GEORGIA **IMMUNIZATION STUDY**

1999-2000 Final Report

A collaboration between
Georgia Department
of Human Resources
Division of Public Health
Epidemiology Branch
Immunization Program
Georgia Public Health Districts

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Acknowledgments

The Georgia Department of Human Resources, Division of Public Health, Epidemiology Program 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.

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 repeat the assessment for a fourth year and compare our efforts with theirs.

A special note of thanks to Mr. Mike Chaney, Georgia Immunization Program Manager, for his support and leadership during this study.

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PROJECT OVERVIEW

SECTION I: Project Overview and Introduction

The Division of Public Health, Epidemiology Branch, Immunization Program and Health Districts collaborated on the 2000 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 Rollins School of Public Health, Emory University did the first three years of the study. Immunization rates for the first year of the study evaluated rates for children born in 1994. The second year of the study estimated rates for children born in 1995. The third year examined rates for children born in 1996. The fourth year, 1999-00 looked at immunization rates for infants born in 1997 and are the rates reported here. They are compared throughout this report with rates for 1996, 1995 and 1994 found in the previous three 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 Co-Coordinator was Carol A. Hoban, MS, MPH. Del Carvell was the Project Coordinator. Ms. Hoban performed data entry and analysis.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in October 1999. During November 1999, 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, 1999.

At the beginning of December, a training session for the public health representatives was held in Forsyth, Georgia. Data were collected from January 3, 2000 through July 5, 2000. (Limited data collection continued on some difficult

to obtain records through the end of July 2000). The 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	November, 1999
Initial notification of public health community Immunization Coordinators Health Directors	November, 1999
Initial notification of private health community	December 2, 1999
One day training for public health representatives	December 6, 1999
Data collection period	January – July 2000
Data entry period	March - October 2000
Double data entry of 5% of data forms	November, 2000
Final data cleaning and analysis of data	December 2000 – January 2001
Final Report	February 2001

[*] Throughout this report, we refer to study years one, two, three, and four as 1996-97, 1997-98,1998-99 and 1999-00 respectively. These results from these four study years refer to rates for 1994, 1995, 1996, and 1997 respectively.

Data collection was extended beyond July 5, 2000 in some areas to allow for follow-up of records for which the public health representatives had some information but needed more time to complete.

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 where the immunizations were given (public or private provider) is included in Appendix E. Margins of error for immunization coverage rates are included in Appendix F.

SECTION II:
METHODOLOGY

SECTION II: METHODOLOGY

Research Design

The fourth 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 November 1997. In this retrospective study, all of the immunizations occurred prior to the initiation of the project. The data collection time period did not include the two years during which the children were receiving their shots. The study design allowed for the calculation of immunization rates for children who turned two in November 1999. Identifying information about the children and their parents was collected from birth certificate data.

Target and Sample Populations

The target population of the fourth year of the Georgia Immunization Study included all two-year-old children who were born in the State of Georgia in 1997. A sample size of 4,328 children born in the month of November 1997 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 from the total births in the state for November 1997. 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 gender
- Infant's date of birth

- Infant's address
- Mother's first, middle, and last name
- Father's first, middle, and last name (if available)

Preparation for Data Collection

Public health representatives in each health district completed the data collection procedures. Division of Public Health staff trained the representatives in Forsyth, Georgia on December 6th, 1999. 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 was revised by the staff at the Georgia Division of Public Health for use in year four.

During the training, State representatives gave instructions on the data collection process, including confidentiality and data collection etiquette and recording data onto the data collection forms.

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, and two Varicella 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. Although immunization data are in the public domain, and law does not require consent forms, many private physicians refused to provide information without a signed consent from the parent.

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 (ex: 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 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 year four by Ms. Hoban.

Data Entry

The principal investigator 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 October 2000. 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 90.0% was found.

Analysis Plan

The plan for the analysis was very similar to that used in the three previous years. Additionally, trends from all four 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. Through Epi Info a comprehensive analysis of the state's immunization coverage was completed.

The analyses produced by the project are quantitative in nature. 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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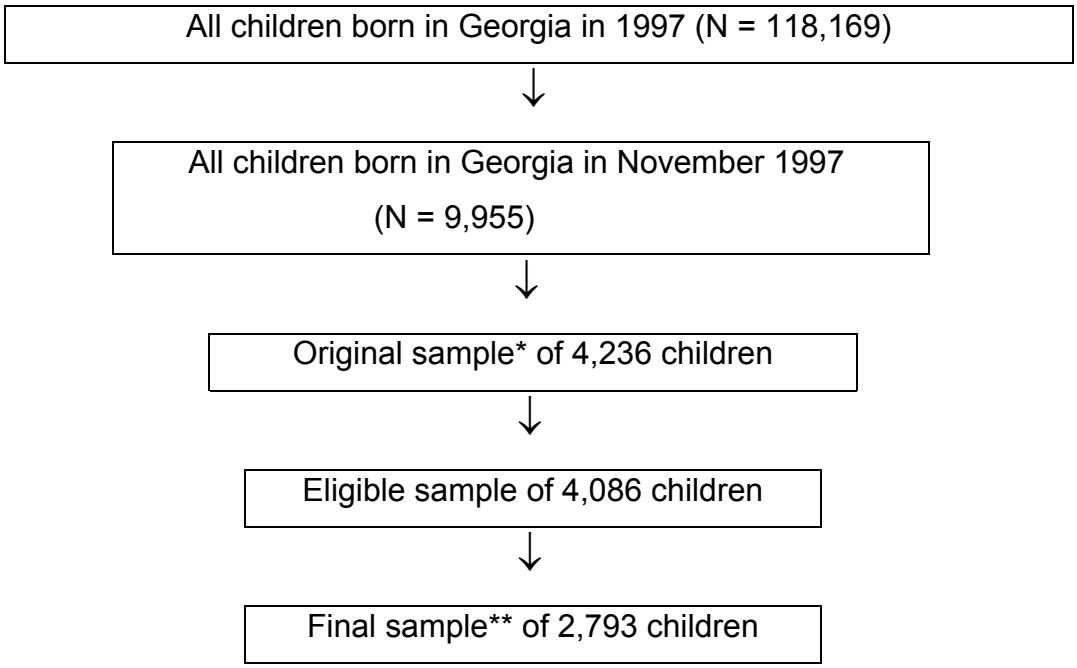
Sampling

The sample of 4,328 children was drawn from 9,955 children born in Georgia in November 1997. A total of 118,169 children were born in Georgia during 1997. The final sample of returned immunization records included 4,236 (91 records were lost in the data abstraction process) and will hereafter be referred to as the original sample*.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 4,086. (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 4,086 children in the eligible sample, 2,793 children were located and 1,293 children never were located. The resulting final sample** consisted of 2,793 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 children used in the 1999-2000 study also excludes records that were supposed to be transferred to another health district due to recording inaccuracies at the state. The final sample of 2,793 children represented 68.4 percent of the eligible sample.

Table 2: Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	**4,236**	**100.0%**
Deceased	4	0.1%
Adopted	13	0.3%
Moved out of state	111	2.6%
Military	22	0.5%
Eligible Sample	**4,086**	96.5%
Eligible Sample	**4,086**	**100.0%**
Records Not Located /Eligibility Unknown *	1,293	31.6%
Final Sample (Located Records)**	**2,793**	68.4%

* **Records Not Located / Eligibility Unknown** - This category refers to records where no evidence of a child's existence was found beyond birth certificate data 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) at least one shot date was found;
b) a provider refused to participate in the study;
c) no immunization record was available due to documented religious objection;
d) a provider could not be found (this implies contact with a parent, who would have provided evidence of the child's existence);
e) no immunization record was available due to documented medical exemption;
f) 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 1999-2000 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 2, 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 46.7 percent to a high of 99.0 percent, with a statewide average response rate of 72.2 percent.

Table 3: 1999-00 Eligible Sample, Sample and Response Rates by District

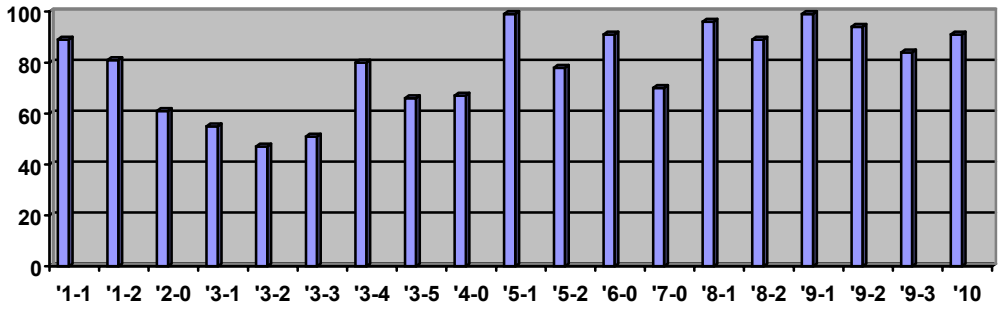
Health District	Eligible Sample (Number)	Sample* (Number Located)	Response Rate ** (% of Eligible Sample located)
1-1	192	170	88.5%
1-2	186	150	80.6%
2-0	230	140	60.9%
3-1	360	197	54.7%
3-2	480	224	46.7%
3-3	177	91	51.4%
3-4	482	386	80.1%
3-5	370	244	65.9%
4-0	300	201	67.0%
5-1	83	83	100.0%
5-2	71	55	77.5%
6-0	53	48	90.6%
7-0	247	174	70.4%
8-1	116	111	95.7%
8-2	179	160	89.4%
9-1	134	132	98.5%
9-2	146	137	93.8%
9-3	91	76	83.5%
10-0	189	171	90.5%
State	**4,086**	**2,950**	**72.2%**

*sample includes parental refusals and records transferred to other health district

**number located / eligible sample

Figure 2

1999-2000 Response Rates by District and Statewide



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 1999-00 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	170	4	2.4
1-2	150	2	1.3
2-0	140	9	6.4
3-1	197	0	0
3-2	224	16	7.1
3-3	91	1	1.1
3-4	386	18	4.7
3-5	244	12	4.9
4-0	201	9	4.5
5-1	83	1	1.2
5-2	55	0	0
6-0	48	0	0
7-0	170	1	0.6
8-1	111	2	1.8
8-2	160	3	1.9
9-1	132	0	0
9-2	137	1	0.7
9-3	76	3	3.9
10-0	171	4	2.3
Total	2,950	86	2.9

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 2,793 children (children located). All immunization data represents documented shot dates prior to the child's second birthday except for dates of the Varicella vaccine. In order to compare this year's data to the previous study data, Varicella immunization rates represent documentation of Varicella vaccination regardless of the child's age.

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" status — a child has received four DTP/DaTP, three OPV/IPV, one MMR, three Hib, three Hep B by age two, and one Varicella at anytime

- "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 by age two.

- "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 by age two.

Table 5 illustrates the percent of the children in the final samples in the last three years of this study 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.

Of the 2,793 children who were located in 1990-00, 56.3 percent were adequately immunized at the 4:3:1+3 level. This percent of adequately immunized children increased from the 41.9 percent in 1998-99.

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

Immunization Status	1997-98		1998-99		1999-00	
	Number	Percent	Number	Percent	Number	Percent
Adequately Immunized	474	16.0	1,360	41.9	1,573	56.3
Inadequately Immunized	2,078	84.0	2,100	58.1	1,220	43.7

Note: State rates based on data weighted by health district. 4:3:1+3 rate not measured in the 1996-97 study.

Table 6 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. In 1996-97, the number of adequately immunized children comprised 79.6 percent of the sample as compared to 71.3 percent in 1997-98. The number of adequately immunized children increased from 71.3 percent in 1997-98 to 73.3 percent in 1998-99 and to 78.8% in the 1999-00 study.

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

Immunization Status	1996-97		1997-98		1998-99		1999-00	
Adequately Immunized	2,369	79.6%	1,821	71.3%	2,511	73.3%	2,202	78.8%
Inadequately Immunized	601	20.4%	731	28.7%	949	26.7%	591	21.2%

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

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

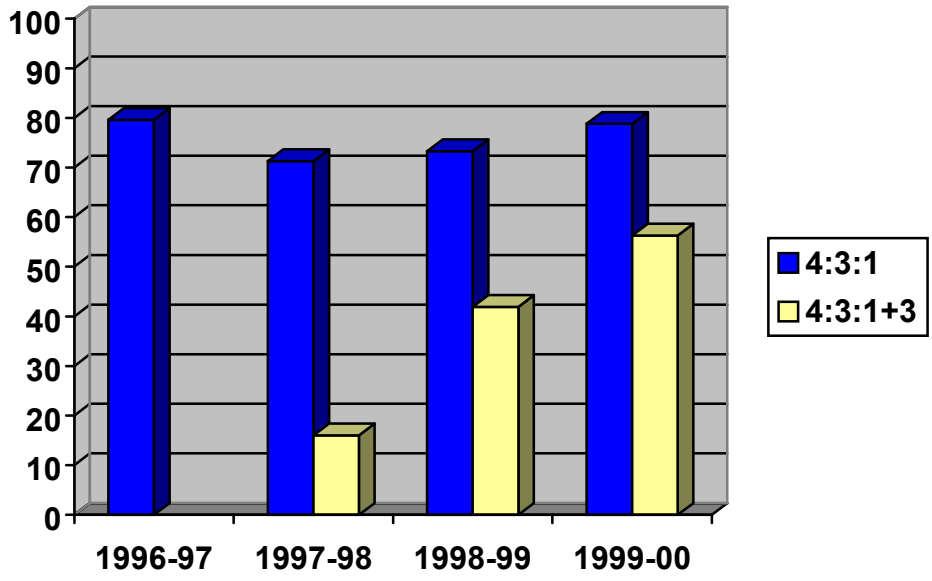


Figure 3 reveals the statewide 4:3:1 coverage rates for the 1996-97, 1997-98, 1998-99, and 1999-00 studies. The figure also shows statewide 4:3:1+3 vaccination coverage for the 1997-98, 1998-99, and 1999-00 studies. Varicella was not recorded for the 1996-97 study, therefore the 4:3:1+3 rate is not applicable for the first study. For more information on Varicella rates see Appendix D.

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 7 indicates the 3:3:1 immunization coverage rate for the state decreased from 83.6 percent in 1996-97 to 78.1 percent in 1997-98 and increased only slightly to 78.4 percent in 1998-99. However, in the 1999-00 study the 3:3:1 coverage rate increased to 82.0 percent.

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

Immunization Status	1996-97		1997-98		1998-99		1999-00	
Adequate	2,482	83.6%	2,005	78.1%	2,685	78.4%	2,290	82.0%
Inadequate	488	16.4%	547	21.9%	775	21.6%	503	18.0%

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

The statewide immunization status for each individual vaccine is located in Table 8. This table illustrates the number and percent of children who were adequately immunized for each of the recommended vaccines. Vaccines which are part of the 4:3:1+3 shot series are shown here. In 1997-98, 1998-99, and 1999-00 none of the immunization rates met the state goal of 90 percent coverage, however, the coverage rate for the Varicella vaccine dramatically increased from 19.0 percent in 1997-98 to 47.1 percent in 1998-99 and again to 64.3 percent in 1999-00. (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 8: State Immunization Status by Individual Vaccine by Study Year

Vaccine	1996-97		1997-98		1998-99		1999-00	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
3 DTP/DTaP	2,700	90.9	2,227	87.3	2,912	84.9	2,491	89.2
4 DTP/DTaP	2,433	81.9	1,861	72.9	2,545	74.2	2,233	79.9
3 OPV/IPV	2,677	90.1	2,186	85.4	2,864	83.6	2,358	84.4
1 MMR	2,533	85.3	2,063	80.8	2,752	80.2	2,363	84.6
3 Hib	2,508	84.4	2,141	83.6	2,866	83.6	2,441	87.4
3 Hep B	2,464	83.0	2,133	83.2	2,839	82.9	2,422	86.7
1 Varicella*	NA	NA	555	19.0	1,620	47.1	1,795	64.3

* Immunization coverage status for the Varicella vaccine was not measured in the 1996-97 study.
Note: State rates based on data weighted by health district.

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 9 provides an overview of the immunization status of the children in the final sample of the 1997-98, 1998-99 and 1999-00 studies at one year of age, looking at coverage status by individual doses of vaccine.

Table 9:
Statewide Immunization Status by Individual Vaccines at 12 Months of Age

Vaccine	Number Immunized 97-98	Percent* 97-98	Number Immunized 98-99	Percent* 98-99	Number Immunized 99-00	Percent* 99-00
DTP/DTaP1	2,404	94.2%	3,071	88.8%	2,588	92.7%
DTP/DTaP2	2,282	89.4%	2,976	86.0%	2,507	89.8%
DTP/DTaP3	2,049	80.3%	2,712	78.4%	2,327	83.3%
DTP/DTaP4	61	2.4%	81	2.30%	25	0.90%
DTP/DTaP5	0	0.0%	0	0.00%	1	0.0004%
OPV/IPV1	2,389	93.6%	3,063	88.5%	2,586	92.6%
OPV/IPV2	2,268	88.9%	2,965	85.7%	2,493	89.3%
OPV/IPV3	1,850	72.5%	2,411	69.7%	742	26.6%
OPV/IPV4	9	0.4%	8	0.20%	7	00.3%
MMR1	83	3.3%	206	6.00%	117	4.20%
MMR2	4	0.2%	1	0.03%	1	0.0004%
HIB1	2,324	91.1%	3,024	87.4%	2,569	92.0%
HIB2	2,190	85.8%	2,925	84.5%	2,482	88.9%
HIB3	1,935	75.8%	2,612	75.5%	2,220	79.5%
HIB4	48	1.90%	99	2.90%	61	2.20%
HIB5	0	0.00%	0	0.00%	1	0.0004%
HEPB1	2,404	94.2%	3,068	88.7%	2,616	93.7%
HEPB2	2,283	89.5%	2,961	85.7%	2,527	90.5%
HEPB3	1,825	71.5%	2,419	69.9%	2,087	74.7%
HEPB4	21	0.80%	15	0.40%	23	0.80%
VAR1	37	1.5%	160	4.60%	150	5.40%
VAR2	0	0.0%	0	0.00%	0	0.00%

* Percents are calculated as (Number Immunized/Sample Size).
Sample Size for 1997-98 study = 2,552 Sample Size for 1998-99 study = 3,460 Sample size for the 1999-00 study = 2,793.

Table 10 shows the 1996-97, 1997-98, 1998-99, and 1999-00 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 1999-00 margin of error for each health district ranges from +/- 2.3 percent to +/- 12.8 percent. The District level 1999-00 4:3:1 immunization rates range from 60.7 percent to 94.5 percent. Of the 19 health districts, two had an immunization coverage rate over 90 percent and six districts had 1999-00 coverage rates between 80 and 90 percent. The immunization rates increased in 12 of the 19 health districts from 1997-98 to 1998-99 and again in 1999-00. The following summary highlights the changes in 4:3:1 coverage rates between 1998-99 and 1999-00:

- Coverage increased 30 percent in 1 district (District 3-4)
- Coverage increased between 15 and 25 percent in four districts (District 2-0, 3-1, 3-2, and 9-3)
- Coverage increased between 5 and 15 percent in three districts (District 4-0, 7-0, and 8-1)
- Coverage increased between 0 and 5 percent in four districts (District 1-2, 3-5, 5-1, and 9-2)
- Coverage fell between 10 and 25 percent in four districts (Districts 1-1, 3-3, 5-2, and 6-0)
- Coverage fell between 5 and 10 percent in two districts (Districts 9-1and 10)
- Statewide 4:3:1 rates increased by 5.5 percent.

Table 10:
4:3:1 District and State Coverage Rates by Study Year

District	1996-97		1997-98		1998-99		1999-00	
	Percent	Margin of Error	Percent	Margin of Error	Percent	Margin of Error	Percent	Margin of Error
1-1	90.2	+/- 4.4%	81.5	+/- 6.6%	78.2	+/- 6.8%	67.5	+/- 7.1%
1-2	86.6	+/- 5.6%	71.7	+/- 8.3%	74.9	+/- 6.4%	75.3	+/-7.0%
2-0	90.1	+/- 4.4%	78.9	+/- 9.2%	66.7	+/- 6.8%	88.5	+/-5.5%
3-1	72.9	+/- 6.1%	75.3	+/- 5.6%	58.1	+/- 6.5%	75.6	+/-6.1%
3-2	70.0	+/- 5.8%	49.7	+/- 7.1%	53.8	+/- 5.4%	69.6	+/-6.5%
3-3	50.0	+/- 8.1%	85.5	+/- 5.4%	76.3	+/- 7.1%	60.7	+/-10.4%
3-4	84.1	+/- 5.7%	57.4	+/- 9.6%	65.0	+/- 5.6%	94.5	+/-2.3%
3-5	75.6	+/- 5.7%	58.3	+/- 7.6%	63.0	+/- 5.5%	64.9	+/-6.3%
4-0	85.4	+/- 5.5%	58.7	+/- 9.5%	67.5	+/- 5.6%	79.7	+/-5.7%
5-1	82.7	+/- 8.6%	78.3	+/- 7.8%	87.1	+/- 7.1%	91.3	+/-6.2%
5-2	75.9	+/- 5.9%	71.8	+/- 7.2%	94.5	+/- 2.8%	83.6	+/-9.8%
6-0	83.2	+/- 6.0%	76.6	+/- 7.1%	96.1	+/- 2.8%	72.3	+/-12.8%
7-0	74.8	+/- 7.8%	71.8	+/- 5.8%	67.9	+/- 7.8%	77.1	+/-6.3%
8-1	88.8	+/- 5.5%	88.4	+/- 6.8%	80.4	+/- 8.1%	86	+/-6.6%
8-2	91.9	+/- 3.9%	81.4	+/- 9.1%	83.8	+/- 6.1%	83.7	+/-5.9%
9-1	80.0	+/- 6.4%	66.4	+/- 7.8%	80.4	+/- 6.5%	78.5	+/-7.1%
9-2	92.2	+/- 4.9%	80.5	+/- 8.6%	83.5	+/- 6.6%	85	+/-6.1%
9-3	69.4	+/- 8.1%	68.6	+/- 7.7%	60.6	+/- 9.2%	82.2	+/-8.8%
10-0	79.0	+/- 7.8%	73.6	+/- 7.6%	78.9	+/- 6.1%	73.4	+/-7.0%
State	**79.6**	**+/- 1.5%**	**71.3**	**+/- 1.8%**	**73.3**	**+/- 1.5%**	**78.8**	**+/-1.5%**

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

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

Tables 11-16 present the state and district rates for each individual vaccine during the 1996-97, 1997-98, 1998-99, and 1999-00 data collection periods.

As shown in Table 11, 1999-00 district immunization rates for the DTP/DTaP vaccines ranged from 63.1 percent to 94.8 percent, with a statewide rate of 79.9 percent receiving all four doses. This statewide DTP/DTaP rate was an increase from the 1997-98 and 1998-999 rates, but not as high as the 1996-97 rate of 81.9 percent.

Table 11:
State and District Immunization Rates for DTP/DTaP by Study Year

District	1996-97 Rates 4 DTP/DTaP	1997-98 Rates 4 DTP/DTaP	1998-99 Rates 4DTP/DTaP	1999-00 Rates 4DTP/DTaP
1-1	90.2%	83.0%	78.2%	67.5%
1-2	85.9%	72.6%	75.4%	77.4%
2-0	91.2%	80.3%	67.7%	89.3%
3-1	73.4%	77.9%	59.0%	77.7%
3-2	72.1%	51.8%	55.1%	71.1%
3-3	69.6%	86.1%	76.3%	63.1%
3-4	84.7%	59.4%	66.4%	94.8%
3-5	79.2%	61.3%	64.4%	66.2%
4-0	86.1%	61.5%	69.0%	79.7%
5-1	84.0%	79.2%	87.1%	91.3%
5-2	77.4%	72.5%	96.5%	83.6%
6-0	83.9%	76.6%	96.1%	74.5%
7-0	78.2%	73.1%	69.3%	77.1%
8-1	90.4%	88.4%	81.5%	86.9%
8-2	94.6%	81.4%	84.5%	85.6%
9-1	79.3%	67.1%	80.4%	80.8%
9-2	91.3%	84.1%	83.5%	88.0%
9-3	72.6%	72.1%	64.2%	82.2%
10-0	79.0%	74.4%	78.9%	74.7%
State	**81.9%**	**72.9%**	**74.2%**	**79.9%**

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

Table 12 shows the 1996-97, 1997-98, 1998-99, and 1999-00 state and district rates for the OPV/IPV vaccines. The 1999-00 district coverage rates for these vaccines varied between 71.4 percent and 96.4 percent. The 1999-00 statewide immunization rate for OPV/IPV was 84.4 percent, higher than the 83.6 percent coverage rate reported in 1998-99, but lower than the 1996-97 rate of 90.1 percent and the 1997-98 rate of 85.4 percent.

Table 12:
State and District Immunization Rates for OPV/IPV by Study Year

District	1996-97 Rates 3 OPV/IPV	1997-98 Rates 3 OPV/IPV	1998-99 Rates 3 OPV/IPV	1999-00 Rates 3 OPV/IPV
1-1	96.0%	88.1%	90.8%	72.3%
1-2	93.7%	88.5%	86.9%	82.2%
2-0	96.7%	93.4%	73.7%	88.5%
3-1	84.7%	84.4%	72.5%	79.3%
3-2	83.8%	75.4%	64.9%	76.8%
3-3	75.0%	88.5%	93.5%	71.4%
3-4	91.7%	64.4%	72.9%	96.4%
3-5	89.6%	77.9%	76.4%	75.7%
4-0	93.0%	83.7%	80.2%	85.9%
5-1	89.3%	90.6%	92.9%	93.8%
5-2	86.9%	85.9%	98.0%	87.3%
6-0	91.3%	91.2%	98.3%	85.1%
7-0	88.2%	93.2%	83.2%	85.9%
8-1	97.6%	94.2%	94.6%	87.9%
8-2	97.3%	88.6%	90.1%	90.8%
9-1	93.3%	80.7%	87.4%	88.5%
9-2	95.7%	92.7%	93.4%	90.2%
9-3	85.5%	84.3%	77.1%	86.3%
10-0	85.7%	89.1%	86.5%	76.0%
State	**90.1%**	**85.4%**	**83.6%**	**84.4%**

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

Table 13 shows the 1996-97, 1997-98, 1998-99, and 1999-00 state and district rates for MMR. The 1999-00 district rates for MMR ranged from a low of 70.2 percent to a high of 96.4 percent, with a statewide rate of 84.6 percent coverage. This statewide rate for the MMR vaccine increased from the 1997-98 rate of 80.4 percent.

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

District	1996-97 Rates 1 MMR	1997-98 Rates 1 MMR	1998-99 Rates 1 MMR	1999-00 Rates 1 MMR
1-1	95.4%	90.4%	86.6%	73.5%
1-2	91.5%	85.8%	84.6%	83.6%
2-0	93.4%	85.5%	72.0%	90.1%
3-1	77.8%	78.4%	64.0%	81.9%
3-2	80.4%	71.2%	65.8%	77.8%
3-3	54.1%	88.5%	84.9%	70.2%
3-4	87.9%	63.4%	69.7%	96.4%
3-5	84.6%	68.1%	73.3%	71.6%
4-0	91.1%	69.2%	73.1%	84.9%
5-1	88.0%	84.0%	91.8%	96.3%
5-2	81.4%	80.5%	95.7%	90.9%
6-0	84.6%	84.7%	98.3%	87.2%
7-0	83.2%	92.3%	83.2%	85.3%
8-1	91.2%	95.3%	89.1%	90.7%
8-2	94.6%	85.7%	91.5%	88.9%
9-1	90.7%	72.1%	86.7%	85.4%
9-2	93.0%	87.8%	85.1%	91.0%
9-3	78.2%	76.4%	67.9%	87.7%
10-0	81.9%	82.2%	84.8%	77.3%
State	**85.3%**	**80.4%**	**80.2%**	**84.6%**

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

As shown in Table 14, 1999-00 district immunization rates for the Hib vaccine varied between 76.5 and 96.4 percent. The statewide Hib coverage rate in 1999-00 was 87.4 percent, an increase from the 1998-99 statewide rate of 83.6 percent

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

District	1996-97 Rates 3 Hib	1997-98 Rates 3 Hib	1998-99 Rates 3 Hib	1999-00 Rates 3 Hib
1-1	92.5%	88.9%	90.8%	76.5%
1-2	80.3%	89.4%	88.0%	86.3%
2-0	96.7%	88.2%	73.1%	88.5%
3-1	75.4%	83.5%	71.6%	85.0%
3-2	76.3%	69.1%	65.2%	79.9%
3-3	64.9%	87.9%	93.5%	79.8%
3-4	80.3%	59.4%	70.4%	97.5%
3-5	84.6%	74.8%	76.7%	77.0%
4-0	91.1%	79.8%	81.0%	88.5%
5-1	84.0%	89.6%	94.1%	96.3%
5-2	85.4%	81.2%	98.0%	96.4%
6-0	87.2%	92.0%	98.3%	87.2%
7-0	72.3%	88.5%	85.4%	85.3%
8-1	96.8%	96.5%	94.6%	92.5%
8-2	85.5%	87.1%	90.8%	92.8%
9-1	93.3%	81.4%	86.0%	91.5%
9-2	92.2%	93.9%	93.4%	95.5%
9-3	83.9%	85.7%	78.0%	89.0%
10-0	86.7%	88.4%	87.7%	79.9%
State	**84.4%**	**83.6%**	**83.6%**	**87.4%**

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

Table 15 reports the statewide and district immunization coverage rates for the Hepatitis B vaccine. In 1999-00, the district coverage rates varied from a low of 76.2 percent to 97.5 percent. The 1999-00 statewide rate of 86.7 percent for the Hepatitis B vaccine was higher than the 1997-98 statewide rate of 82.9 percent.

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

District	1996-97 Rates 3 Hep B	1997-98 Rates 3 Hep B	1998-99 Rates 3 Hep B	1999-00 Rates 3 Hep B
1-1	94.8%	92.6%	88.0%	76.5%
1-2	86.6%	85.8%	86.3%	86.3%
2-0	92.8%	88.2%	73.1%	89.3%
3-1	74.4%	82.3%	72.1%	85.5%
3-2	78.8%	74.3%	62.8%	79.4%
3-3	66.9%	84.8%	92.8%	76.2%
3-4	75.2%	62.4%	72.2%	97.5%
3-5	83.3%	75.5%	73.6%	77.9%
4-0	92.4%	78.8%	81.0%	85.9%
5-1	62.7%	88.7%	89.4%	96.3%
5-2	80.4%	78.5%	97.7%	89.1%
6-0	73.2%	82.5%	98.9%	85.1%
7-0	81.5%	93.6%	84.7%	87.6%
8-1	87.2%	89.5%	91.3%	92.5%
8-2	93.5%	85.7%	90.8%	90.2%
9-1	90.0%	82.1%	84.6%	89.2%
9-2	93.9%	95.1%	91.7%	91.7%
9-3	79.0%	85.7%	81.7%	87.7%
10-0	81.0%	86.0%	87.7%	79.9%
State	**83.0%**	**83.2%**	**82.9%**	**86.7%**

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

Table 16 reports Varicella coverage rates among the 19 health districts and statewide for 1999-00. 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 45.2 percent to 81.7 percent, with a statewide coverage rate of 64.3 percent for the Varicella vaccine. This is an increase from the 1998-99 Varicella rate of 47.1 percent.

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

District	1996-97 Rates 1 Varicella*	1997-98 Rates 1 Varicella	1998-99 Rates 1 Varicella	1999-00 Rates 1 Varicella
1-1	NA	5.2%	41.5%	45.2%
1-2	NA	14.2%	48.0%	58.2%
2-0	NA	21.1%	48.4%	81.7%
3-1	NA	50.2%	43.2%	66.3%
3-2	NA	17.3%	43.1%	67.5%
3-3	NA	71.5%	80.6%	52.4%
3-4	NA	9.9%	54.2%	89.5%
3-5	NA	29.4%	51.0%	57.2%
4-0	NA	6.7%	31.7%	65.6%
5-1	NA	12.3%	21.2%	61.3%
5-2	NA	15.4%	63.7%	61.8%
6-0	NA	19.0%	75.3%	61.7%
7-0	NA	21.4%	24.1%	53.5%
8-1	NA	16.3%	30.4%	61.7%
8-2	NA	18.6%	71.8%	66.0%
9-1	NA	14.3%	18.9%	51.5%
9-2	NA	3.7%	27.3%	58.6%
9-3	NA	5.0%	25.7%	57.5%
10-0	NA	11.6%	52.0%	58.4%
State	NA	**19.0%**	**47.1%**	**64.3%**

Notes: Varicella Rates not calculated for 1996-97. State rates based on data weighted by health district.

Summary of Statewide Analyses

The statewide analyses reviewed both the study's process of measuring immunization rates and the rates themselves. In measuring immunization rates, the study assessed rates at three levels: 4:3:1+3 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 increased in 1999-00 statewide and in 12 health districts, compared to the same rates as measured by this study in 1998-99. The 1999-00 statewide rates denoting 4:3:1 coverage rates by individual vaccine increased when compared to the 1998-99 rates.

SECTION IV:

RESULTS OF DISTRICT LEVEL ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

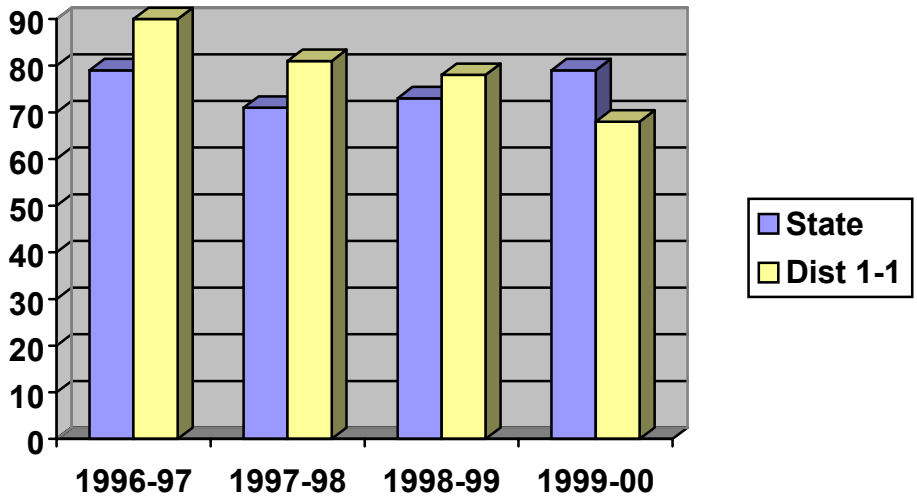
The immunization rates for this fourth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 2: Response Rates for the 1999-00 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 9-14. 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 crosstabulation 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 192 children born in November 1997. From the 192 children, 170 records were located. [Response Rate=88.5%]

- **The 4:3:1 immunization coverage estimate is 67.5 percent (112/166*).** This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 38.6 percent (64/166).** This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 17:
District Immunization Rates at 2 Years of Age for Health District 1-1 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	90.2%	83.0%	78.2%	67.5%
3 OPV/IPV	96.0%	88.1%	90.8%	82.2%
1 MMR	95.4%	90.4%	86.6%	73.5%
3 Hib	92.5%	88.9%	90.8%	76.5%
3 HepB	94.8%	92.6%	88.0%	76.5%
1 Varicella*	---	5.2%	41.5%	45.2%

***Varicella rates include shots given beyond the 2nd birthday

Table 17 reveals the coverage rates of each vaccine series by the second birthday. With the exception of the Varicella vaccine, coverage rates ranged from 67.5 to 82.2 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 18 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 18:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	134	80.7%
DTP2/DTaP2	131	78.9%
DTP3/DTaP3	123	74.1%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	134	80.7%
OPV/IPV2	130	78.3%
OPV/IPV3	22	13.3%
OPV/IPV4	0	0.0%
MMR1	10	6.0%
MMR2	0	0.0%
HIB1	133	80.1%
HIB2	130	78.3%
HIB3	123	74.1%
HIB4	2	1.2%
HIB5	0	0.0%
HEPB1	134	80.7%
HEPB2	132	79.5%
HEPB3	121	72.9%
HEPB4	1	0.6%
VAR1	4	2.4%
VAR2	0	0.0%

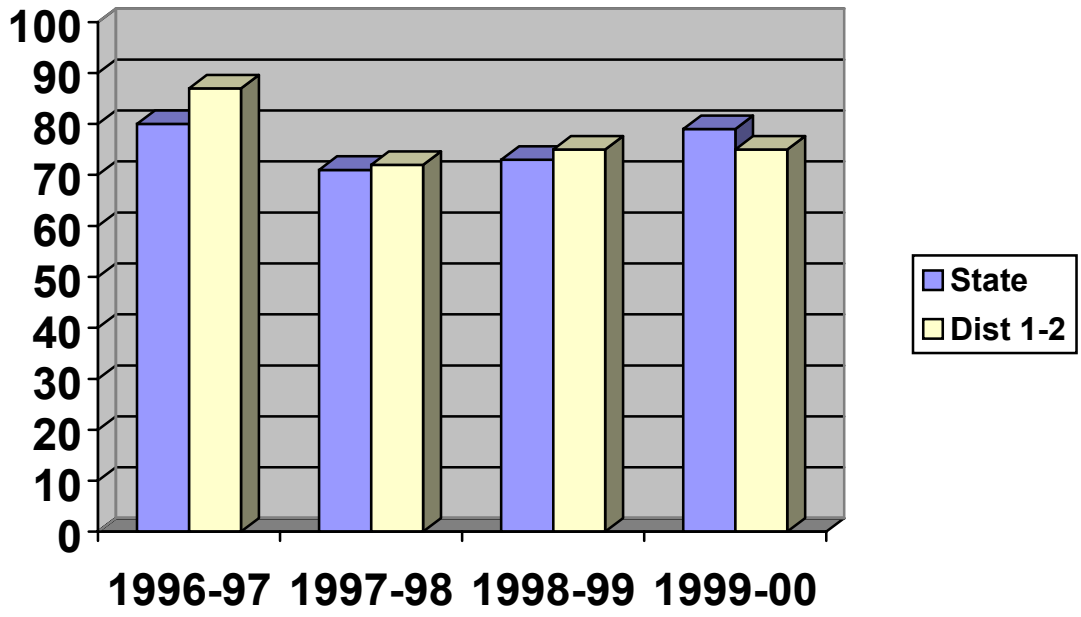
*Percent = number immunized / sample size
sample size = 166

Individual Health District Report: District 1-2

The eligible sample from this district included 186 children born in November 1997. From these children, 150 records were located (80.6%).

- **4:3:1 immunization coverage estimate is 75.3 percent (110/146*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **4:3:1+3 immunization coverage estimate 46.6 percent (68/146)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 19:
District Immunization Rates at 2 years of Age for Health District 1-2 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	85.9%	72.6%	75.4%	77.4%
3 OPV/IPV	93.7%	88.5%	86.9%	82.2%
1 MMR	91.5%	85.8%	84.6%	83.6%
3 Hib	80.3%	89.4%	88.0%	86.3%
3 HepB	86.6%	85.8%	86.3%	86.3%
1 Varicella*	---	14.2%	48.0%	58.2%

*Varicella rates include shots given beyond the 2nd birthday

Table 19 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 77.4 to 86.3 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 20 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 20:
1999-00 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 1-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	133	91.1%
DTP2/DTaP2	130	89.0%
DTP3/DTaP3	121	82.9%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	132	90.4%
OPV/IPV2	129	88.4%
OPV/IPV3	19	13.0%
OPV/IPV4	0	0.0%
MMR1	2	1.4%
MMR2	0	0.0%
HIB1	132	90.4%
HIB2	129	88.4%
HIB3	115	78.8%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	135	92.5%
HEPB2	132	90.4%
HEPB3	102	69.9%
HEPB4	1	0.7%
VAR1	5	3.4%
VAR2	0	0.0%

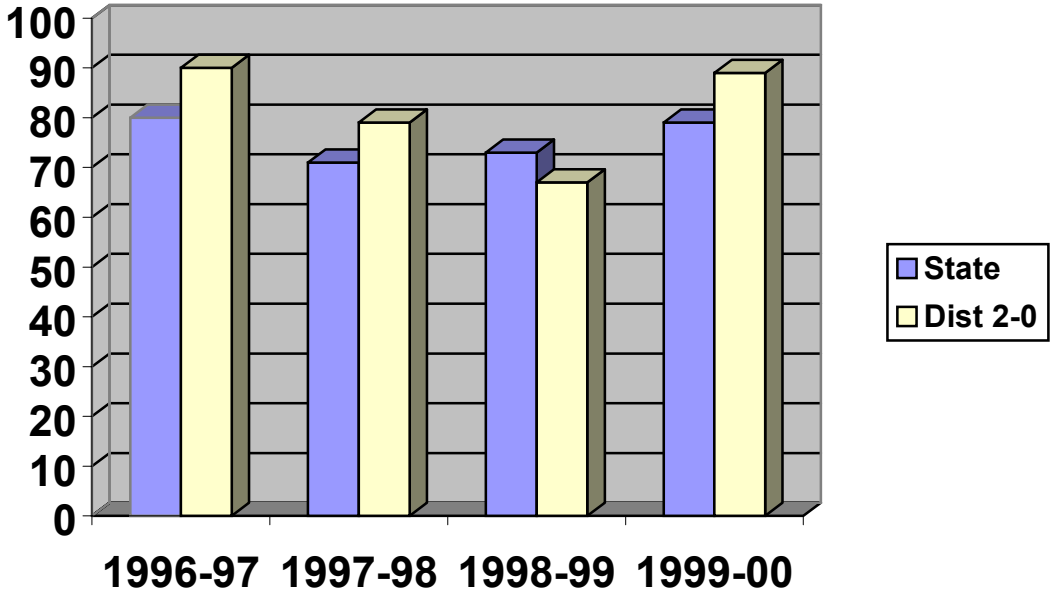
*Percent = number immunized / sample size
Sample size = 146

Individual Health District Report: District 2-0

The eligible sample from this district included 230 children born in November 1997. From the 230 children, 140 records were located (Response rate = 60.9%).

- **4:3:1 immunization coverage estimate is 88.5 percent (116/131*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **4:3:1+3 immunization coverage estimate is 77.1 percent (101/131)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 21:
District Immunization Rates at 2 Years of Age for Health District 2-0 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	91.2%	80.3%	67.7%	89.3%
3 OPV/IPV	96.7%	93.4%	73.7%	88.5%
1 MMR	93.4%	85.5%	72.0%	90.1%
3 Hib	96.7%	88.2%	73.1%	88.5%
3 HepB	92.8%	88.2%	73.1%	89.3%
1 Varicella*	---	21.1%	48.4%	81.7%

*Varicella rates include shots given beyond the 2nd birthday

Table 21 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 88.5 to 90.1 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 22 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 22:
1999-00 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 2-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	120	90.1%
DTP2/DTaP2	118	90.1%
DTP3/DTaP3	113	86.3%
DTP4/DTaP4	1	0.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	120	91.6%
OPV/IPV2	118	90.1%
OPV/IPV3	28	21.4%
OPV/IPV4	0	0.0%
MMR1	5	3.8%
MMR2	0	0.0%
HIB1	120	91.6%
HIB2	117	89.3%
HIB3	109	83.2%
HIB4	3	2.3%
HIB5	0	0.0%
HEPB1	122	93.1%
HEPB2	118	90.1%
HEPB3	104	79.4%
HEPB4	0	0.0%
VAR1	8	6.1%
VAR2	0	0.0%

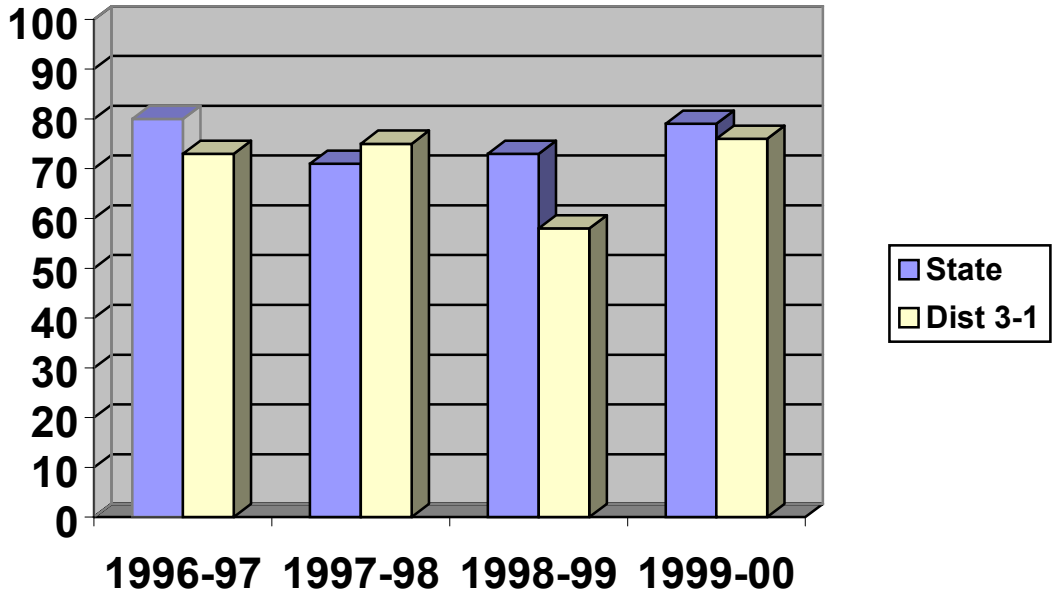
*Percent = number immunized / sample size
Sample size = 131

Individual Health District Report: District 3-1

The eligible sample from this district included 360 children born in November 1997. From the 360 children, 197 records were located.

- **The 4:3:1 immunization coverage estimate is 75.6 percent (146/193*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 57.5 percent (111/193)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 23:
District Immunization Rates at 2 Years of Age for Health District 3-1 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	73.4%	77.9%	59.0%	77.7%
3 OPV/IPV	84.7%	84.4%	72.5%	79.3%
1 MMR	77.8%	78.4%	64.0%	81.9%
3 Hib	75.4%	83.5%	71.6%	85.0%
3 HepB	74.4%	82.3%	72.1%	85.5%
1 Varicella*	---	50.2%	43.2%	66.3%

*Varicella rates include shots given beyond the 2nd birthday

Table 23 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 77.7 to 85.5 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 24 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 24:
1999-00 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	177	91.7%
DTP2/DTaP2	168	87.0%
DTP3/DTaP3	161	83.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	177	91.7%
OPV/IPV2	168	87.0%
OPV/IPV3	33	17.1%
OPV/IPV4	1	0.5%
MMR1	12	6.2%
MMR2	0	0.0%
HIB1	175	90.7%
HIB2	167	86.5%
HIB3	155	80.3%
HIB4	7	3.6%
HIB5	0	0.0%
HEPB1	185	95.9%
HEPB2	176	91.2%
HEPB3	152	78.8%
HEPB4	1	0.5%
VAR1	11	5.7%
VAR2	0	0.0%

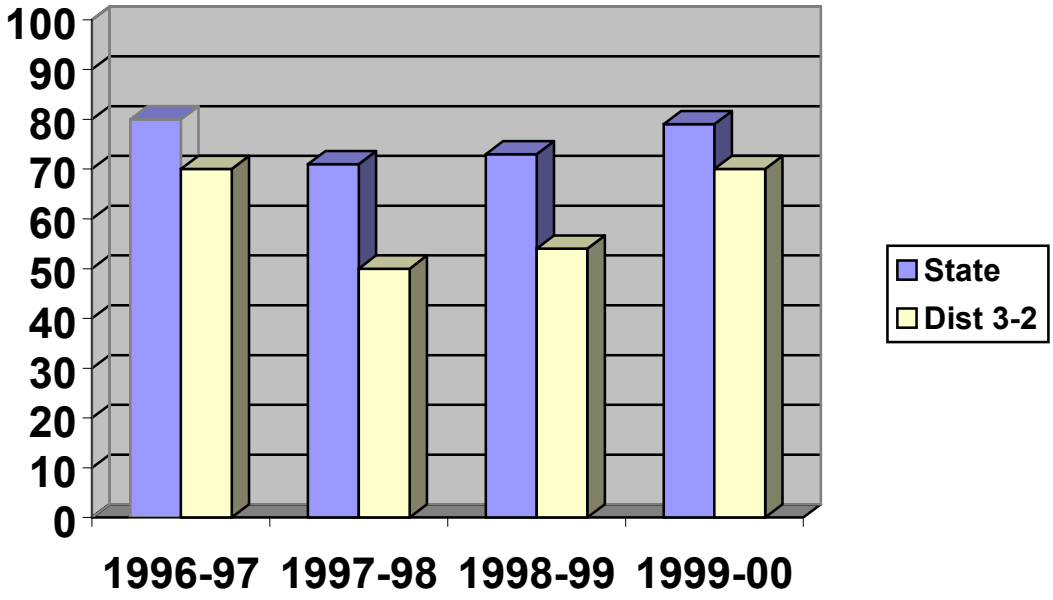
*Percent = number immunized / sample size
Sample size = 193

Individual Health District Report: District 3-2

The eligible sample from this district included 480 children born in November 1997. From the 480 children, 224 records were located. [Response Rate=46.7%]

- **The 4:3:1 immunization coverage estimate is 69.6 percent (135/194*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 54.6 percent (106/194)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 25:
District Immunization Rates at 2 Years of Age for Health District 3-2 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	72.1%	51.8%	55.1%	71.1%
3 OPV/IPV	83.8%	75.4%	64.9%	76.8%
1 MMR	80.4%	71.2%	65.8%	77.8%
3 Hib	76.3%	69.1%	65.2%	79.9%
3 HepB	78.8%	74.3%	62.8%	79.4%
1 Varicella*	---	17.3%	43.1%	67.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 25 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 71.1 to 79.9 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 26 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 26:
1999-00 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	170	87.6%
DTP2/DTaP2	163	84.0%
DTP3/DTaP3	146	75.3%
DTP4/DTaP4	3	1.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	170	87.6%
OPV/IPV2	160	82.5%
OPV/IPV3	49	25.3%
OPV/IPV4	1	0.5%
MMR1	10	5.2%
MMR2	0	0.0%
HIB1	167	86.1%
HIB2	160	82.5%
HIB3	139	71.6%
HIB4	3	1.5%
HIB5	0	0.0%
HEPB1	173	89.2%
HEPB2	166	85.6%
HEPB3	132	68.0%
HEPB4	0	0.0%
VAR1	11	5.7%
VAR2	0	0.0%

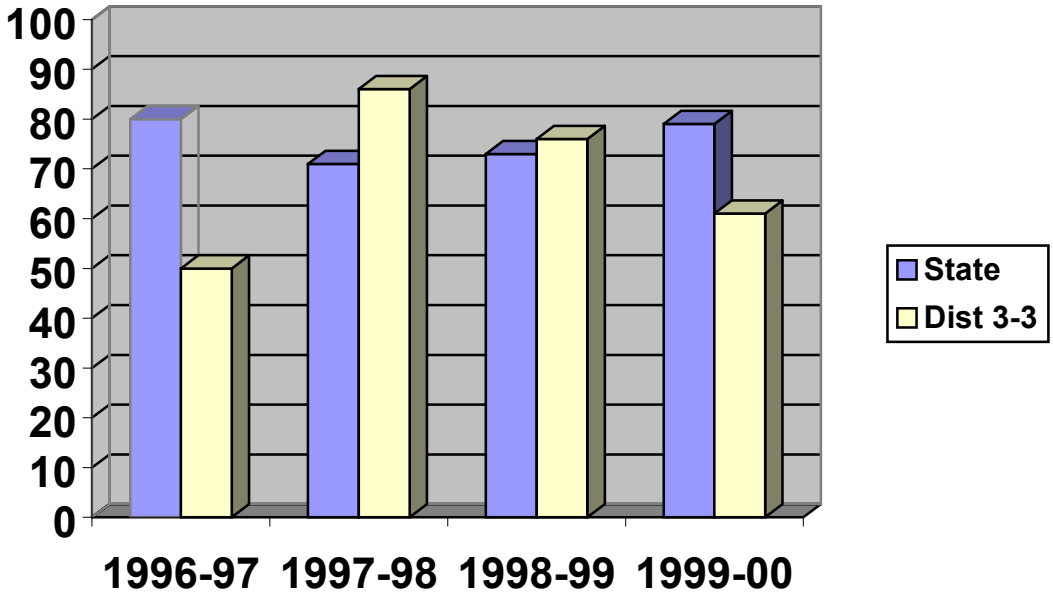
*Percent = number immunized / sample size
Sample size = 194

Individual Health District Report: District 3-3

The eligible sample from this district included 177 children born in November 1997. From the 177 children, 91 records were located. [Response Rate=51.4%]

- **The 4:3:1 immunization coverage estimate is 60.7 percent (51/84*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 40.5 percent (34/84)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 27:
District Immunization Rates at 2 Years of Age for Health District 3-3 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	69.6%	86.1%	76.3%	63.1%
3 OPV/IPV	75.0%	88.5%	93.5%	71.4%
1 MMR	54.1%	88.5%	84.9%	70.2%
3 Hib	64.9%	87.9%	93.5%	79.8%
3 HepB	66.9%	84.8%	92.8%	76.2%
1 Varicella*	---	71.5%	80.6%	52.4%

*Varicella rates include shots given beyond the 2nd birthday

Table 27 reveals the coverage rates of each vaccine series by the second birthday. Coverage rates ranged from 63.1 to 79.8 percent. For more information on Varicella rates, see Appendix D.

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:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	73	86.9%
DTP2/DTaP2	71	84.5%
DTP3/DTaP3	63	75.0%
DTP4/DTaP4	4	4.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	74	88.1%
OPV/IPV2	72	85.7%
OPV/IPV3	22	26.2%
OPV/IPV4	1	1.2%
MMR1	7	8.3%
MMR2	0	0.0%
HIB1	71	84.5%
HIB2	68	81.0%
HIB3	55	65.5%
HIB4	6	7.1%
HIB5	0	0.0%
HEPB1	75	89.3%
HEPB2	69	82.1%
HEPB3	55	65.5%
HEPB4	0	0.0%
VAR1	6	7.1%
VAR2	0	0.0%

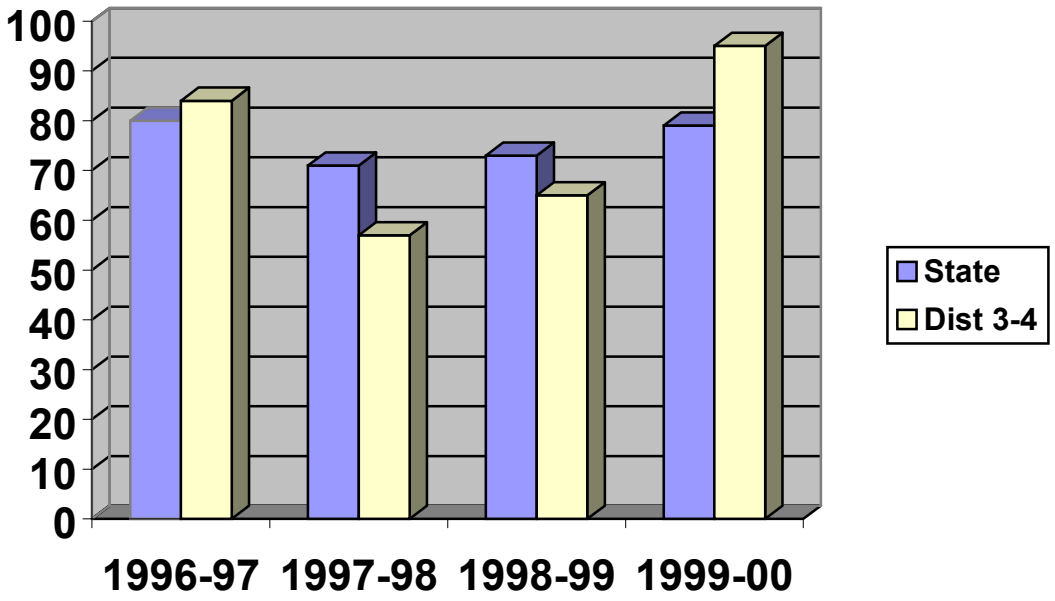
*Percent = number immunized / sample size
Sample size = 84

Individual Health District Report: District 3-4

The eligible sample from this district included 482 children born in November 1997. From the 482 children, 386 records were located. [Response Rate=80.1%]

- **The 4:3:1 immunization coverage estimate is 94.5 percent (343/363*)**. This rate is not only higher than the statewide 4:3:1 immunization rate of 78.8 percent, it is the highest 4:3:1 district immunization coverage estimate reported.

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



- **The 4:3:1+3 immunization coverage estimate is 85.1 percent (309/363)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 29:
District Immunization Rates at 2 Years of Age for Health District 3-4 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	84.7%	59.4%	66.4%	94.8%
3 OPV/IPV	91.7%	64.4%	72.9%	96.4%
1 MMR	87.9%	63.4%	69.7%	96.4%
3 Hib	80.9%	59.4%	70.4%	97.5%
3 HepB	75.2%	62.4%	72.2%	97.5%
1 Varicella*	---	9.9%	54.2%	89.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 29 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 94.8 to 97.5 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 30 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 30:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-4

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	361	99.4%
DTP2/DTaP2	356	98.1%
DTP3/DTaP3	346	95.3%
DTP4/DTaP4	1	0.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	361	99.4%
OPV/IPV2	355	97.8%
OPV/IPV3	88	24.2%
OPV/IPV4	0	0.0%
MMR1	24	6.6%
MMR2	0	0.0%
HIB1	362	99.7%
HIB2	355	97.8%
HIB3	335	92.3%
HIB4	20	5.5%
HIB5	0	0.0%
HEPB1	361	99.4%
HEPB2	358	98.6%
HEPB3	270	74.4%
HEPB4	2	0.6%
VAR1	38	10.5%
VAR2	0	0.0%

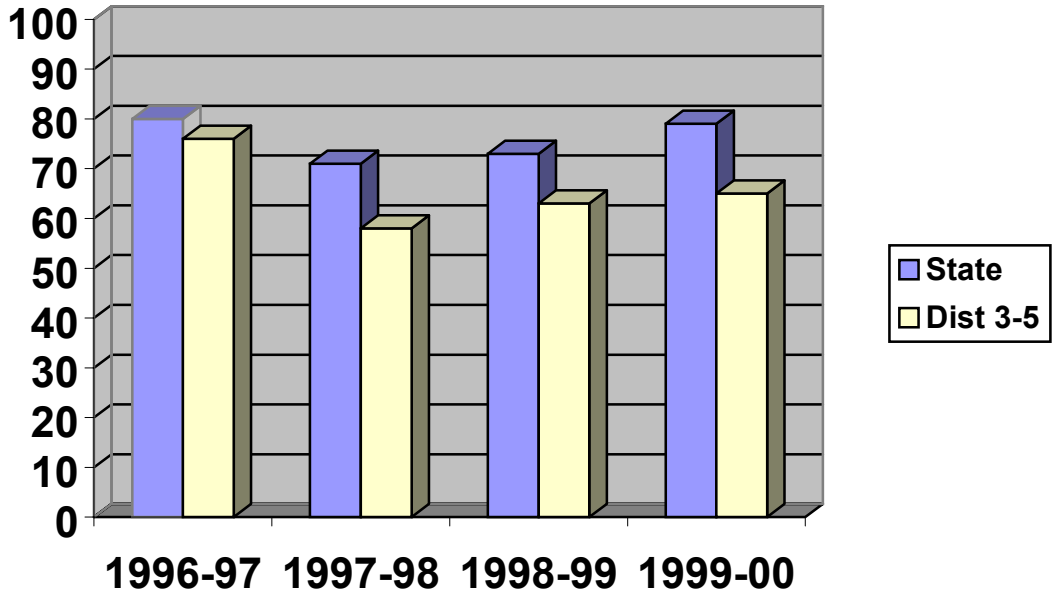
*Percent = number immunized / sample size
Sample size = 363

Individual Health District Report: District 3-5

The eligible sample from this district included 370 children born in November 1997. From the 370 children, 244 records were located. [Response Rate=65.9%]

- **The 4:3:1 immunization coverage estimate is 64.9 percent (144/222*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 51.4 percent (114/222)**. This rate is slightly lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 31:
District Immunization Rates at 2 Years of Age for Health District 3-5 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	79.2%	61.3%	64.4%	66.2%
3 OPV/IPV	89.6%	77.9%	76.4%	75.7%
1 MMR	84.6%	68.1%	73.3%	71.6%
3 Hib	84.6%	74.8%	76.7%	77.0%
3 HepB	83.3%	75.5%	73.6%	77.9%
1 Varicella*	---	29.4%	51.0%	57.2%

*Varicella rates include shots given beyond the 2nd birthday

Table 31 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 66.2 to 77.9 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 32 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 32:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-5

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	208	93.7%
DTP2/DTaP2	192	86.5%
DTP3DTaP3	164	73.9%
DTP4/DTaP4	3	1.4%
DTP5/DTaP5	0	0.0%
OPV/IPV1	208	93.7%
OPV/IPV2	188	84.7%
OPV/IPV3	72	32.4%
OPV/IPV4	1	0.5%
MMR1	7	3.2%
MMR2	0	0.0%
HIB1	205	92.3%
HIB2	189	85.1%
HIB3	153	68.9%
HIB4	3	1.4%
HIB5	0	0.0%
HEPB1	206	92.8%
HEPB2	185	83.3%
HEPB3	152	68.5%
HEPB4	2	0.9%
VAR1	16	7.2%
VAR2	0	0.0%

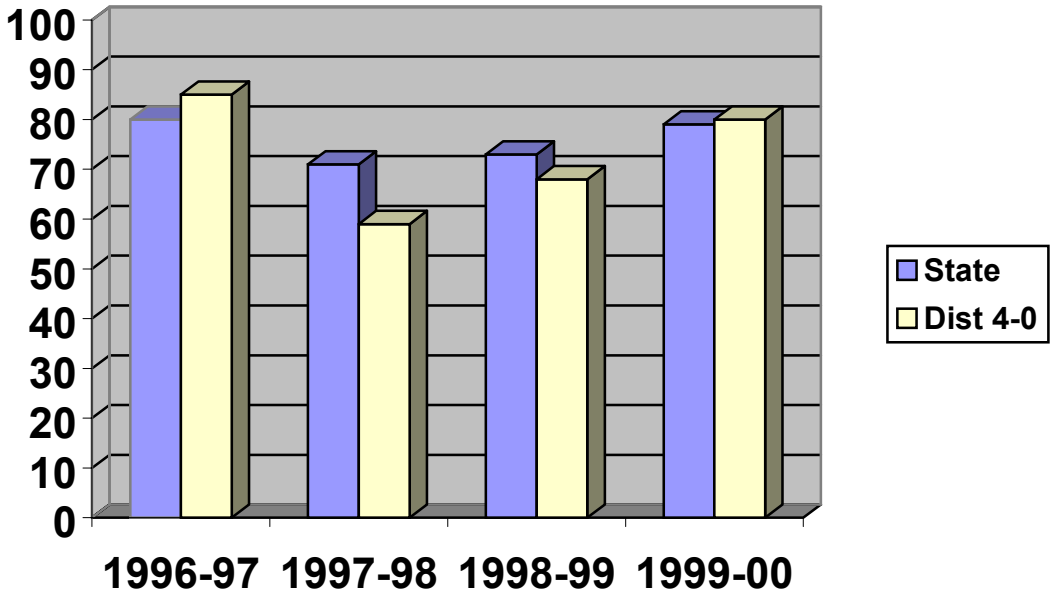
*Percent = number immunized / sample size
Sample size = 222

Individual Health District Report: District 4-0

The eligible sample from this district included 300 children born in November 1997. From the 300 children, 201 records were located. [Response Rate=67.0%]

- **The 4:3:1 immunization coverage estimate is 79.7 percent (153/192*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 57.8 percent (111/192)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 33:
District Immunization Rates at 2 Years of Age for Health District 4-0 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	86.1%	61.5%	69.0%	79.7%
3 OPV/IPV	93.0%	83.7%	80.2%	85.9%
1 MMR	91.1%	69.2%	73.1%	84.9%
3 Hib	91.1%	79.8%	81.0%	88.5%
3 HepB	92.4%	78.8%	81.0%	85.9%
1 Varicella*	---	6.7%	31.7%	65.6%

*Varicella rates include shots given beyond the 2nd birthday

Table 33 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 79.7 to 88.5 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 34 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 34:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	181	94.3%
DTP2/DTaP2	174	90.6%
DTP3/DTaP3	161	83.9%
DTP4/DTaP4	2	1.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	181	94.3%
OPV/IPV2	173	90.1%
OPV/IPV3	82	42.7%
OPV/IPV4	1	0.5%
MMR1	8	4.2%
MMR2	0	0.0%
HIB1	181	94.3%
HIB2	171	89.1%
HIB3	150	78.1%
HIB4	2	1.0%
HIB5	0	0.0%
HEPB1	183	95.3%
HEPB2	175	91.1%
HEPB3	149	77.6%
HEPB4	1	0.5%
VAR1	9	4.7%
VAR2	0	0.0%

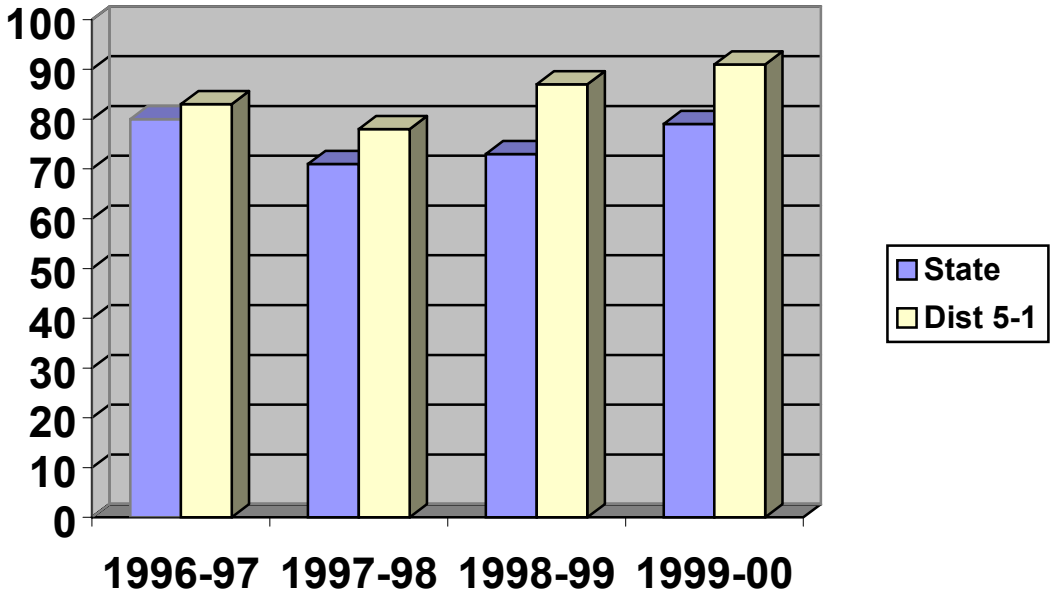
*Percent = number immunized / sample size
Sample size = 192

Individual Health District Report: District 5-1

The eligible sample from this district included 83 children born in November 1997. From the 83 children, 83 records were located. [Response Rate=100.0%].

- **The 4:3:1 immunization coverage estimate is 91.3 percent (73/80*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate 57.5 percent (46/80)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 35:
District Immunization Rates at 2 Years of Age for Health District 5-1 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	84.0%	79.2%	87.1%	91.3%
3 OPV/IPV	89.3%	90.6%	92.9%	93.8%
1 MMR	88.0%	84.0%	91.8%	96.3%
3 Hib	84.0%	89.6%	94.1%	96.3%
3 HepB	62.7%	88.7%	89.4%	96.3%
1 Varicella*	---	12.3%	21.2%	61.3%

***Varicella rates include shots given beyond the 2nd birthday

Table 35 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 91.3 to 96.3 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 36 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 36:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	78	97.5%
DTP2/DTaP2	76	95.0%
DTP3/DTaP3	68	85.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	78	97.5%
OPV/IPV2	75	93.8%
OPV/IPV3	14	17.5%
OPV/IPV4	0	0.0%
MMR1	0	0.0%
MMR2	0	0.0%
HIB1	78	97.5%
HIB2	76	95.0%
HIB3	67	83.8%
HIB4	1	1.3%
HIB5	0	0.0%
HEPB1	80	100.0%
HEPB2	77	96.3%
HEPB3	71	88.8%
HEPB4	0	0.0%
VAR1	4	5.0%
VAR2	0	0.0%

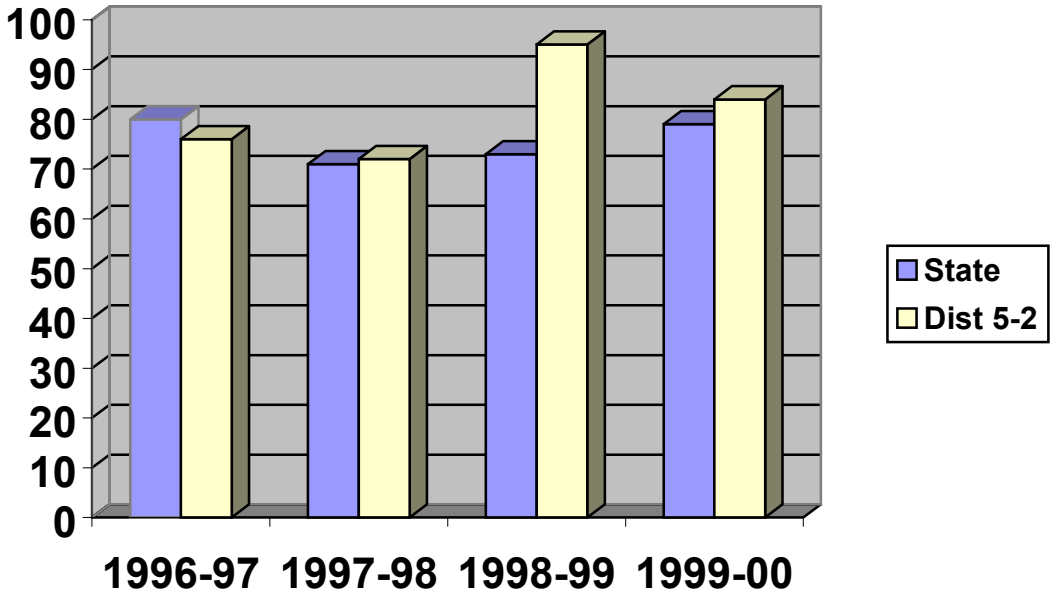
*Percent = number immunized / sample size
Sample size = 80

Individual Health District Report: District 5-2

The eligible sample from this district included 71 children born in November 1997. From the 71 children, 55 records were located. [Response Rate=77.5%].

- **The 4:3:1 immunization coverage estimate is 83.6 percent (46/55)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 56.4 percent (31/55)**. This rate is almost equal to than the statewide 4:3:1+3 immunization rate of 56.3 percent.

Table 37:
District Immunization Rates at 2 Years of Age for Health District 5-2 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	77.4%	72.5%	96.5%	83.6%
3 OPV/IPV	86.9%	85.9%	98.0%	87.3%
1 MMR	81.4%	80.5%	95.7%	90.9%
3 Hib	85.4%	81.2%	98.0%	96.4%
3 HepB	80.4%	78.5%	97.7%	89.1%
1 Varicella*	---	15.4%	63.7%	61.8%

*Varicella rates include shots given beyond the 2nd birthday

Table 37 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 83.6 to 96.4 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

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. 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:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	54	98.2%
DTP2/DTaP2	54	98.2%
DTP3/DTaP3	50	90.9%
DTP4/DTaP4	1	1.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	54	98.2%
OPV/IPV2	54	98.2%
OPV/IPV3	12	21.8%
OPV/IPV4	0	0.0%
MMR1	5	9.1%
MMR2	1	1.8%
HIB1	54	98.2%
HIB2	54	98.2%
HIB3	47	85.5%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	53	96.4%
HEPB2	53	96.4%
HEPB3	48	87.3%
HEPB4	1	1.8%
VAR1	5	9.1%
VAR2	0	0.0%

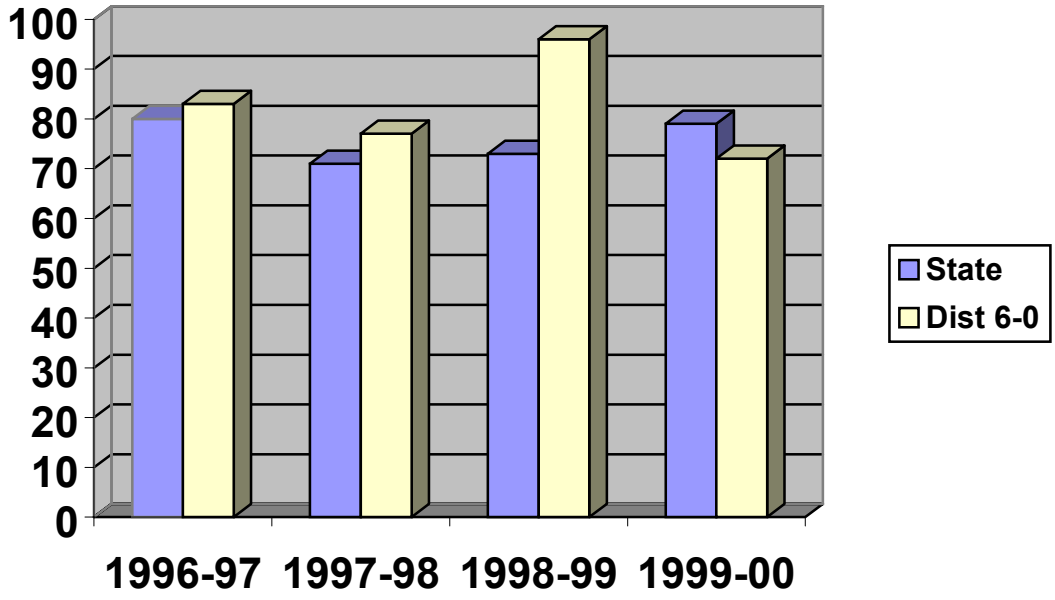
*Percent = number immunized / sample size
Sample size = 55

Individual Health District Report: District 6-0

The eligible sample from this district included 53 children born in November 1997. From the 53 children, 48 records were located. [Response Rate=90.6%]

- **The 4:3:1 immunization coverage estimate is 72.3 percent (34/47*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 53.2 percent (25/47)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 39:
District Immunization Rates at 2 Years of Age for Health District 6-0 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	83.9%	76.6%	96.1%	74.5%
3 OPV/IPV	91.3%	91.2%	98.3%	85.1%
1 MMR	84.6%	84.7%	98.3%	87.2%
3 Hib	87.2%	92.0%	98.3%	87.2%
3 HepB	73.2%	82.5%	98.9%	85.1%
1 Varicella*	---	19.0%	75.3%	61.7%

*Varicella rates include shots given beyond the 2nd birthday

Table 39 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 74.5 to 87.2 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 40 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 40:
1999-00 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 6-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	44	93.6%
DTP2/DTaP2	42	89.4%
DTP3/DTaP3	38	80.9%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	44	93.6%
OPV/IPV2	42	89.4%
OPV/IPV3	16	34.0%
OPV/IPV4	0	0.0%
MMR1	1	2.1%
MMR2	0	0.0%
HIB1	44	93.6%
HIB2	42	89.4%
HIB3	37	78.7%
HIB4	1	2.1%
HIB5	0	0.0%
HEPB1	46	97.9%
HEPB2	45	95.7%
HEPB3	35	74.5%
HEPB4	1	2.1%
VAR1	3	6.4%
VAR2	0	0.0%

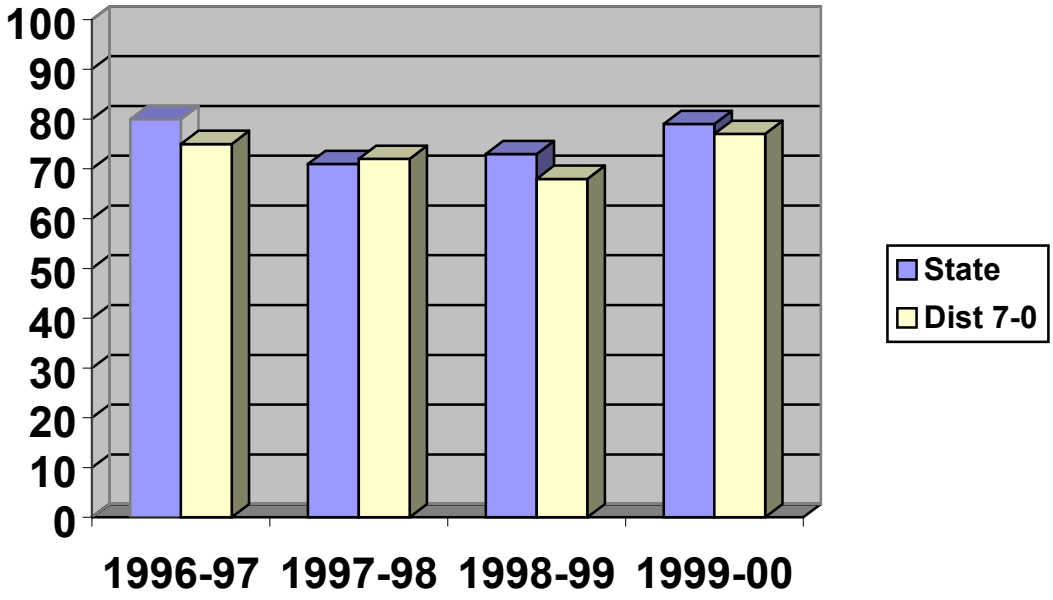
*Percent = number immunized / sample size
Sample size = 47

Individual Health District Report: District 7-0

The eligible sample from this district included 247 children born in November 1997. From the 247 children, 174 records were located. [Response Rate=70.4%]

- **The 4:3:1 immunization coverage estimate is 77.1 percent (131/170*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 46.5 percent (79/170)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 41:
District Immunization Rates at 2 Years of Age for Health District 7-0 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	78.2%	73.1%	69.3%	77.1%
3 OPV/IPV	88.2%	93.2%	83.2%	85.9%
1 MMR	83.2%	92.3%	83.2%	85.3%
3 Hib	72.3%	88.5%	85.4%	85.3%
3 HepB	81.5%	93.6%	84.7%	87.6%
1 Varicella*	---	21.4%	24.1%	53.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 41 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 77.1 to 87.6 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 42 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 42:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 7-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	152	89.4%
DTP2/DTaP2	146	85.9%
DTP3/DTaP3	133	78.2%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	152	89.4%
OPV/IPV2	146	85.9%
OPV/IPV3	48	28.2%
OPV/IPV4	0	0.0%
MMR1	4	2.4%
MMR2	0	0.0%
HIB1	148	87.1%
HIB2	141	82.9%
HIB3	126	74.1%
HIB4	1	0.6%
HIB5	0	0.0%
HEPB1	152	89.4%
HEPB2	149	87.6%
HEPB3	129	75.9%
HEPB4	0	0.0%
VAR1	2	1.2%
VAR2	0	0.0%

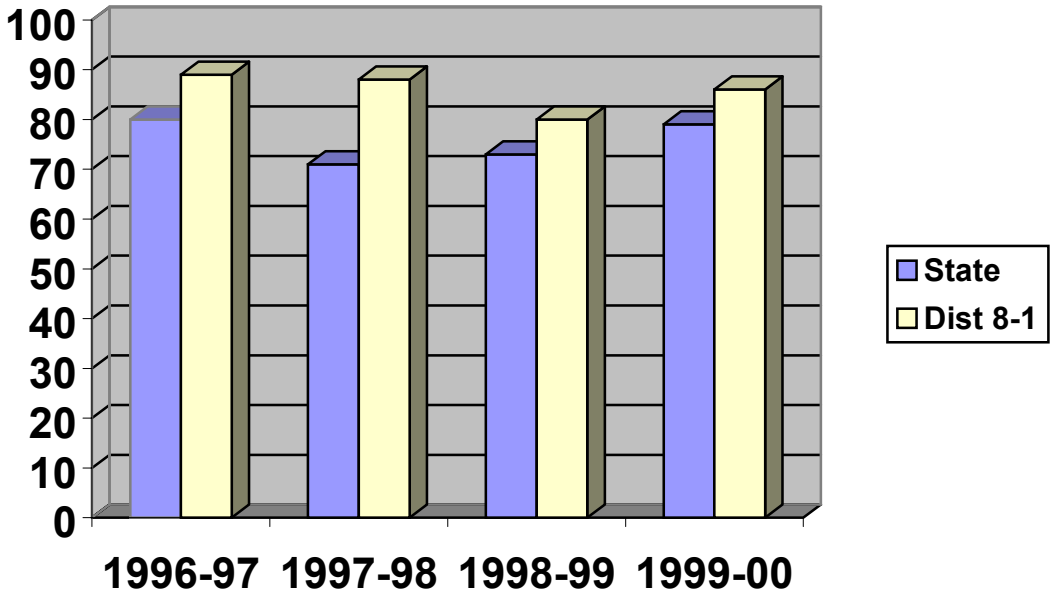
*Percent = number immunized / sample size
Sample size = 170

Individual Health District Report: District 8-1

The eligible sample from this district included 116 children born in November 1997. From the 116 children, 111 records were located. [Response Rate=95.7%]

- **The 4:3:1 immunization coverage estimate is 86.0 percent (92/107*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 53.3 percent (57/107)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 43:
District Immunization Rates at 2 Years of Age for Health District 8-1 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	90.4%	88.4%	81.5%	86.9%
3 OPV/IPV	97.6%	94.2%	94.6%	87.9%
1 MMR	91.2%	95.3%	89.1%	90.7%
3 Hib	96.8%	96.5%	94.6%	92.5%
3 HepB	87.2%	89.5%	91.3%	92.5%
1 Varicella*	---	16.3%	30.4%	61.7%

*Varicella rates include shots given beyond the 2nd birthday

Table 43 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 86.9 to 92.5 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 44 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 44:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-1 by Study Year

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	104	97.2%
DTP2/DTaP2	101	94.4%
DTP3/DTaP3	98	91.6%
DTP4/DTaP4	1	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	103	96.3%
OPV/IPV2	101	94.4%
OPV/IPV3	42	39.3%
OPV/IPV4	0	0.0%
MMR1	1	0.9%
MMR2	0	0.0%
HIB1	102	95.3%
HIB2	100	93.5%
HIB3	94	87.9%
HIB4	2	1.9%
HIB5	0	0.0%
HEPB1	106	99.1%
HEPB2	104	97.2%
HEPB3	77	72.0%
HEPB4	3	2.8%
VAR1	9	8.4%
VAR2	0	0.0%

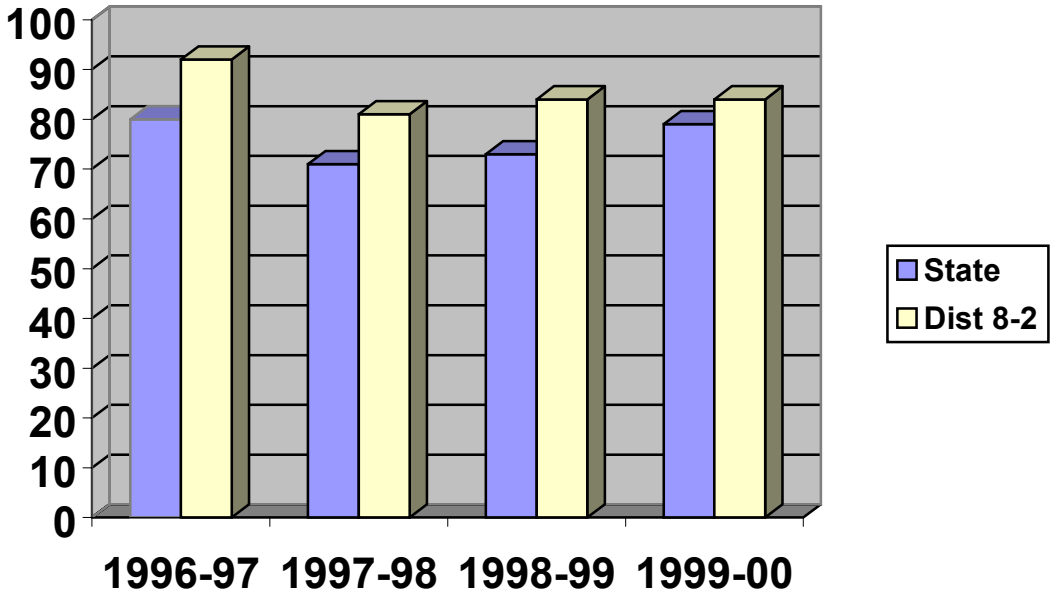
*Percent = number immunized / sample size
Sample size = 107

Individual Health District Report: District 8-2

The eligible sample from this district included 179 children born in November 1997. From the 179 children, 160 records were located. [Response Rate=89.4%]

- **The 4:3:1 immunization coverage estimate is 83.7 percent (128/153*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate rate is 55.6 percent (85/153)**. This rate is slightly lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 45:
District Immunization Rates at 2 Years of Age for Health District 8-2 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	94.6%	81.4%	84.5%	85.6%
3 OPV/IPV	97.3%	88.6%	90.1%	90.8%
1 MMR	94.6%	85.7%	91.5%	88.9%
3 Hib	85.5%	87.1%	90.8%	92.8%
3 HepB	93.5%	85.7%	90.8%	90.2%
1 Varicella*	---	18.6%	71.8%	66.0%

*Varicella rates include shots given beyond the 2nd birthday

Table 45 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 85.6 to 92.8 percent for the 1999-00 study data. Varicella coverage increased dramatically since the 1997-98 study for the 1998-99 study data, but rates went down for the 1999-00 study. For more information on Varicella rates, see Appendix D.

Table 46 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 46:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	148	96.7%
DTP2/DTaP2	140	91.5%
DTP3/DTaP3	133	86.9%
DTP4/DTaP4	2	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	147	96.1%
OPV/IPV2	140	91.5%
OPV/IPV3	45	29.4%
OPV/IPV4	1	0.7%
MMR1	5	3.3%
MMR2	0	0.0%
HIB1	146	95.4%
HIB2	139	90.8%
HIB3	130	85.0%
HIB4	4	2.6%
HIB5	0	0.0%
HEPB1	150	98.0%
HEPB2	144	94.1%
HEPB3	114	74.5%
HEPB4	0	0.0%
VAR1	4	2.6%
VAR2	0	0.0%

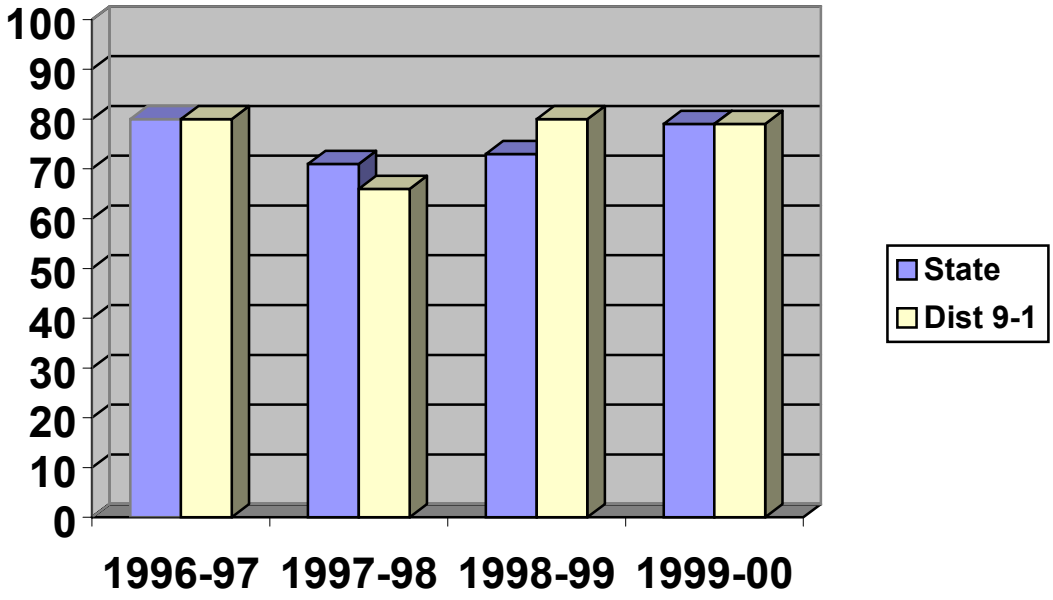
*Percent = number immunized / sample size
Sample size = 153

Individual Health District Report: District 9-1

The eligible sample from this district included 134 children born in November 1997. From the 134 children, 132 records were located. [Response Rate=98.5%]

- **The 4:3:1 immunization coverage estimate is 78.5 percent (102/130*)**. This rate is equal to the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 39.2 percent (51/130)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 47:
District Immunization Rates at 2 Years of Age for Health District 9-1 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	79.3%	67.1%	80.4%	80.8%
3 OPV/IPV	93.3%	80.7%	87.4%	88.5%
1 MMR	90.7%	72.1%	86.7%	85.4%
3 Hib	93.3%	81.4%	86.0%	91.5%
3 HepB	90.0%	82.1%	84.6%	89.2%
1 Varicella*	---	14.3%	18.8%	51.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 47 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 80.8 to 91.5 percent for the 1999-00 study data. Little increase in Varicella coverage was seen. For more information on Varicella rates, see Appendix D.

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:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	125	96.2%
DTP2/DTaP2	122	93.8%
DTP3/DTaP3	115	88.5%
DTP4/DTaP4	2	1.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	125	96.2%
OPV/IPV2	122	93.8%
OPV/IPV3	66	50.8%
OPV/IPV4	0	0.0%
MMR1	6	4.6%
MMR2	0	0.0%
HIB1	125	96.2%
HIB2	121	93.1%
HIB3	112	86.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	127	9772%
HEPB2	123	94.6%
HEPB3	104	80.0%
HEPB4	0	0.0%
VAR1	4	3.1%
VAR2	0	0.0%

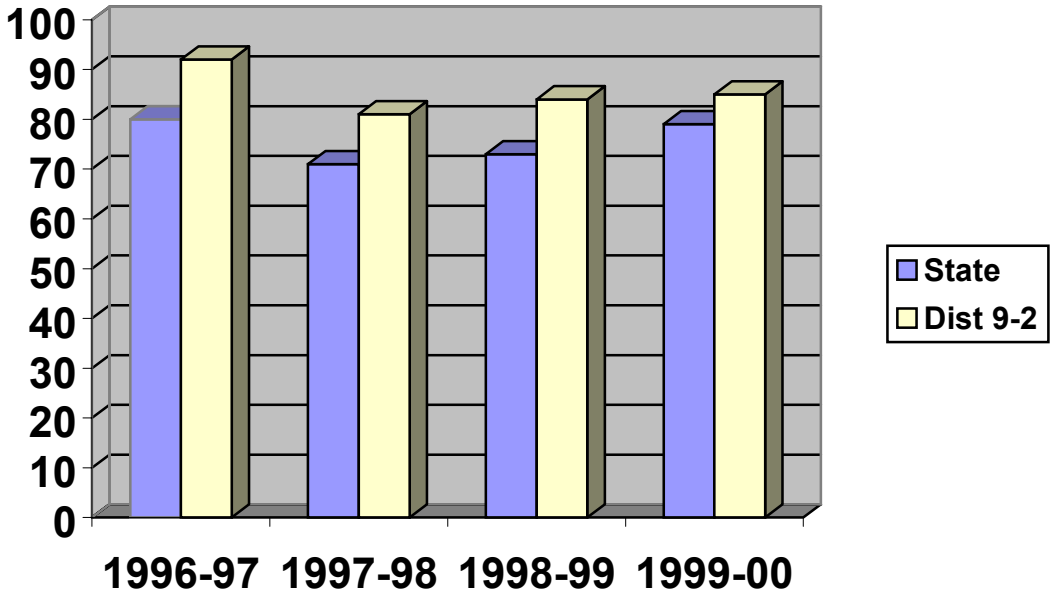
*Percent = number immunized / sample size
Sample size = 130

Individual Health District Report: District 9-2

The eligible sample from this district included 146 children born in November 1997. From the 146 children, 137 records were located. [Response Rate=93.8%]

- **The 4:3:1 immunization coverage estimate is 85.0 percent (113/133*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 47.4 percent (63/133)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 49:
District Immunization Rates at2 Years of Age for Health District 9-2 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	91.3%	84.1%	83.5%	88.0%
3 OPV/IPV	95.7%	92.7%	93.4%	90.2%
1 MMR	93.0%	87.8%	85.1%	91.0%
3 Hib	92.2%	93.9%	93.4%	95.5%
3 HepB	93.9%	95.1%	91.7%	91.7%
1 Varicella*	---	3.7%	27.3%	58.6%

*Varicella rates include shots given beyond the 2nd birthday

Table 49 reveals the coverage rates of each vaccine series by the second birthday. With the exception of the Varicella vaccine, coverage rates ranged from 88.0 to 95.5 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 50 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 50:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-2 by Study Year

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	132	99.2%
DTP2/DTaP2	130	97.7%
DTP3/DTaP3	117	88.0%
DTP4/DTaP4	1	0.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	132	99.2%
OPV/IPV2	128	96.2%
OPV/IPV3	21	15.8%
OPV/IPV4	1	0.8%
MMR1	3	2.3%
MMR2	0	0.0%
HIB1	132	99.2%
HIB2	130	97.7%
HIB3	117	88.0%
HIB4	2	1.5%
HIB5	0	0.0%
HEPB1	132	99.2%
HEPB2	127	95.5%
HEPB3	114	85.7%
HEPB4	7	5.3%
VAR1	5	3.8%
VAR2	0	0.0%

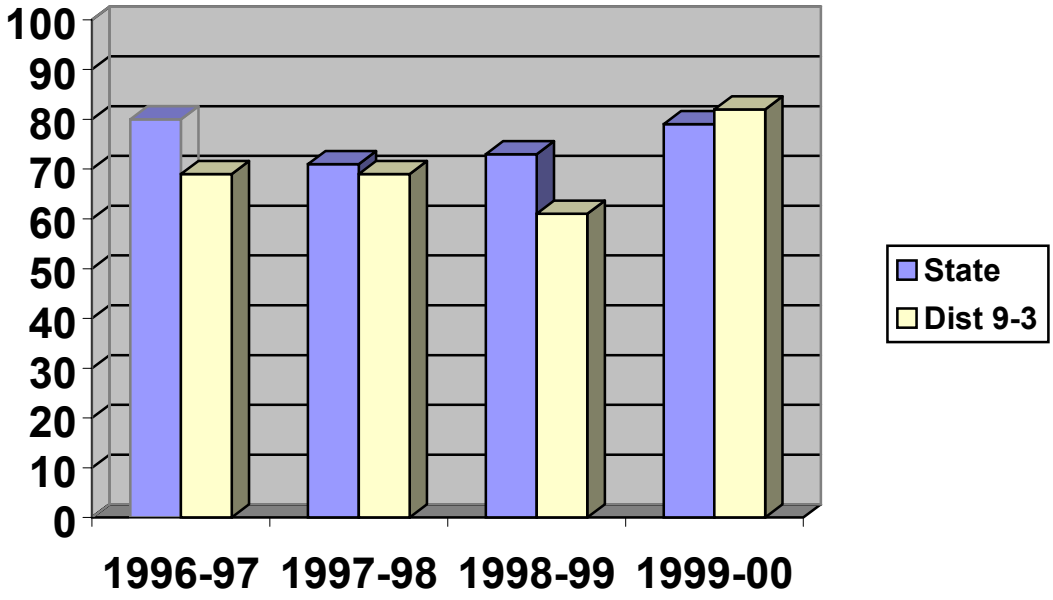
*Percent = number immunized / sample size
Sample size = 133

Individual Health District Report: District 9-3

The eligible sample from this district included 91children born in November 1997. From the 91 children, 76 records were located. [Response Rate=83.5%]

- **The 4:3:1 immunization coverage estimate is 82.2 percent (60/73*)**. This rate is higher than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 50.7 percent (37/73)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 51:
District Immunization Rates at 2 Years of Age for Health District 9-3 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	72.6%	72.1%	64.2%	82.2%
3 OPV/IPV	85.5%	94.3%	77.1%	86.3%
1 MMR	78.2%	76.4%	67.9%	87.7%
3 Hib	83.9%	85.7%	78.0%	89.0%
3 HepB	79.0%	85.7%	81.7%	87.7%
1 Varicella*	---	5.0%	25.7%	57.5%

***Varicella rates include shots given beyond the 2nd birthday

Table 51 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 82.2 to 89.0 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 52 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 52:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	69	94.5%
DTP2/DTaP2	68	93.2%
DTP3/DTaP3	59	80.8%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	69	94.5%
OPV/IPV2	67	91.8%
OPV/IPV3	27	37.0%
OPV/IPV4	0	0.0%
MMR1	5	5.8%
MMR2	0	0.0%
HIB1	69	94.5%
HIB2	68	93.2%
HIB3	51	69.9%
HIB4	1	1.4%
HIB5	0	0.0%
HEPB1	71	97.3%
HEPB2	69	94.5%
HEPB3	52	71.2%
HEPB4	1	1.4%
VAR1	2	2.7%
VAR2	0	0.0%

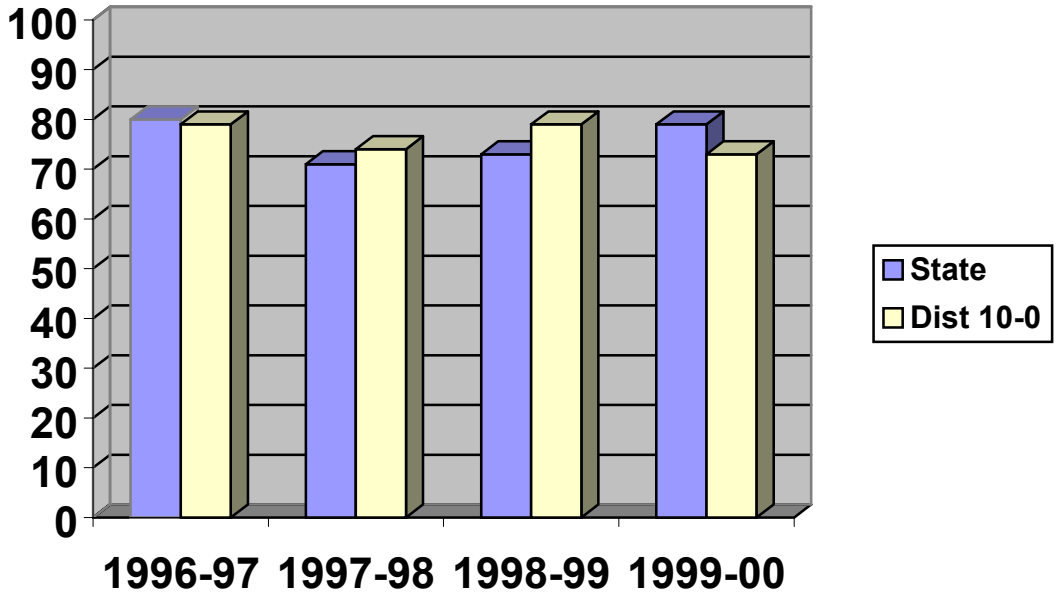
*Percent = number immunized / sample size
Sample size = 73

Individual Health District Report: District 10-0

The eligible sample from this district included 189 children born in November 1997. From the 189 children, 171 records were located. [Response Rate=90.5%]

- **The 4:3:1 immunization coverage estimate is 73.4 percent (113/154*)**. This rate is lower than the statewide 4:3:1 immunization rate of 78.8 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 52.6 percent (81/154)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 56.3 percent.

*Denominator excludes parental refusals and transferred records.

Table 53:
District Immunization Rates at 2 Years of Age for Health District 10-0 by Study Year

Vaccine	1996-97 Adequate Rates	1997-98 Adequate Rates	1998-99 Adequate Rates	1999-00 Adequate Rates
4 DTP/DTaP	79.0%	74.4%	78.9%	74.7%
3 OPV/IPV	85.7%	89.1%	86.5%	76.0%
1 MMR	81.9%	82.2%	84.8%	77.3%
3 Hib	86.7%	88.4%	87.7%	79.9%
3 HepB	81.0%	86.0%	87.7%	79.9%
1 Varicella*	---	11.6%	52.0%	55.8%

***Varicella rates include shots given beyond the 2nd birthday

Table 53 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 74.7 to 79.9 percent for the 1999-00 study data. For more information on Varicella rates, see Appendix D.

Table 54 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 54:
1999-00 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 10-0 by Study Year

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	125	81.2%
DTP2/DTaP2	125	81.2%
DTP3/DTaP3	118	76.6%
DTP4/DTaP4	3	1.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	125	81.2%
OPV/IPV2	125	81.2%
OPV/IPV3	36	23.4%
OPV/IPV4	0	0.0%
MMR1	2	1.3%
MMR2	0	0.0%
HIB1	125	81.2%
HIB2	125	81.2%
HIB3	105	68.2%
HIB4	3	1.9%
HIB5	0	0.0%
HEPB1	125	81.2%
HEPB2	125	81.2%
HEPB3	106	68.8%
HEPB4	2	1.3%
VAR1	4	2.6%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 154

Section V:
Discussion of Results

Section V: Discussion

Summary

The purpose of the fourth 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 1997-98. To assess these rates, the study drew an original sample of 4,328 children born in November 1997. The final sample of returned immunization records totaled 4,236 (91 records were lost in the data abstraction process). After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 4,086. Of these, 2,793 were located and make up the final sample.

The fourth year of the GIS, 1999-00, measured immunization coverage for 1997 at three levels:*

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

Of these three coverage levels, 4:3:1+3 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 1996-97, 1997-98,1998-99, and 1999-00. The newer 4:3:1+3 measure of

* *It must be remembered that the 1999-00 study is estimating 1997 rates. The 1998-99 study estimated 1996 rates, 1997-98 study estimated 1995 rates, and the 1996-97 study estimated rates for 1994.

coverage was added in 1997-98. Therefore, 4:3:1+3 rates can be compared using study data from 1997-98, 1998-99, and 1999-00.

The 1999-00 results reflect immunization rates for 1997. The results of the study indicate that, of the 2,793 children whose immunization records were located during 1999-00 data collection:

- 56.3 percent of two-year-olds born in November of 1997 in Georgia were adequately immunized with the 4:3:1+3 vaccine series, compared to 41.7 percent in those who were born in April of 1996.

- 78.8 percent of two-year-olds born in November of 1997 in Georgia were adequately immunized with the 4:3:1 vaccine series, compared to 73.3 percent of infants born in April 1996, 71.3 percent of those born in April of 1995 and 79.6 percent of those born in April of 1994.

Immunization rates in the individual health districts ranged from

- 60.7 percent to 94.5 percent in the 1999-00 study
- 53.8 percent to 96.1 percent in the 1998-99 study
- 49.7 percent to 88.4 percent in the 1997-98 study
- 50.0 percent to 92.2 percent in the 1996-97 study

The study investigated where the immunizations are being administered in Georgia (See Appendix E). In the fourth study year, 61.9 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

The greatest increase in rates from the 1998-99 study to the 1999-00 study was observed in the 4:3:1+3 vaccine series (41.9% to 56.3%). These rates

are low, because they represent an immunization schedule that was introduced in the last three years. In fact, the most recent addition to the series, the Varicella vaccine, was only recommended for use in 1995 and available statewide in January, 1997. The 1999-00 Georgia Immunization Study (GIS) measured Varicella rates for the third 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 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 as they rise.

In reviewing the 4:3:1 vaccine series, rates slightly increased statewide from the 1998-99 study (73.3 percent) to the 1999-00 study (78.8 percent) but are still less than the 79.6 percent coverage in the 1996-97 study. *

The results of the previous three years of the GIS study (1997-98, 1998-99, and 1999-00) show that immunization-specific coverage rates for the state remained relatively similar during the years when the shots were given, 1997-1998, 1996-97 and 1995-96, respectively. Rates for 3 DTP/DTaP, 4 DTP/DTaP, 3 OPV/IPV, 1 MMR, 3 Hib, 3 Hep B, and Varicella all increased from the 1998-99 study.

With the exception of Varicella, coverage rates demonstrated by the second, third, and fourth year of the GIS, (1997-98, 1998-99, and 1999-00) were less than the coverage rates found in the first year of the study, 1996-97. This is to say that, immunization rates for Georgia two-year-olds born in 1994 were higher than for those born in 1995, 1996, and 1997.

* It must be remembered that the 1999-00 study is estimating 1997 rates. The 1998-99 study is estimating 1996 rates, 1997-98 study is estimating 1995 rates, and the 1996-97 study estimated rates for 1994.

Strengths

1. This study represents Georgia's fourth successful statewide, population-based assessment of immunization coverage rates. The sampling methodology for the study, was originally developed by Dr. Joan Herold, Demographer/Survey Specialist at Emory University. 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. In the absence of a statewide registry, the study represents the current "state of the art" in this research area. 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 vaccine series.
   - Comparison of rates for children born in 1994, 1995, 1996, and 1997 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 10 percent for the 1999-00 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 November 1997 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 1997, 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 healthcare 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 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 area more often refused to participate (district 3-2, 3-4, 3-5, and 4-0). Response rates tended to be lower in the Metro area (district 2-0, 3-1, 3-2, 3-3, 3-5, and 4-0).

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 1997 who were residing in the state in 1999-2000. 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 November 1997 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 immunization in the state in 1997. 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 had been 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 1997-2000. 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 55: Data Used for 1998-99 Sample Size Estimates for the Georgia Immunization Study. Response rates and immunization coverage levels from the 1998-99 study were used in the sample size calculation for the 1999-00 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 1998-99 study. The final calculated sample size is shown in the last column (Column H) of Table 55. 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 46.7 percent to a high of 99.0 percent, with the average response rate for the state at 72.2 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 55:
Data Used for Sample Size Estimates

for the 1999-00 Study

A	B	C	D	E	F	G	H
Health District	**Nov 1997 Total Births**	**Nov 1997 Eligible Births**	**1998-99 4:3:1 Immunization Rates**	**1999-00 First Sample Estimate**	**1999-00 Second Sample Estimate**	**Return Rate based on 1998-99 Eligible Sample**	**1999-00 Adjusted Sample Size**
1-1	584	583	0.782	261.960	180.746	0.877	206
1-2	342	339	0.749	288.887	155.972	0.833	187
2-0	476	472	0.667	341.305	198.076	0.823	241
3-1	792	787	0.581	374.078	253.557	0.673	377
3-2	1089	1080	0.538	381.941	282.157	0.519	544
3-3	295	292	0.763	277.872	142.380	0.790	180
3-4	831	825	0.650	349.586	245.540	0.510	481
3-5	806	801	0.630	358.191	247.510	0.667	371
4-0	688	681	0.675	337.100	225.484	0.722	312
5-1	166	164	0.871	172.655	84.108	0.977	86
5-2	510	503	0.945	79.867	68.923	0.977	71
6-0	506	501	0.961	57.592	51.654	0.983	53
7-0	433	364	0.679	334.925	174.429	0.678	257
8-1	242	241	0.804	242.150	120.787	0.939	129
8-2	441	436	0.838	208.608	141.098	0.755	187
9-1	318	283	0.804	242.150	130.493	0.888	147
9-2	389	380	0.835	211.711	135.962	0.924	147
9-3	295	207	0.606	366.894	132.336	0.901	147
10-0	396	394	0.789	255.818	155.109	0.757	205
State	**9599**	**9333**	**0.746**	**270.699**	**164.543**	**0.780**	**4328**

Figure 23:
Explanations of Table 55
Data Used for Sample Size Estimates
For 1999-00 Study

Column A: Health District	District number.
Column B: November 1997 Total Births	Given. Source: DHR Vital Statistics Office.
Column C: November 1997 Eligible Births	
Column D: 1998-99 Immunization Rates	Given. Source: Georgia Birth Cohort Follow-up Study (1997-98).
Column E: First Sample Estimate - 1999-00 Study	Formula Used: 3.8416 x (D) (1 – D) / .0025
Column F: Second Sample Estimate - 1999-00 Study	Adjustment for small size district populations. Formula Used: E / (1 + E/C).
Column G: Estimated Return Rate (Based on 1999-00 Study)	Given. Source: Georgia Birth Cohort Follow-up Study (1998).
Column H: Adjusted Sample Size - 1999-00 Study	Formula Used: (Column F) / (Column G)

APPENDIX B:

LIST OF 1999-00 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

APPENDIX B: LIST OF 1999-00 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

Health District	Public Health Representative
1-1	Harold Griffin
1-2	Ann Vossen, R.N.
2-0	Janie Dalton,R.N.
3-1	Joy Stymest
3-2	Georgia Goseer, R.N.
3-3	Amy Valley, R.N.
3-4	Kathy Heidish, R.N.
3-5	Alan Sievert, M.D.
4-0	Sandy Blair, R.N.
5-1	Terry Avant, R.N.
5-2	Claire Morin, M.D.
6-0	Melba McNorril, R.N.
7-0	Regina Feaster, L.P.N.
8-1	Kirsten Wright, M.P.H
8-2	Jenny Howell, R.N.
9-1	Marianne Pappas
9-2	Glynda Woodard, R.N.
9-3	Debbie Dawson, R.N.
10-0	Noelle Broadnax, R.N.

APPENDIX C:

DATA COLLECTION FORM

APPENDIX D:

VARICELLA VACCINE AND CHICKEN POX DATA

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 56 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. Thus, the two year-old cut off was not applicable for the Varicella vaccine. Similarly, the previous two studies (1997-98 and 1998-99) did not implement a two-year cut off for the Varicella vaccine, largely because the vaccine had just been introduced into the medical community. In order to compare accurately this years Varicella study results with the previous two, a two-year-old cut off did not apply for Varicella.

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 medical physicians. The percent column is equal to the number of children who had chicken pox divided by the district's final sample size.

Table 56:
1999-00 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	73	44.0	75	45.2	1	0.006
1-2	79	54.1	85	58.2	7	0.048
2-0	105	80.2	107	81.7	1	0.008
3-1	123	63.7	128	66.3	2	0.010
3-2	124	63.9	131	67.5	3	0.015
3-3	42	50.0	44	52.4	0	0.0
3-4	314	86.5	325	89.5	2	0.006
3-5	124	55.9	127	57.2	1	0.005
4-0	121	63.0	126	65.6	0	0.0
5-1	47	58.8	49	61.3	1	0.013
5-2	34	61.8	34	61.8	1	0.018
6-0	28	59.6	29	61.7	0	0.0
7-0	91	53.5	91	53.5	1	0.006
8-1	64	59.8	66	61.7	2	0.019
8-2	96	62.7	101	66.0	1	0.007
9-1	59	45.4	67	51.5	0	0.0
9-2	70	52.6	78	58.6	5	0.038
9-3	38	52.1	42	57.5	5	0.068
10-0	86	55.8	90	58.4	7	0.045
Statewide	**1,718**	**61.5%**	**1,795**	**64.3%**	**40**	**0.014%**

Figure 24: 1999-00 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

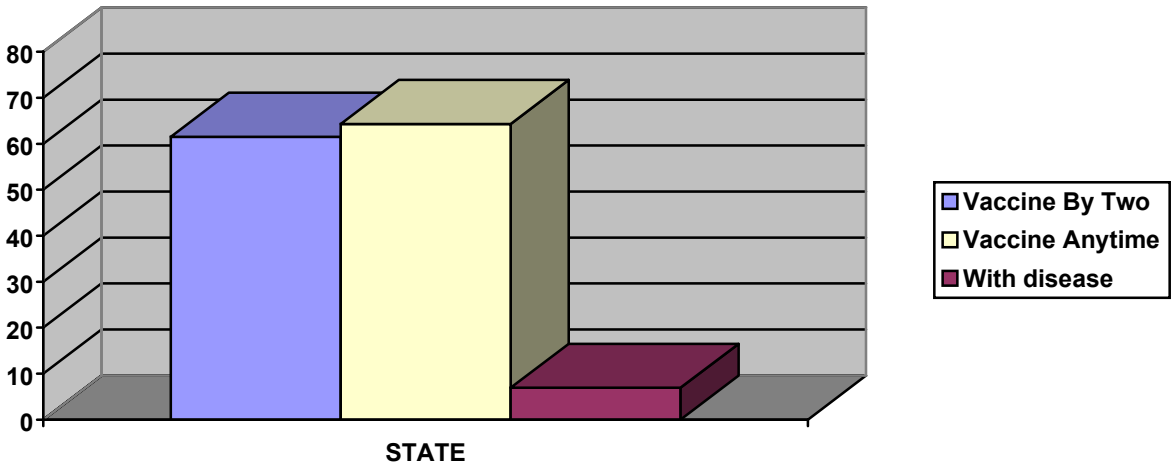


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time

Appendix E:

Provider of Immunizations

Appendix E: Provider of Immunizations

In previous years, information about the provider of the immunizations was collected by noting where the immunization information was found [Public Health, Private Health, or Both] and who provided the information [Health Department, Private Provider, or Parent]. **This was considered a proxy measure for where the shot was given.**

In Year Three (1998-99) and Four (1999-00), the data abstracter recorded the actual provider [public health, private provider, unknown] of each shot on the data form. 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 57.

Table 57:
Statewide Percentage of Shots by Provider: 1998-99 and 1999-00

Provider	1998-99 Total # of Shots Given	1998-99 Percentage	1999-00 Total # of Shots Given	1999-00 Percentage
Public Health Department	20,222	45.1%	11,248	29.0%
Private Physician	22,686	50.6%	23,984	61.9%
Unknown	1,934	4.3%	3,503	9.0%
Total	44,842	100.0%	38,735	100.0%

As shown in Table 57, in 1999-00, more than 60% of the shots recorded for the sampled children were given by a private provider.

Location of Immunizations by District [1999-00]

Table 58 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 58:
District Specific Percentage of Shots by Provider 1999-00

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	Percent	# Shots Given	Percent	# Shots Given	Percent	
1-1	1,021	51.7	872	44.2	80	4.1	1,973
1-2	497	24.9	1,449	72.6	49	2.5	1,995
2-0	663	35.5	900	48.3	302	16.2	1,865
3-1	499	18.8	1,523	57.5	629	23.7	2,651
3-2	777	30.6	1,526	60.2	233	9.2	2,536
3-3	205	19.1	574	53.4	295	27.5	1,074
3-4	504	8.9	4,362	77.1	795	14.0	5,661
3-5	730	25.9	1,860	65.9	233	8.2	2,823
4-0	956	35.8	1,628	61.0	86	3.2	2,670
5-1	624	51.8	520	43.2	60	5.0	1,204
5-2	372	46.3	431	53.6	1	0.1	804
6-0	230	34.9	395	59.8	35	5.3	660
7-0	829	36.1	1,279	55.6	191	8.3	2,299
8-1	364	23.1	1,207	76.3	10	0.6	1,581
8-2	595	26.5	1,339	59.8	307	13.7	2,241
9-1	254	14.4	1,440	81.7	69	3.9	1,763
9-2	1,156	57.9	792	39.7	47	2.4	1,995
9-3	321	31.0	633	61.2	80	7.8	1,034
10-0	651	34.1	1,254	65.8	1	0.1	1,906
State	11,248	29.04	23,984	61.92	3,503	9.04	38,735

In Year Four [1999-00]:

- In three districts, more than 50% of the shots were given in the **Public Health Departments.**
- In sixteen districts, more than 50% of the shots were given in the **Private sector.**

Results by region

- **North (districts 1-1, 1-2, 2-0, and 10-0)**

  In district 1-1 the health department provided the majority of vaccinations. However, in districts 1-2, 2-0 and 10-0 private physicians gave the majority of the immunizations.

- **Metro Atlanta (districts 3-1 through 3-5)**

  In the metro-Atlanta area more of the immunizations were administered in the private sector than in the public sector. District 3-4, Gwinnett County, exceeded all other districts with 77.1% of total shots given by private providers.

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

  Children in districts 4-0, 5-2, 6-0, and 7-0, received the majority of their shots at a private provider. In district 5-1 the health department administered 51.8 percent of immunizations to children.

- **South (districts 8-1, 8-2, 9-1, 9-2, 9-3)**

  Private providers provided the majority of vaccinations in all health districts except 9-2, where 57.9% were given by the health department. District 9-1 exceeds all other health districts in the state with 81.7% of immunizations given at a private physicians office.

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. In 1998-99 and again in 1999-00, a more direct method of collecting this data replaces the "proxy" measure used in former years. The comparisons reflect a movement of immunization services into the private sector in Georgia.

Table 59:
Location of Immunizations by District
Three Year Comparison
1996-97, 1997-98, 1998-99, 1999-00

District	Public Health Department				Private Physician			
	96-97*	97-98*	98-99**	99-00**	96-97*	97-98*	98-99**	99-00**
1-1	**87.7**	**82.9**	**55.9**	**51.7**	**4.3**	**5.4**	**44.1**	**44.2**
1-2	**74.4**	**61.1**	**34.5**	**24.9**	**14.1**	**20.4**	**63.6**	**72.6**
2-0	**57.0**	**65.2**	**60.5**	**35.5**	**33.7**	**23.2**	**39.3**	**48.3**
3-1	**58.6**	**57.4**	**41.9**	**18.8**	**18.5**	**37.2**	**56.0**	**57.5**
3-2	**70.8**	**69.4**	**24.9**	**30.6**	**20.1**	**30.0**	**59.3**	**60.2**
3-3	**73.2**	**57.0**	**34.8**	**19.1**	**4.2**	**35.4**	**39.6**	**53.4**
3-4	**74.1**	**63.9**	**17.5**	**8.9**	**21.8**	**33.3**	**80.2**	**77.1**
3-5	**52.7**	**58.6**	**24.4**	**25.9**	**31.3**	**33.8**	**65.7**	**65.9**
4-0	**77.3**	**95.9**	**62.4**	**35.8**	**5.1**	**4.1**	**36.3**	**61.0**
5-1	**92.1**	**59.4**	**44.5**	**51.8**	**6.6**	**27.4**	**55.3**	**43.2**
5-2	**93.5**	**97.9**	**60.1**	**46.3**	**6.0**	**1.4**	**38.8**	**53.6**
6-0	**65.3**	**63.6**	**30.0**	**34.9**	**28.1**	**21.7**	**70.0**	**59.8**
7-0	**91.8**	**62.9**	**60.5**	**36.1**	**7.4**	**23.1**	**37.1**	**55.6**
8-1	**59.4**	**60.5**	**60.9**	**23.1**	**38.4**	**30.2**	**35.1**	**76.3**
8-2	**82.4**	**77.3**	**70.3**	**26.5**	**16.6**	**13.6**	**29.7**	**59.8**
9-1	**94.2**	**91.9**	**41.9**	**14.4**	**3.2**	**1.5**	**52.8**	**81.7**
9-2	**97.4**	**87.8**	**81.3**	**57.9**	**0.9**	**9.8**	**17.1**	**39.7**
9-3	**88.9**	**76.5**	**52.0**	**31.0**	**0.8**	**8.8**	**47.4**	**61.2**
10-0	**92.5**	**74.8**	**40.7**	**34.1**	**2.8**	**8.9**	**57.9**	**65.8**
State Totals	**74.6**	**71.0**	**45.1**	**29.04**	**17.3**	**20.1**	**50.6**	**61.92**

*1996-97 and 1997-98: The "source of information" (who provided the shot information) was reported as a proxy measure of where the shot was given.

1998-99 and 1999-00 actual location of each shot was recorded by abstracters.

Four Year Comparison: Summary of Table 59

In 1996-97* 74.6% of the records were found in the public health department.
17.3% of the records were found in the private sector
8.0% of the records had shots found in both public and private sector

In 1997-98* 71.0% of the records were found in the public health department
20.1 of the records were found in the private sector
8.9% of the records had shots found in both public and private sector

****In the first two years of the GIS, where the shots were given was measured by a proxy measure consisting of who provided the information about the shot. (Health Department, Private Doctor, Parent)***

In 1998-99** 45.1% of the shots were given in the public health department
50.6% of the shots were given in the private sector
4.3% of the shot locations were unknown

In 1999-00** 29.0% of the shots were received at the health department
61.9% of the shots were given in the private sector
9.0% of the shot locations were unknown

*****Location of each shot was recorded by the abstracter in 1998-99 and the public health representative in 1999-00***

APPENDIX F:

MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

APPENDIX I: 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 rates, 4:3:1 rates, and 3:3:1 rates. These margins of error can be found in Tables 60-62. 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 4:3:1immunization rate is as follows:

- With 95% confidence, the true statewide 4:3:1 immunization rate for infants born in 1997 is between 76.8 and 79.8 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 immunization coverage rates
- Statewide 4:3:1 immunization coverage rates
- Statewide 3:3:1 immunization coverage rates
- District 4:3:1+3 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 60:
Margins of Error for 1999-00

Statewide and District 4:3:1+3 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	166	38.55	+/- 7.4	31.15 – 45.95
1-2	146	46.58	+/- 8.1	38.48 – 54.68
2-0	131	77.10	+/- 7.2	69.90 – 84.30
3-1	193	57.51	+/- 7.0	50.51 – 64.51
3-2	194	54.64	+/- 7.0	47.64 – 61.64
3-3	84	40.48	+/- 10.5	29.98 – 50.98
3-4	363	85.12	+/- 3.7	81.42 – 88.82
3-5	222	51.35	+/- 6.6	44.75 – 57.95
4-0	192	57.81	+/- 7.0	50.81 – 64.81
5-1	80	57.50	+/- 10.8	46.70 – 68.30
5-2	55	56.36	+/- 13.1	43.26 – 69.46
6-0	47	53.19	+/- 14.3	38.89 – 67.49
7-0	170	46.47	+/- 7.5	38.97 – 53.97
8-1	107	53.27	+/- 9.5	43.77 – 62.77
8-2	153	55.56	+/- 7.9	47.66 – 63.46
9-1	130	39.23	+/- 8.4	30.83 – 47.63
9-2	133	47.37	+/- 8.5	38.87 – 55.87
9-3	73	50.68	+/- 11.5	39.18 – 62.18
10-0	154	52.60	+/- 7.9	44.70 – 60.50
Statewide Rate (weighted)	**2,793**	**55.5%**	**+/- 1.8%**	**53.70 – 57.30%**

Table 61:
Margins of Error for 1999-00
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	166	67.47	+/- 7.1	60.37 – 74.57
1-2	146	75.34	+/- 7.0	68.34 – 82.34
2-0	131	88.55	+/- 5.5	83.05 – 94.05
3-1	193	75.65	+/- 6.1	69.55 – 81.75
3-2	194	69.59	+/- 6.5	63.09 – 76.09
3-3	84	60.71	+/- 10.4	50.31 – 71.11
3-4	363	94.49	+/- 2.3	92.19 – 96.79
3-5	222	64.86	+/- 6.3	58.56 – 71.16
4-0	192	79.69	+/- 5.7	73.99 – 85.39
5-1	80	91.25	+/- 6.2	85.05 – 97.45
5-2	55	83.64	+/- 9.8	73.84 – 93.44
6-0	47	72.34	+/- 12.8	59.54 – 85.14
7-0	170	77.06	+/- 6.3	70.76 – 83.36
8-1	107	85.98	+/- 6.6	79.38 – 92.58
8-2	153	83.66	+/- 5.9	77.76 – 89.56
9-1	130	78.46	+/- 7.1	71.36 – 85.56
9-2	133	84.96	+/- 6.1	78.86 – 91.06
9-3	73	82.19	+/- 8.8	73.39 – 90.99
10-0	154	73.38	+/- 7.0	66.38 – 80.38
Statewide Rate (weighted)	**2,793**	**78.30%**	**+/- 1.5**	**76.80 – 79.80%**

Table 62:
Margins of Error for 1999-00
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	166	71.08	+/- 6.9	64.18 – 77.98
1-2	146	80.14	+/- 6.5	73.64 – 86.64
2-0	131	88.55	+/- 5.5	83.05 – 94.05
3-1	193	78.24	+/- 5.8	72.44 – 84.04
3-2	194	74.23	+/- 6.2	68.03 – 80.43
3-3	84	66.67	+/- 10.1	56.57 – 76.77
3-4	363	95.32	+/- 2.2	93.12 – 97.52
3-5	222	69.37	+/- 6.1	63.27 – 75.47
4-0	192	82.81	+/- 5.3	77.51 – 88.11
5-1	80	93.75	+/- 5.3	88.45 – 99.05
5-2	55	87.27	+/- 8.8	78.47 – 96.07
6-0	47	82.98	+/- 10.7	72.28 – 93.68
7-0	170	82.94	+/- 5.7	77.24 – 88.64
8-1	107	86.92	+/- 6.4	80.52 – 93.32
8-2	153	86.93	+/- 5.3	81.63 – 92.23
9-1	130	82.31	+/- 6.6	75.71 – 88.91
9-2	133	87.22	+/- 5.7	81.52 – 92.92
9-3	73	84.93	+/- 8.2	76.73 – 93.13
10-0	154	74.68	+/- 6.9	67.78 – 81.58
Statewide Rate (weighted)	**2,793**	**81.89%**	**+/- 1.4**	**80.49 – 83.29%**