:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	107	93.0%
DTP2/DTaP2	107	93.0%
DTP3/DTaP3	99	86.1%
DTP4/DTaP4	3	2.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	107	93.0%
OPV/IPV2	106	92.2%
OPV/IPV3	58	50.4%
OPV/IPV4	0	0.0%
MMR1	4	3.5%
MMR2	0	0.0%
HIB1	107	93.0%
HIB2	106	92.2%
HIB3	50	43.5%
HIB4	4	3.5%
HIB5	0	0.0%
HEPB1	107	93.0%
HEPB2	106	92.2%
HEPB3	62	53.9%
HEPB4	3	2.6%
VAR1	5	4.3%
VAR2	0	0.0%
PCV1	100	87.0%
PCV2	94	81.7%
PCV3	72	62.6%
PCV4	4	3.5%
PCV5	1	0.9%

*Percent = number immunized / sample size
Sample size = 115

Table 109:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 9-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	47/67 (70.1)	61/70 (87.1)	51/62 (82.3)	41/49 (83.7)	56/67 (83.6)
Black	21/28 (75.0)	39/46 (84.8)	21/29 (72.4)	26/31 (83.9)	38/47 (80.9)
Other	---	1/1 (100.0)	3/3 (100.0)	2/3 (66.7)	---
Unknown	---	0/1 (0.0)	---	---	1/1 (100.0)
Total	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)	95/115 (82.6)

Table 109 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 109 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rate of children born to white mothers was similar to that of black mothers.

Table 110:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 9-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/8 (87.5)	3/3 (100.0)	---	1/1 (100.0)	1/1 (100.0)
Some high school	15/23 (65.2)	26/29 (89.7)	15/17 (88.2)	9/13 (69.2)	10/12 (83.3)
High school graduate	23/31 (74.2)	38/48 (79.2)	25/35 (71.4)	34/41 (82.9)	33/42 (78.6)
Some college	15/21 (71.4)	22/24 (91.7)	15/17 (88.2)	8/9 (88.9)	30/38 (78.9)
College or more	8/12 (66.7)	9/11 (81.8)	20/25 (80.0)	17/19 (89.5)	21/22 (95.5)
Unknown	---	3/3 (100.0)	---	---	---
Total	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)	95/115 (82.6)

Table 110 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in the sample in District 9-3 seems to vary with educational attainment.

Table 111:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-3

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	64/73 (87.7)	43/60 (71.7)	42/51 (82.4)	41/51 (80.4)
Non-Medicaid	37/45 (82.2)	32/34 (94.1)	27/32 (84.4)	54/64 (84.4)
Total	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)	95/115 (82.6)

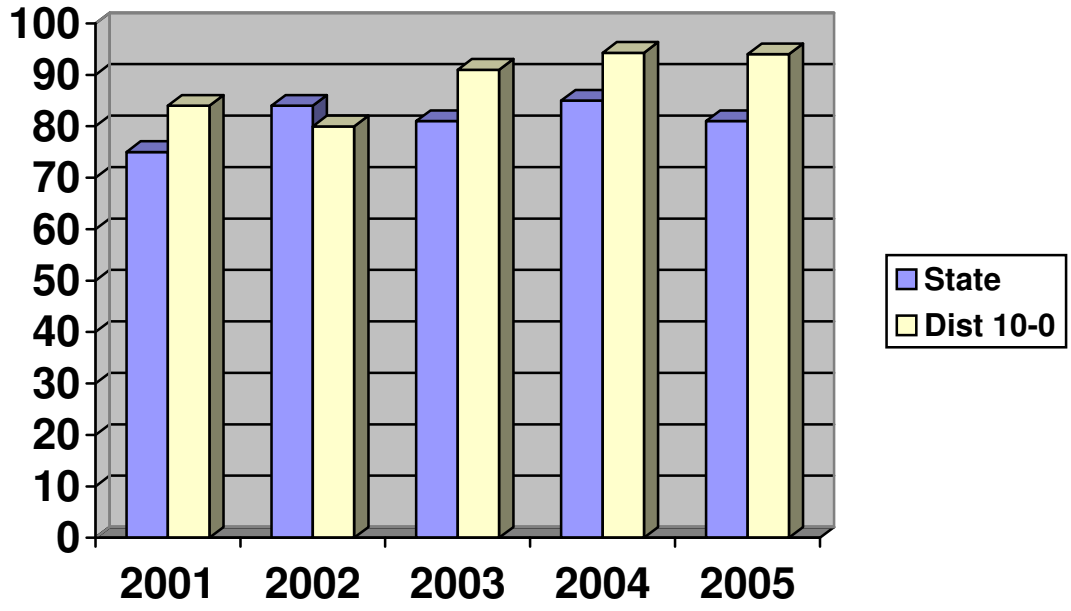
Table 111 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. The immunization status of the children in the sample in District 9-3 varies with maternal Medicaid status.

Individual Health District Report: District 10-0

The eligible sample from this district included 74 children born in January 2003. From the 74 children, 66 records were located (Response Rate=89.2%). Of the 66 located records, there were 4 parental refusals leaving a final sample of 62 records.

- **The 4:3:1 immunization coverage estimate is 93.5 percent (58/62)**. This rate is much higher than the statewide 4:3:1 immunization rate of 80.7 percent.

Figure 22: 4:3:1 Coverage for State and District 10-0



- **The 4:3:1:3 immunization coverage estimate is 93.5 percent (58/62)**. This rate is much higher than the statewide 4:3:1:3 immunization rate of 79.5 percent.
- **The 4:3:1:3:3:1 immunization coverage estimate is 91.9 percent (57/62)**. This rate is also much higher than the statewide 4:3:1:3:3:1 immunization rate of 76.5 percent.

Table 112:
District Immunization Rates for
Health District 10-0 by Study Year*

Vaccine	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates	2005 Adequate Rates
4 DTP/DTaP	85.1%	80.2%	93.2%	94.3%	93.5%
3 OPV/IPV	88.3%	86.0%	93.2%	98.9%	98.4%
1 MMR	89.6%	90.1%	93.8%	97.7%	98.4%
3 Hib	94.2%	86.8%	95.7%	95.5%	98.4%
3 HepB	91.6%	88.4%	95.1%	94.3%	98.4%
1 Varicella	87.0%	86.8%	95.7%	94.3%	98.4%
3 PCV	---	---	---	60.2%	91.9%
4 PCV	---	---	---	25.0%	35.5%

*PCV data not collected before 2004.

Table 112 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 35.5 to 98.4 percent for the 2005 study data.

Table 113 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 113:
2005 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 10-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	62	100.0%
DTP2/DTaP2	61	98.4%
DTP3/DTaP3	59	95.2%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	62	100.0%
OPV/IPV2	61	98.4%
OPV/IPV3	29	46.8%
OPV/IPV4	0	0.0%
MMR1	4	6.5%
MMR2	0	0.0%
HIB1	62	100.0%
HIB2	61	98.4%
HIB3	16	25.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	62	100.0%
HEPB2	61	98.4%
HEPB3	19	30.6%
HEPB4	1	1.6%
VAR1	5	8.1%
VAR2	0	0.0%
PCV1	58	93.5%
PCV2	56	90.3%
PCV3	49	79.0%
PCV4	1	1.6%
PCV5	0	0.0%

*Percent = number immunized / sample size
Sample size = 62

Table 114:
Cross tabulations of Maternal Race and Child Immunization Status for Health District 10-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	98/118 (83.1)	69/88 (78.4)	111/127 (87.4)	63/65 (96.9)	42/45 (93.3)
Black	32/35 (91.4)	26/31 (83.9)	23/30 (76.7)	18/21 (85.7)	15/16 (93.8)
Other	0/1 (0.0)	1/1 (100.0)	4/5 (80.0)	2/2 (100.0)	1/1 (100.0)
Unknown	---	1/1 (100.0)	---	---	---
Total	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)	58/62 (93.5)

Table 114 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 114 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rates of children vary with maternal race.

Table 115:
Cross tabulations of Maternal Educational Level and Child Immunization Status for Health District 10-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/18 (77.8)	5/7 (71.4)	---	---	---
Some high school	28/32 (87.5)	25/29 (86.2)	26/32 (81.3)	12/14 (85.7)	8/9 (88.9)
High school graduate	48/59 (81.4)	35/47 (74.5)	45/59 (76.3)	29/32 (90.6)	15/16 (93.8)
Some college	23/26 (88.5)	12/14 (85.7)	28/31 (90.3)	18/18 (100.0)	13/15 (86.7)
College or more	17/19 (89.5)	20/23 (87.0)	39/40 (97.5)	24/24 (100.0)	22/22 (100.0)
Unknown	---	0/1 (0.0)	---	---	---
Total	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)	58/62 (93.5)

Table 115 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 10-0 seems to vary with maternal educational attainment.

Table 116:
Cross tabulations of Maternal Medicaid Status and Child Immunization Status for Health District 10-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate	2005 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	47/59 (79.7)	71/86 (82.6)	39/43 (90.7)	26/29 (89.7)
Non-Medicaid	50/62 (80.6)	67/76 (88.2)	44/45 (97.8)	32/33 (97.0)
Total	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)	58/62 (93.5)

Table 116 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003, 2004 and 2005 study years. For Health District 10-0, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Section V:
Discussion of Results

Section V: Discussion

Summary

The purpose of the ninth 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 2005. To assess these rates, the study drew an original sample of 3,322 children born in January 2003. The final sample of returned immunization records totaled 3,322. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 3,196. Of these, 2,634 were located and make up the final sample.

The ninth year of the GIS, 2005, measured immunization coverage for children born in 2003 at three levels:*

- 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
- 4:3:1 coverage, defined as 4 DTaP, 3 OPV/IPV, and 1 MMR
- 3:3:1 coverage, defined as 3 DTaP, 3 OPV/IPV, and 1 MMR

Of these three coverage levels, 4:3:1:3:3:1 coverage rates were lowest and 3:3:1 rates the highest. The 4:3:1 measure was used most frequently throughout the study. Although complete 4:3:1 coverage is not considered adequate by the childhood immunization schedule currently recommended, coverage rates have traditionally been calculated using the 4:3:1 measure. Continuing to use this measure for most of the analyses allowed for comparison of data collected in 2001, 2002, 2003, 2004 and 2005. The newer 4:3:1:3:3:1

*It must be remembered that the 2005 study is estimating 2003 rates. The 2004 study is estimating 2002 rates, 2003 study estimated 2001 rates, 2002 study estimated 2000 rates, and the 2001 study estimated rates for 1999.

measure of coverage was added in 1997-98. Therefore, 4:3:1:3:3:1 rates can be compared using study data from the 1997-98 on.

The 2005 results reflect immunization rates for children born in 2003. The results of the study indicate that, of the 2,634 children whose immunization records were located during data collection:

- 76.5 percent of children born in January of 2003 in Georgia were adequately immunized with the 4:3:1:3:3:1 vaccine series.

- 80.7 percent of children born in January of 2003 in Georgia were adequately immunized with the 4:3:1 vaccine series.

  4:3:1 immunization rates in the individual health districts ranged from:
  - 53.3 percent to 97.8 percent in the 2005 study
  - 65.1 percent to 100 percent in the 2004 study
  - 66.0 percent to 94.7 percent in the 2003 study
  - 73.9 percent to 94.3 percent in the 2002 study
  - 42.4 percent to 94.8 percent in the 2001 study
  - 60.7 percent to 94.5 percent in the 1999-00 study

The study investigated where the immunizations are being administered in Georgia (See Appendix E). In the ninth study year, 76.0 percent of the shots found were given by private providers.

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

Conclusions

Immunization rates for the 4:3:1:3:3:1 vaccine series decreased from the 2004 study (81.3 to 76.5). The 2005 Georgia Immunization Study (GIS) measured Varicella rates for the eighth 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 survey trends and monitor rates.

In reviewing the 4:3:1 vaccine series, rates decreased statewide from the 2004 study (85.1 percent) to 80.7 percent in 2005.

The results of the previous four years of the GIS study (2001, 2002, 2003 and 2004) show that immunization-specific coverage rates for the state remained relatively similar during the years when all shots were given, 1999-00, 1997-1998, 1996-97 and 1995-96, respectively.

Strengths

1. This study represents Georgia's ninth 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 vaccine series.
   - Comparison of rates for children born in 2001, 2002, 2003, 2004 and 2005 in Georgia.
4. As a measure of reliability for the data entry process, double data entry was conducted on 5 percent of all records entered. The data entry error rate is approximately 7 percent for the 2005 study.

Limitations

The following sections 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 2003 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 2003, 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 study participants 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 fewer records were found in the public health system and consequently more parents had to be located. Parents in the Metro Atlanta District more often refused to participate (District 3-2). Response rates tended to be lower in the Metro area (Districts 3-2 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 2003 who were residing in the state in 2005. 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 2003 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 2003. 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 2005. 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 117: Data Used for Sample Size Estimates for the 2005 Study. Response rates and immunization coverage levels from the 2004 study were used in the sample size calculation for the 2005 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 2004 study. The final calculated sample size is shown in the last column (Column H) of Table 117. 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 65.6 percent to a high of 99.3 percent, with the average response rate for the state at 84.5 percent. 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 117:
Data Used for Sample Size Estimates for the 2005 Study

A	B	C	D	E	F	G	H
Health District	**Jan 2003 Total Births**	**Jan 2003 Eligible Births**	**2004 4:3:1 Immunization Rates**	**2005 First Sample Estimate**	**2005 Second Sample Estimate**	**Return Rate based on 2004 Eligible Sample**	**2005 Adjusted Sample Size**
1-1	684	669	0.826	221	166	0.952	174
1-2	474	467	0.882	160	119	0.831	143
2-0	665	648	0.999	2	2	0.933	50
3-1	995	973	0.783	261	206	0.765	269
3-2	1,073	1,030	0.783	261	208	0.386	540
3-3	332	322	0.651	349	168	0.394	322
3-4	1,192	1,165	0.935	93	86	0.903	96
3-5	915	900	0.82	227	181	0.552	328
4-0	804	781	0.775	268	200	0.801	249
5-1	141	139	0.855	191	80	0.917	88
5-2	575	558	0.871	173	132	0.804	164
6-0	564	542	0.905	132	106	0.817	130
7-0	437	364	0.884	158	110	0.827	133
8-1	274	269	0.895	144	94	0.938	100
8-2	416	409	0.949	74	63	0.926	68
9-1	330	302	0.975	37	33	0.468	71
9-2	408	396	0.822	225	143	0.865	166
9-3	294	236	0.831	216	113	0.718	157
10-0	436	426	0.943	83	69	0.93	74
State	**11,009**	**10,596**					**3,322**

Figure 23:
Explanations of Table 117
Data Used for Sample Size Estimates
For the 2005 Study

Column A:	**Health District**	District number.
Column B:	**January 2003 Total Births**	Given. Source: DHR Vital Statistics Office.
Column C:	**January 2003 Eligible Births**	
Column D:	**2004 4:3:1 Immunization Rates**	Given. Source: Georgia Birth Cohort Follow-up Study (2004).
Column E:	**First Sample Estimate - 2005 Study**	Formula Used: 3.8416 x (D) (1 – D) / .0025
Column F:	**Second Sample Estimate - 2005 Study**	Adjustment for small size district populations. Formula Used: E / (1 + E/C).
Column G:	**Estimated Return Rate (Based on 2004 Study)**	Given. Source: Georgia Birth Cohort Follow-up Study (2004).
Column H:	**Adjusted Sample Size - 2005 Study**	Formula Used: (Column F) / (Column G)

APPENDIX B:

LIST OF 2005 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

APPENDIX B: LIST OF 2005 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

Health District	Public Health Representative
1-1	Gayle Brannon, R.N., 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	Lisa Germany 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.
5-2	Debbie Liby, R.N.
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 D. Geneine Godfrey, M.P.H.
8-2	Edward W. Sullivan
9-1	Susan Malone, R.N.
9-2	Betty Miller Jessie Jones Doris Wilbon, B.S. Stacy Giles, R.N. JoAnn Deas, R.N. Pat Thomas, R.N. Hollard Phillips, M.S.
9-3	Jennifer Foster, M.S. Deborah A. Dawson, R.N., B.S.N.
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 118 elaborates on the information found on the Varicella vaccine as well as information with regard to 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 percent column is equal to the number of children who had chicken pox divided by the district's final sample size.

Table 118:
2005 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	Percent	Number	Percent	Number	Percent
1-1	136	82.9	143	87.2	0	0.0
1-2	125	93.3	131	97.8	0	0.0
2-0	44	95.7	45	97.8	0	0.0
3-1	151	77.4	161	82.6	0	0.0
3-2	247	77.9	249	78.5	0	0.0
3-3	161	66.0	164	67.2	0	0.0
3-4	84	91.3	85	92.4	0	0.0
3-5	194	84.0	198	85.7	1	0.4
4-0	196	87.5	201	89.7	0	0.0
5-1	64	85.3	73	97.3	0	0.0
5-2	128	92.1	129	92.8	0	0.0
6-0	105	91.3	108	93.9	0	0.0
7-0	101	89.4	106	93.8	0	0.0
8-1	81	92.0	85	96.6	0	0.0
8-2	56	90.3	58	93.5	0	0.0
9-1	50	92.6	51	94.4	0	0.0
9-2	148	90.2	153	93.3	0	0.0
9-3	100	87.0	101	87.8	0	0.0
10-0	60	96.8	61	98.4	0	0.0
Statewide	**2,231**	**84.7**	**2,302**	**87.4**	**1**	**0.04**

Figure 24: 2005 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

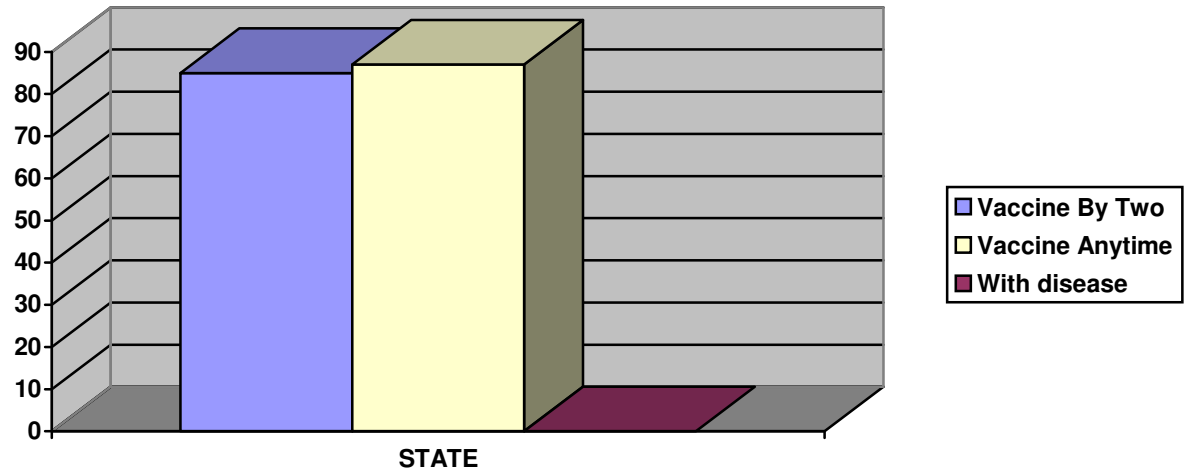


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two-year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

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 119.

Table 119:
Statewide Percentage of Shots by Provider: 2001, 2002, 2003, 2004 and 2005

Provider	2001		2002		2003		2004		2005	
	Total #	%	Total #	%	Total #	%	Total #	%	Total #	%
Public Health Dept	9,472	25.5	8,085	20.3	5,873	16.3	5,449	14.3	6,013	13.2
Private Physician	25,797	69.5	28,667	71.9	26,956	74.8	26,734	70.1	35,065	77.1
Unknown	1,866	5.0	3,112	7.8	3,205	8.9	5,966	15.6	4,407	9.7
Total	**37,135**	**100.0**	**39,864**	**100.0**	**36,034**	**100.0**	**38,149**	**100.0**	**45,485**	**100.0**

As shown in Table 119, in 2005, over 77% of the shots recorded for the sampled children were given by a private provider.

Location of Immunizations by District

Table 120 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 120:
District Specific Percentage of Shots by Provider 2005

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	Percent	# Shots Given	Percent	# Shots Given	Percent	
1-1	281	9.8	2,360	82.3	226	7.9	2,867
1-2	102	4.1	2,316	92.7	81	3.2	2,499
2-0	55	6.5	705	82.8	91	10.7	851
3-1	437	13.1	753	22.5	2,153	64.4	3,343
3-2	430	8.3	4,527	87.3	231	4.4	5,188
3-3	324	8.7	2,841	75.9	577	15.4	3,742
3-4	73	4.4	1,577	94.2	24	1.4	1,674
3-5	820	21.4	2,874	75.1	135	3.5	3,829
4-0	589	15.0	3,147	80.2	187	4.8	3,923
5-1	181	13.8	1,041	79.1	93	7.1	1,315
5-2	375	15.4	1,706	70.2	349	14.4	2,430
6-0	177	8.2	1,912	89.0	61	2.8	2,150
7-0	232	11.7	1,724	86.7	32	1.6	1,988
8-1	220	13.7	1,391	86.3	0	0.0	1,611
8-2	295	26.4	824	73.6	0	0.0	1,119
9-1	139	14.6	814	85.4	0	0.0	953
9-2	878	30.2	1,914	65.9	113	3.9	2,905
9-3	171	8.7	1,759	89.3	39	2.0	1,969
10-0	234	20.7	880	78.0	15	1.3	1,129
State	**6,013**	**13.2**	**35,065**	**77.1**	**4,407**	**9.7**	**45,485**

In Year Nine:

- Seventeen health districts gave more than 50% of the shots 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 the metro-Atlanta area more of the immunizations were administered in the private sector than in the public sector. District 3-1, Cobb County, had a high number of unknown shot locations (64.4 percent).

- **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.

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 121:
Location of Immunizations by District
Four Year Comparison
2002, 2003, 2004, and 2005

District	Public Health Department				Private Physician			
	2002	2003	2004	2005	2002	2003	2004	2005
1-1	20.3	16.4	8.0	9.8	73.2	66.9	73.9	82.3
1-2	13.7	16.2	14.4	4.1	66.9	81.0	76.2	92.7
2-0	24.3	25.2	15.2	6.5	75.0	73.0	85.4	82.8
3-1	19.1	18.4	16.0	13.1	54.4	42.2	42.6	22.5
3-2	24.0	32.1	24.8	8.3	56.5	48.2	69.4	87.3
3-3	26.6	5.4	12.8	8.7	59.1	90.7	69.4	75.9
3-4	7.4	2.1	0.6	4.4	87.9	97.9	95.5	94.2
3-5	11.7	11.6	8.9	21.4	86.4	73.5	45.7	75.1
4-0	19.9	19.7	10.6	15.0	76.5	64.0	50.9	80.2
5-1	29.9	23.1	13.2	13.8	69.0	74.1	76.1	79.1
5-2	26.7	22.2	20.1	15.4	66.2	73.9	61.8	70.2
6-0	24.1	6.4	14.8	8.2	74.6	89.7	85.0	89.0
7-0	22.8	21.7	25.9	11.7	77.1	76.8	71.5	86.7
8-1	20.5	22.4	22.1	13.7	78.7	77.6	77.6	86.3
8-2	22.8	11.7	11.9	26.4	73.9	62.2	86.0	73.6
9-1	17.5	9.2	11.3	14.6	78.2	86.0	87.4	85.4
9-2	36.4	32.6	38.3	30.2	59.7	66.4	60.6	65.9
9-3	16.9	6.2	7.2	8.7	82.2	93.8	88.8	89.3
10-0	19.9	14.7	9.4	20.7	80.1	79.6	88.6	78.0
State Totals	**20.3**	**16.3**	**14.3**	**13.2**	**71.9**	**74.8**	**70.1**	**77.1**

Four-Year Comparison: Summary of Table 121

In 2002 20.3% of the shots were received at the public health department
71.9% of the shots were given in the private sector
7.8% of the shot locations were unknown

In 2003 16.3% of the shots were received at the public health department
74.8% of the shots were given in the private sector
8.9% of the shot locations were unknown

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

APPENDIX F:

MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

APPENDIX F: MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

Margins of error were calculated for all statewide and district immunization coverage rates, including 4:3:1:3:3:1 rates, 4:3:1 rates, and 3:3:1 rates. These margins of error can be found in Tables 122-124. The formula used to calculate the margins of error in these tables was:

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

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 immunization rate is as follows:

- With 95% confidence, the true statewide 4:3:1 immunization rate for infants born in 2003 is between 79.2 and 82.2 percent.

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

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

Table 122:
Margins of Error for 2005
Statewide and District 4:3:1:3:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1+3 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	164	76.2	+/- 6.5	69.7 – 82.7
1-2	134	91.8	+/- 4.6	87.2 – 96.4
2-0	46	91.3	+/- 8.1	83.2 – 99.4
3-1	195	68.2	+/- 6.5	61.7 – 74.7
3-2	317	70.7	+/- 5.0	65.7 – 75.7
3-3	244	47.1	+/- 6.3	40.8 – 53.4
3-4	92	88	+/- 6.6	81.4 – 94.6
3-5	231	68	+/- 6.0	62 – 74
4-0	224	79.5	+/- 5.3	74.2 – 84.8
5-1	75	84	+/- 8.3	75.7 – 92.3
5-2	139	84.9	+/- 6.0	78.9 – 90.9
6-0	115	88.7	+/- 5.8	82.9 – 94.5
7-0	113	85.8	+/- 6.4	79.4 – 92.2
8-1	88	92	+/- 5.7	86.3 – 97.7
8-2	62	83.9	+/- 9.1	74.8 – 93
9-1	54	87	+/- 9.0	78 – 96
9-2	164	77.4	+/- 6.4	71 – 83.8
9-3	115	80.9	+/- 7.2	73.7 – 88.1
10-0	62	91.9	+/- 6.8	85.1 – 98.7
Statewide Rate (weighted)	**2,634**	**76.5**	**+/- 1.6**	**74.9 – 78.1**

Table 123:
Margins of Error for 2005
Statewide and District 4:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	164	79.5	+/- 5.7	73.8– 85.2
1-2	134	97	+/- 2.9	94.1 – 99.9
2-0	46	97.8	+/- 4.2	93.6 – 102
3-1	195	75.9	+/- 6.0	69.9 – 81.9
3-2	317	72.6	+/- 4.9	67.7 – 77.5
3-3	244	53.3	+/- 6.3	47 – 59.6
3-4	92	90.2	+/- 6.1	84.1 – 96.3
3-5	231	72.3	+/- 5.8	66.5 – 78.1
4-0	224	81.6	+/- 5.1	76.5 – 86.7
5-1	75	94.7	+/- 5.1	89.6 – 99.8
5-2	139	87.8	+/- 5.4	82.4 – 93.2
6-0	115	93.9	+/- 4.4	89.5 – 98.3
7-0	113	90.3	+/- 5.5	84.8 – 95.8
8-1	88	94.3	+/- 4.8	89.5 – 99.1
8-2	62	85.5	+/- 8.8	76.7 – 94.3
9-1	54	87	+/- 9.0	78 – 96
9-2	164	85.4	+/- 5.4	80 – 90.8
9-3	115	82.6	+/- 6.9	75.7 – 89.5
10-0	62	93.5	+/- 6.1	87.4 – 99.6
Statewide Rate (weighted)	**2,634**	**80.7**	**+/- 1.5**	**79.2 – 82.2**

Table 124:
Margins of Error for 2005
Statewide and District 3:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	3:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	164	84.8	+/- 5.5	79.3 – 90.3
1-2	134	97.8	+/- 2.5	95.3 – 100.3
2-0	46	97.8	+/- 4.2	93.6 – 102
3-1	195	79	+/- 5.7	73.3 – 84.7
3-2	317	76.7	+/- 4.7	72 – 81.4
3-3	244	59.8	+/- 6.2	53.6 – 66
3-4	92	90.2	+/- 6.1	84.1 – 96.3
3-5	231	78.8	+/- 5.3	73.5 – 84.1
4-0	224	84.8	+/- 4.7	80.1 – 89.5
5-1	75	94.7	+/- 5.1	89.6 – 99.8
5-2	139	90.6	+/- 4.9	85.7 – 95.5
6-0	115	94.8	+/- 4.1	90.7 – 98.9
7-0	113	92	+/- 5.0	87 – 97
8-1	88	96.6	+/- 3.8	92.8 – 100.4
8-2	62	88.7	+/- 7.9	80.8 – 96.6
9-1	54	92.6	+/- 7.0	85.6 – 99.6
9-2	164	90.2	+/- 4.6	85.6 – 94.8
9-3	115	84.3	+/- 6.6	77.7 – 90.9
10-0	62	98.5	+/- 3.0	95.5 – 101.5
Statewide Rate (weighted)	**2,634**	**84.2**	**+/- 1.4**	**82.8 – 85.6**