GEORGIA IMMUNIZATION STUDY

2001 Final Report

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

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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 fifth 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 2001 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. This year, immunization rates for children born in January 1999 were assessed. The current rates are compared throughout this report with data from the previous four years of the study. [*]

Public health representatives in each of the nineteen health districts collected immunization data from both public and private health care providers.

The Principal Investigator and Co-Project 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 November 2000. During December 2000, 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, 2001.

[*] Throughout this report, we refer to study years one, two, three, four, and five as 1996-97, 1997-98, 1998-99, 1999-00, and 2001 respectively. The results from these five study years refer to rates for 1994, 1995, 1996, 1997, and 1999 respectively.

During January, a training session for the public health representatives was held in Macon, Georgia. Data were collected from February 2001 through August, 2001. (Limited data collection continued on some difficult to obtain records through the end of September 2001). 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	December, 2000
Initial notification of public health community Immunization Coordinators Health Directors	December, 2000
Initial notification of private health community	January, 2001
One day training for public health representatives	January, 2001
Data collection period	February – August, 2001
Data entry period	February – November, 2001
Double data entry of 5% of data forms	October, 2001
Final data cleaning and analysis of data	November – December, 2001
Final Report	January, 2002

Data collection was extended beyond August 2001 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 the immunization site (public or private provider) is included in Appendix E. Margins of error for immunization coverage rates are included in Appendix F.

SECTION II:
METHODOLOGY

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Research Design

The fifth year of the Georgia Immunization Study employed a non-experimental retrospective cohort research design in order to ascertain the immunization coverage rate for children born in the State of Georgia in January 1999. 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 January 2001. Identifying information about the children and their parents was collected from birth certificates.

Target and Sample Populations

The target population of the fifth year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 1999. A sample size of 4,205 children born in the month of January 1999 was selected for the study. The sample design allowed for independent estimates for each of the 19 health districts in the state. (See Appendix A for a description of the sampling plan.) The final estimate for the state is based on weighted data to account for differential probabilities of selection for each health district.

Dr. John Carter, Epidemiologist and Assistant Professor at the Rollins School of Public Health, drew a stratified random sample (by health district) from the total births in the state for January 1999. 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
- Medicaid status of mother at birth of child
- Mother's first, middle, and last name
- Father's first, middle, and last name (if available)
- Mother's race
- Mother's level of education

Preparation for Data Collection

Public health representatives in each health district completed the data collection procedures. Division of Public Health staff trained the representatives in Macon, Georgia on January 17th, 2001. 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 five.

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 (e.g., phone, fax, personal visit) most convenient to the doctor's office. In most cases, nurses, office managers, and records clerks were the main contacts for representatives collecting data in private physician offices.

Representatives returned completed data collection forms to the Georgia Immunization Program on a weekly basis via 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 five 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 97.0% was found.

Analysis Plan

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

SECTION III:

RESULTS OF STATEWIDE ANALYSES

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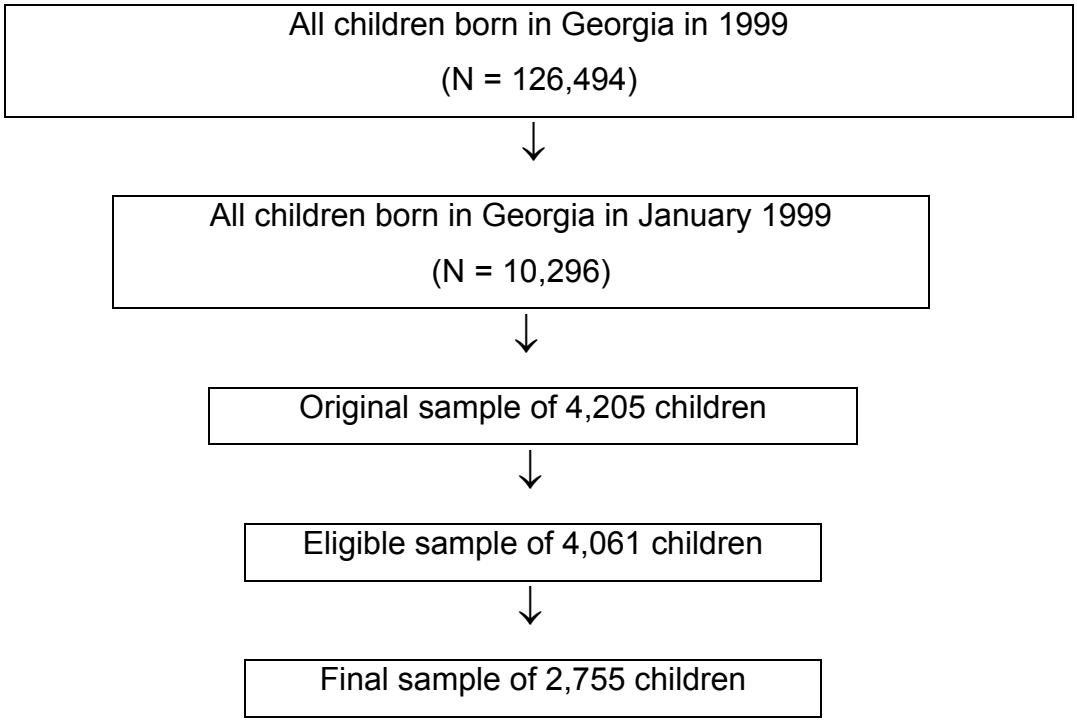
Sampling

The sample of 4,205 children was drawn from 10,296 children born in Georgia in January 1999. A total of 126,494 children were born in Georgia during 1999.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 4,061. (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 4,061 children in the eligible sample, 2,755 children were located, 1,225 children never were located and 81 parental refusals were removed. The resulting final sample consisted of 2,755 children. The final sample represents the children for whom parental consent was given to have their child's immunization record included in this study. The children who were never

located were those for whom no evidence beyond the birth certificate could be found to confirm that the child existed. The final sample of 2,755 children represented 67.8 percent of the eligible sample.

Table 2:

Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	**4,205**	**100.0%**
Deceased	5	0.1%
Adopted	37	0.9%
Moved out of state	92	2.2%
Military	10	0.2%
Eligible Sample	**4,061**	96.6%
Eligible Sample	**4,061**	**100.0%**
Records Not Located /Eligibility Unknown *	1,306	32.2%
Final Sample (Located Records)**	**2,755**	67.8%

* **Records Not Located / Eligibility Unknown** - This category refers to records where no evidence of a child's existence was found beyond birth certificate data (including those records where only one Hepatitis B shot was given at birth [n=75] or if a parent refused to participate in the study).

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

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

Response Rates

Table 3 and Figure 2 depict the district and state response rates for the 2001 study. The response rates are the number of records located divided by the total number of records in the sample. Response rates provide some indication of the ease or difficulty of accessing records of the children in the study as well as the quality of data collection. As noted in the last column of Table 3, response rates are reported - using the eligible sample as the total. In reviewing the response rates based on the eligible sample, the district response rates range from a low of 41.8 percent to a high of 97.0 percent, with a statewide average response rate of 69.8 percent.

Table 3:

2001 Eligible Sample, Number Located and Response Rates by District

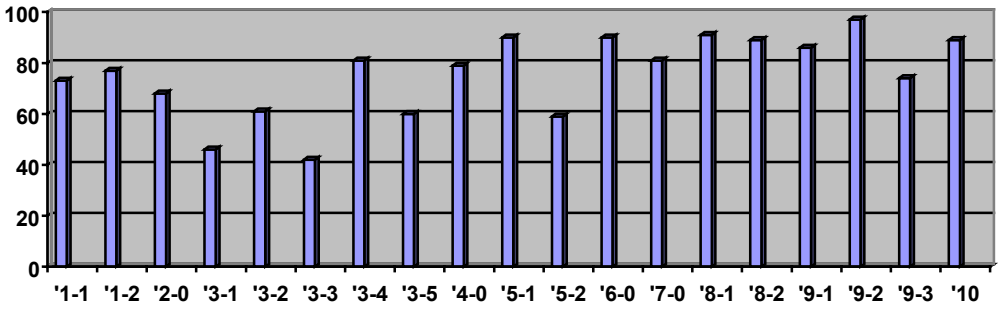
Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	233	171	73.4%
1-2	202	155	76.7%
2-0	199	136	68.3%
3-1	384	175	45.6%
3-2	539	327	60.7%
3-3	282	118	41.8%
3-4	100	81	81.0%
3-5	362	216	59.7%
4-0	266	209	78.6%
5-1	67	60	89.6%
5-2	188	111	59.0%
6-0	180	162	90.0%
7-0	210	170	81.0%
8-1	114	104	91.2%
8-2	149	133	89.3%
9-1	145	124	85.5%
9-2	135	131	97.0%
9-3	129	96	74.4%
10-0	177	157	88.7%
State	**4,061**	**2,836**	**69.8%**

*sample includes parental refusals

**number located / eligible sample

Figure 2

2001 Response Rates by District



Georgia Health Districts

Parent Refusals by District:

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

Table 4:
Parent Refusals by Health District for the 2001 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	171	5	2.9
1-2	155	9	5.8
2-0	136	1	0.7
3-1	175	1	0.6
3-2	327	30	9.2
3-3	118	0	0.0
3-4	81	2	2.5
3-5	216	20	9.3
4-0	209	3	1.4
5-1	60	0	0.0
5-2	111	1	0.9
6-0	162	0	0.0
7-0	170	3	1.8
8-1	104	1	1.0
8-2	133	0	0.0
9-1	124	1	0.8
9-2	131	0	0.0
9-3	96	1	1.0
10-0	157	3	1.9
Total	**2,836**	**81**	**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 2,755 children (children located). All reported immunization rates include information from both public and private providers. Since "adequate immunization status" is defined differently by different authorities, the Georgia Immunization Study has evaluated immunization status in several different ways:

- "4:3:1+3" 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 four 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 2,755 children who were located in 2001, 66.7 percent were adequately immunized at the 4:3:1+3 level. This percent of adequately immunized children increased from 56.3 percent in 1999-00.

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

Status	1997-98		1998-99		1999-00		2001	
	#	%	#	%	#	%	#	%
Adequately Immunized	474	16.0	1,360	41.9	1,573	56.3	1,837	66.7
Inadequately Immunized	2,078	84.0	2,100	58.1	1,220	43.7	918	33.3

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

Table 6 illustrates the percent of the children in the final sample who were adequately immunized with the 4:3:1 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 percent in the 1999-00 study, but decreased slightly to 75.1 percent in the 2001 assessment.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1996-97	2,369	79.6	601	20.4
1997-98	1,821	71.3	731	28.7
1998-99	2,511	73.3	949	26.7
1999-00	2,202	78.8	591	21.2
2001	2,068	75.1	687	24.9

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

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

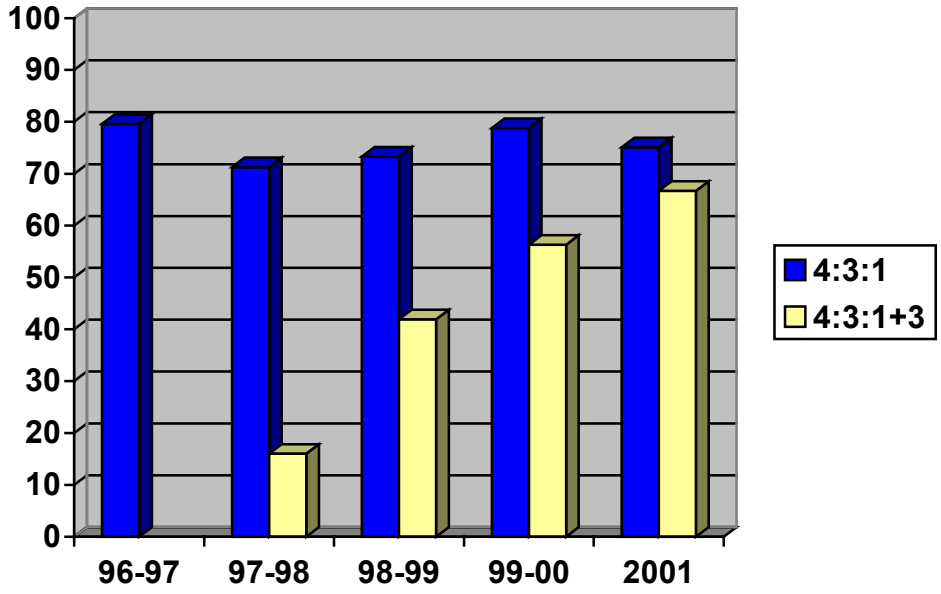


Figure 3 reveals the statewide 4:3:1 coverage rates for the 1996-97, 1997-98, 1998-99, 1999-00 and 2001 studies. The figure also shows statewide 4:3:1+3 vaccination coverage for the 1997-98, 1998-99, 1999-00 and 2001 studies. Varicella was not recorded for the 1996-97 study, therefore the 4:3:1+3 rate 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 while increasing in the 1999-00 study to 82.0 percent. However, in the 2001 study the 3:3:1 rate decreased to 78.9 percent.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1996-97	2,482	83.6	488	16.4
1997-98	2,005	78.1	547	21.9
1998-99	2,685	78.4	775	21.6
1999-00	2,290	82.0	503	18.0
2001	2,175	78.9	580	21.1

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

The statewide immunization status for each individual vaccine series is located in Table 8. This table illustrates the number and percent of children who were adequately immunized with each of the recommended vaccines. Vaccines which are part of the 4:3:1+3 shot series are shown here. In 1997-98, 1998-99, 1999-00, and 2001 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, to 64.3 percent in 1999-00, and to 77.9 percent in 2001. (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 Vaccine Series by Study Year

Vaccine	1996-97		1997-98		1998-99		1999-00		2001	
	Number	Percent	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	2,392	86.8
4 DTP/DTaP	2,433	81.9	1,861	72.9	2,545	74.2	2,233	79.9	2,093	76.0
3 OPV/IPV	2,677	90.1	2,186	85.4	2,864	83.6	2,358	84.4	2,226	80.8
1 MMR	2,533	85.3	2,063	80.8	2,752	80.2	2,363	84.6	2,258	82.0
3 Hib	2,508	84.4	2,141	83.6	2,866	83.6	2,441	87.4	2,322	84.3
3 Hep B	2,464	83.0	2,133	83.2	2,839	82.9	2,422	86.7	2,308	83.8
1 Varicella*	NA	NA	555	19.0	1,620	47.1	1,795	64.3	2,147	77.9

* 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, 1999-00, and 2001 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 97-98	Percent* 97-98	Number 98-99	Percent* 98-99	Number 99-00	Percent* 99-00	Number 2001	Percent* 2001
DTP/DTaP1	2,404	94.2%	3,071	88.8%	2,588	92.7%	2,507	91.0%
DTP/DTaP2	2,282	89.4%	2,976	86.0%	2,507	89.8%	2,426	88.1%
DTP/DTaP3	2,049	80.3%	2,712	78.4%	2,327	83.3%	2,214	80.4%
DTP/DTaP4	61	2.4%	81	2.3%	25	0.9%	12	0.4%
DTP/DTaP5	0	0.0%	0	0.0%	1	0.0%	0	0.0%
OPV/IPV1	2,389	93.6%	3,063	88.5%	2,586	92.6%	2,504	90.9%
OPV/IPV2	2,268	88.9%	2,965	85.7%	2,493	89.3%	2,412	87.5%
OPV/IPV3	1,850	72.5%	2,411	69.7%	742	26.6%	601	21.8%
OPV/IPV4	9	0.4%	8	0.2%	7	00.3%	1	0.0%
MMR1	83	3.3%	206	6.0%	117	4.2%	87	3.2%
MMR2	4	0.2%	1	0.0%	1	0.0%	0	0.0%
HIB1	2,324	91.1%	3,024	87.4%	2,569	92.0%	2,492	90.5%
HIB2	2,190	85.8%	2,925	84.5%	2,482	88.9%	2,398	87.0%
HIB3	1,935	75.8%	2,612	75.5%	2,220	79.5%	1,720	62.4%
HIB4	48	1.9%	99	2.9%	61	2.2%	27	1.0%
HIB5	0	0.0%	0	0.0%	1	0.0%	1	0.0%
HEPB1	2,404	94.2%	3,068	88.7%	2,616	93.7%	2,508	91.0%
HEPB2	2,283	89.5%	2,961	85.7%	2,527	90.5%	2,449	88.9%
HEPB3	1,825	71.5%	2,419	69.9%	2,087	74.7%	1,803	65.4%
HEPB4	21	0.8%	15	0.4%	23	0.8%	14	0.5%
VAR1	37	1.5%	160	4.6%	150	5.4%	118	4.3%
VAR2	0	0.0%	0	0.0%	0	0.0%	0	0.0%

*percents are calculated as (number immunized/sample size).
Sample Size for 1997-98 study = 2,552; 1998-99 study = 3,460; 1999-00 study = 2,793; 2001 study = 2,755.

Table 10 shows the 1996-97, 1997-98, 1998-99, 1999-00, and 2001 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 2001 margin of error for each health district ranges from +/- 3.7 percent to +/- 9.4 percent. The District level 2001 4:3:1 immunization rates range from 42.4 percent to 94.8 percent. Of the 19 health districts, three had an immunization coverage rate over 90 percent and four districts had 2001 coverage rates between 80 and 90 percent. The following summary highlights the changes in 4:3:1 coverage rates between 1999-00 and 2001:

- Coverage increased between 0 and 5 percent in two districts (District 1-2 and 4-0)
- Coverage increased between 5 and 15 percent in seven districts (District 1-1, 2-0, 3-5, 6-0, 8-2, 9-2 and 10-0)
- Coverage fell between 5 and 10 percent in six districts (Districts 3-1, 3-3, 5-1, 7-0, 8-1, and 9-1)
- Coverage fell between 10 and 25 percent in three districts (Districts 3-4, 5-2, and 9-3)
- Coverage decreased 27 percent in one district (District 3-2)

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

Dist	1996-97		1997-98		1998-99		1999-00		2001	
	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error
1-1	90.2	+/- 4.4	81.5	+/- 6.6	78.2	+/- 6.8	67.5	+/- 7.1	78.9	+/-6.2
1-2	86.6	+/- 5.6	71.7	+/- 8.3	74.9	+/- 6.4	75.3	+/-7.0	78.1	+/-6.7
2-0	90.1	+/- 4.4	78.9	+/- 9.2	66.7	+/- 6.8	88.5	+/-5.5	94.8	+/-3.7
3-1	72.9	+/- 6.1	75.3	+/- 5.6	58.1	+/- 6.5	75.6	+/-6.1	70.7	+/-6.8
3-2	70.0	+/- 5.8	49.7	+/- 7.1	53.8	+/- 5.4	69.6	+/-6.5	42.4	+/-5.6
3-3	50.0	+/- 8.1	85.5	+/- 5.4	76.3	+/- 7.1	60.7	+/-10.4	57.6	+/-8.9
3-4	84.1	+/- 5.7	57.4	+/- 9.6	65.0	+/- 5.6	94.5	+/-2.3	75.9	+/-9.4
3-5	75.6	+/- 5.7	58.3	+/- 7.6	63.0	+/- 5.5	64.9	+/-6.3	75.5	+/-6.0
4-0	85.4	+/- 5.5	58.7	+/- 9.5	67.5	+/- 5.6	79.7	+/-5.7	83.5	+/-5.1
5-1	82.7	+/- 8.6	78.3	+/- 7.8	87.1	+/- 7.1	91.3	+/-6.2	85.0	+/-9.0
5-2	75.9	+/- 5.9	71.8	+/- 7.2	94.5	+/- 2.8	83.6	+/-9.8	69.1	+/-8.6
6-0	83.2	+/- 6.0	76.6	+/- 7.1	96.1	+/- 2.8	72.3	+/-12.8	88.9	+/-4.8
7-0	74.8	+/- 7.8	71.8	+/- 5.8	67.9	+/- 7.8	77.1	+/-6.3	73.1	+/-6.7
8-1	88.8	+/- 5.5	88.4	+/- 6.8	80.4	+/- 8.1	86	+/-6.6	76.7	+/-8.2
8-2	91.9	+/- 3.9	81.4	+/- 9.1	83.8	+/- 6.1	83.7	+/-5.9	93.2	+/-4.3
9-1	80.0	+/- 6.4	66.4	+/- 7.8	80.4	+/- 6.5	78.5	+/-7.1	69.1	+/-8.2
9-2	92.2	+/- 4.9	80.5	+/- 8.6	83.5	+/- 6.6	85	+/-6.1	90.8	+/-4.9
9-3	69.4	+/- 8.1	68.6	+/- 7.7	60.6	+/- 9.2	82.2	+/-8.8	71.6	+/-9.1
10-0	79.0	+/- 7.8	73.6	+/- 7.6	78.9	+/- 6.1	73.4	+/-7.0	84.4	+/-5.7
State	**79.6**	**+/- 1.5**	**71.3**	**+/- 1.8**	**73.3**	**+/- 1.5**	**78.8**	**+/-1.5**	**75.1**	**+/-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, 1999-00, and 2001 data collection periods.

As shown in Table 11, 2001 district immunization rates for the DTP/DTaP vaccines ranged from 42.4 percent to 94.8 percent, with a statewide rate of 76.0 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, or the 1999-00 rate of 79.9 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 4 DTP/DTaP	1999-00 Rates 4 DTP/DTaP	2001 Rates 4 DTP/DTaP
1-1	90.2%	83.0%	78.2%	67.5%	79.5%
1-2	85.9%	72.6%	75.4%	77.4%	79.5%
2-0	91.2%	80.3%	67.7%	89.3%	94.8%
3-1	73.4%	77.9%	59.0%	77.7%	70.7%
3-2	72.1%	51.8%	55.1%	71.1%	42.4%
3-3	69.6%	86.1%	76.3%	63.1%	61.0%
3-4	84.7%	59.4%	66.4%	94.8%	75.9%
3-5	79.2%	61.3%	64.4%	66.2%	77.0%
4-0	86.1%	61.5%	69.0%	79.7%	83.5%
5-1	84.0%	79.2%	87.1%	91.3%	86.7%
5-2	77.4%	72.5%	96.5%	83.6%	72.7%
6-0	83.9%	76.6%	96.1%	74.5%	89.5%
7-0	78.2%	73.1%	69.3%	77.1%	74.3%
8-1	90.4%	88.4%	81.5%	86.9%	77.7%
8-2	94.6%	81.4%	84.5%	85.6%	94.7%
9-1	79.3%	67.1%	80.4%	80.8%	69.9%
9-2	91.3%	84.1%	83.5%	88.0%	92.4%
9-3	72.6%	72.1%	64.2%	82.2%	71.6%
10-0	79.0%	74.4%	78.9%	74.7%	85.1%
State	**81.9%**	**72.9%**	**74.2%**	**79.9%**	**76.0%**

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

Table 12 shows the 1996-97, 1997-98, 1998-99, 1999-00, and 2001 state and district rates for the OPV/IPV vaccines. The 2001 district coverage rates for these vaccines varied between 45.5 percent and 97.0 percent. The 2001 statewide immunization rate for OPV/IPV was 80.8 percent, which is lower than the previous year's study rates.

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	2001 Rates 3 OPV/IPV
1-1	96.0%	88.1%	90.8%	72.3%	88.6%
1-2	93.7%	88.5%	86.9%	82.2%	86.3%
2-0	96.7%	93.4%	73.7%	88.5%	97.0%
3-1	84.7%	84.4%	72.5%	79.3%	75.3%
3-2	83.8%	75.4%	64.9%	76.8%	45.5%
3-3	75.0%	88.5%	93.5%	71.4%	69.5%
3-4	91.7%	64.4%	72.9%	96.4%	77.2%
3-5	89.6%	77.9%	76.4%	75.7%	83.7%
4-0	93.0%	83.7%	80.2%	85.9%	86.4%
5-1	89.3%	90.6%	92.9%	93.8%	93.3%
5-2	86.9%	85.9%	98.0%	87.3%	81.8%
6-0	91.3%	91.2%	98.3%	85.1%	93.2%
7-0	88.2%	93.2%	83.2%	85.9%	78.4%
8-1	97.6%	94.2%	94.6%	87.9%	84.5%
8-2	97.3%	88.6%	90.1%	90.8%	96.2%
9-1	93.3%	80.7%	87.4%	88.5%	79.7%
9-2	95.7%	92.7%	93.4%	90.2%	92.4%
9-3	85.5%	84.3%	77.1%	86.3%	76.8%
10-0	85.7%	89.1%	86.5%	76.0%	88.3%
State	**90.1%**	**85.4%**	**83.6%**	**84.4%**	**80.8%**

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

Table 13 shows the 1996-97, 1997-98, 1998-99, 1999-00, and 2001 state and district rates for MMR. The 2001 district rates for MMR ranged from a low of 45.1 percent to a high of 97.0 percent, with a statewide rate of 82.0 percent coverage. This statewide rate for the MMR vaccine decreased from the 1999-00 rate of 84.6 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	2001 Rates 1 MMR
1-1	95.4%	90.4%	86.6%	73.5%	89.2%
1-2	91.5%	85.8%	84.6%	83.6%	85.6%
2-0	93.4%	85.5%	72.0%	90.1%	97.0%
3-1	77.8%	78.4%	64.0%	81.9%	77.0%
3-2	80.4%	71.2%	65.8%	77.8%	45.1%
3-3	54.1%	88.5%	84.9%	70.2%	74.6%
3-4	87.9%	63.4%	69.7%	96.4%	83.5%
3-5	84.6%	68.1%	73.3%	71.6%	87.8%
4-0	91.1%	69.2%	73.1%	84.9%	86.4%
5-1	88.0%	84.0%	91.8%	96.3%	91.7%
5-2	81.4%	80.5%	95.7%	90.9%	82.7%
6-0	84.6%	84.7%	98.3%	87.2%	95.1%
7-0	83.2%	92.3%	83.2%	85.3%	80.2%
8-1	91.2%	95.3%	89.1%	90.7%	82.5%
8-2	94.6%	85.7%	91.5%	88.9%	97.0%
9-1	90.7%	72.1%	86.7%	85.4%	79.7%
9-2	93.0%	87.8%	85.1%	91.0%	93.1%
9-3	78.2%	76.4%	67.9%	87.7%	80.0%
10-0	81.9%	82.2%	84.8%	77.3%	89.6%
State	**85.3%**	**80.4%**	**80.2%**	**84.6%**	**82.0%**

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

As shown in Table 14, 2001 district immunization rates for the Hib vaccine varied between 45.5 and 97.5 percent. The statewide Hib coverage rate in 2001 was 84.3 percent, a decrease from the 1999-00 statewide rate of 87.4 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	2001 Rates 3 Hib
1-1	92.5%	88.9%	90.8%	76.5%	89.2%
1-2	80.3%	89.4%	88.0%	86.3%	95.2%
2-0	96.7%	88.2%	73.1%	88.5%	96.3%
3-1	75.4%	83.5%	71.6%	85.0%	83.9%
3-2	76.3%	69.1%	65.2%	79.9%	45.5%
3-3	64.9%	87.9%	93.5%	79.8%	81.4%
3-4	80.3%	59.4%	70.4%	97.5%	92.4%
3-5	84.6%	74.8%	76.7%	77.0%	89.3%
4-0	91.1%	79.8%	81.0%	88.5%	88.3%
5-1	84.0%	89.6%	94.1%	96.3%	91.7%
5-2	85.4%	81.2%	98.0%	96.4%	84.5%
6-0	87.2%	92.0%	98.3%	87.2%	97.5%
7-0	72.3%	88.5%	85.4%	85.3%	82.6%
8-1	96.8%	96.5%	94.6%	92.5%	81.6%
8-2	85.5%	87.1%	90.8%	92.8%	92.5%
9-1	93.3%	81.4%	86.0%	91.5%	81.3%
9-2	92.2%	93.9%	93.4%	95.5%	95.4%
9-3	83.9%	85.7%	78.0%	89.0%	81.1%
10-0	86.7%	88.4%	87.7%	79.9%	94.2%
State	**84.4%**	**83.6%**	**83.6%**	**87.4%**	**84.3%**

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 2001, the district coverage rates varied from a low of 44.4 percent to 95.6 percent. The 2001 statewide rate of 83.8 percent for the Hepatitis B vaccine was lower than the 1999-00 statewide rate of 86.7 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	2001 Rates 3 Hep B
1-1	94.8%	92.6%	88.0%	76.5%	92.8%
1-2	86.6%	85.8%	86.3%	86.3%	93.2%
2-0	92.8%	88.2%	73.1%	89.3%	95.6%
3-1	74.4%	82.3%	72.1%	85.5%	82.8%
3-2	78.8%	74.3%	62.8%	79.4%	44.4%
3-3	66.9%	84.8%	92.8%	76.2%	81.4%
3-4	75.2%	62.4%	72.2%	97.5%	86.1%
3-5	83.3%	75.5%	73.6%	77.9%	88.8%
4-0	92.4%	78.8%	81.0%	85.9%	88.8%
5-1	62.7%	88.7%	89.4%	96.3%	93.3%
5-2	80.4%	78.5%	97.7%	89.1%	83.6%
6-0	73.2%	82.5%	98.9%	85.1%	93.2%
7-0	81.5%	93.6%	84.7%	87.6%	85.0%
8-1	87.2%	89.5%	91.3%	92.5%	84.5%
8-2	93.5%	85.7%	90.8%	90.2%	95.5%
9-1	90.0%	82.1%	84.6%	89.2%	76.4%
9-2	93.9%	95.1%	91.7%	91.7%	95.4%
9-3	79.0%	85.7%	81.7%	87.7%	81.1%
10-0	81.0%	86.0%	87.7%	79.9%	91.6%
State	**83.0%**	**83.2%**	**82.9%**	**86.7%**	**83.8%**

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

Table 16 reports Varicella coverage rates among the 19 health districts and statewide by study year. Children reported to have had Varicella disease are not considered in the results below. For a more detailed description of Varicella rates including prior history of disease, see Appendix D. The district coverage rates ranged from 44.4 percent to 96.2 percent, with a statewide coverage rate of 77.9 percent for the Varicella vaccine. This is an increase from the 1999-00 Varicella rate of 64.3 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	2001 Rates 1 Varicella
1-1	NA	5.2%	41.5%	45.2%	83.7%
1-2	NA	14.2%	48.0%	58.2%	82.9%
2-0	NA	21.1%	48.4%	81.7%	94.8%
3-1	NA	50.2%	43.2%	66.3%	72.4%
3-2	NA	17.3%	43.1%	67.5%	44.4%
3-3	NA	71.5%	80.6%	52.4%	69.5%
3-4	NA	9.9%	54.2%	89.5%	86.1%
3-5	NA	29.4%	51.0%	57.2%	81.1%
4-0	NA	6.7%	31.7%	65.6%	83.0%
5-1	NA	12.3%	21.2%	61.3%	86.7%
5-2	NA	15.4%	63.7%	61.8%	80.0%
6-0	NA	19.0%	75.3%	61.7%	88.3%
7-0	NA	21.4%	24.1%	53.5%	74.9%
8-1	NA	16.3%	30.4%	61.7%	78.6%
8-2	NA	18.6%	71.8%	66.0%	96.2%
9-1	NA	14.3%	18.9%	51.5%	71.5%
9-2	NA	3.7%	27.3%	58.6%	88.5%
9-3	NA	5.0%	25.7%	57.5%	69.5%
10-0	NA	11.6%	52.0%	58.4%	87.0%
State	NA	**19.0%**	**47.1%**	**64.3%**	**77.9%**

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

Statewide Comparisons of Maternal Demographics of Adequately Immunized Children

Cross-tabulations were performed at the state level in order to describe the relationship between maternal characteristics and the immunization status of two-year-old children. Tables 17-19 provide some of the characteristics of mothers of children who were up-to-date on their 4:3:1 series. Analyses include cross-tabulations of 4:3:1 complete children and total children in each group with the following three variables: maternal race, maternal education, and maternal Medicaid status. Differences between groups are significant if the p-value is less than 0.05.

Table 17 contains statewide cross-tabulations of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals who fall into each category by race and adequacy of immunization. The bottom row represents the percent of each race that falls into that specific category. The table shows that, for all years, the immunization rates of children born to black and white mothers were virtually the same. Maternal race was not a significant factor in the immunization status of two-year-old children in Georgia.

Table 17:
Statewide Crosstabulations of
Maternal Race and Child Immunization Status by Study Year

	1996-97 4:3:1 Adequate	**1997-98 4:3:1 Adequate**	**1998-99 4:3:1 Adequate**	**2001 4:3:1 Adequate**
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	1,500/1,871 (80.2)	1,134/1,572 (72.1)	1654/2265 (73.0)	1265/1661 (76.2)
Black	826/1,042 (79.3)	658/936 (70.3)	806/1122 (71.8)	765/1045 (73.2)
Other	43/57 (75.4)	29/44 (65.9)	51/73 (69.9)	38/49 (77.6)
4:3:1 Total	79.6%	71.3%	73.3%	75.1%

Notes: Total rates based on data weighted by health district.
1996-97 Chi-square = 1.01, p = 0.60; 1998-99 Chi-square=2.61, p=0.45; 1997-98 Chi-square = 1.95, p = 0.58; 1999-00 Analysis not done; 2001 Chi-square=3.15, p=0.21

Table 18 shows the statewide cross-tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group according to the immunization status of their children. The bottom row represents the percent of the total number in that category. In 2001, maternal educational attainment was not associated with child immunization status (Chi-square=2.09, p=0.7).

Table 18:
Statewide Crosstabulations of Maternal Educational Attainment and Child Immunization Status by Study Year

	1996-97 4:3:1 Adequate	**1997-98 4:3:1 Adequate**	**1998-99 4:3:1 Adequate**	**2001 4:3:1 Adequate**
Education	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	152/168 (81.7)	93/123 (75.6)	135/176 (76.7)	161/221 (72.9)
Some high school	463/584 (79.3)	401/569 (70.5)	472/662 (71.3)	456/595 (76.6)
High school	908/1,144 (79.4)	643/916 (70.2)	866/1,189 (72.8)	724/960 (75.4)
Some college	394/535 (73.6)	326/465 (70.1)	493/679 (72.3)	364/485 (75.1)
College or higher	433/493 (87.8)	358/479 (74.7)	545/754 (72.3)	363/494 (73.5)
4:3:1 Total	79.6%	71.3%	73.3%	75.1%

Notes: Total rates based on data weighted by health district. In 1996-97, 28 records did not include Information on educational attainment on the birth certificate. 1996-97 Chi-square = 23.29, p = 0.00; 1997-98 Chi-square = 4.94, p = 0.29; 1998-99 Chi-square=2.12, p=0.71; 1999-00 Analysis not done; 2001 Chi-square=2.09, p=0.7

Table 19 shows the statewide cross-tabulation of maternal Medicaid status and 4:3:1 immunization status for 2001. The 4:3:1 rates are shown for Medicaid recipients and non-Medicaid recipients. In 2001, statewide immunization rates are approximately the same regardless of Medicaid status.

Table 19:
2001 Statewide Crosstabulations
of Maternal Medicaid Status and Child Immunization Status

	2001 4:3:1 Adequate	**2001 4:3:1 Inadequate**
Medicaid Status	#/Total (percent)	#/Total (percent)
Medicaid	1,024/1,357 (75.5)	333/1,357 (24.5)
Non-Medicaid	1,044/1,398 (74.7)	354/1,398 (25.3)
4:3:1 Total	75.1%	24.9%

Notes: 4:3:1 total rates based on data weighted by health district.
2001 Chi-square = 0.23 p = 0.64

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 decreased slightly in 2001 statewide compared to the same rates as measured by this study in 1999-00.

SECTION IV:

RESULTS OF DISTRICT LEVEL ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

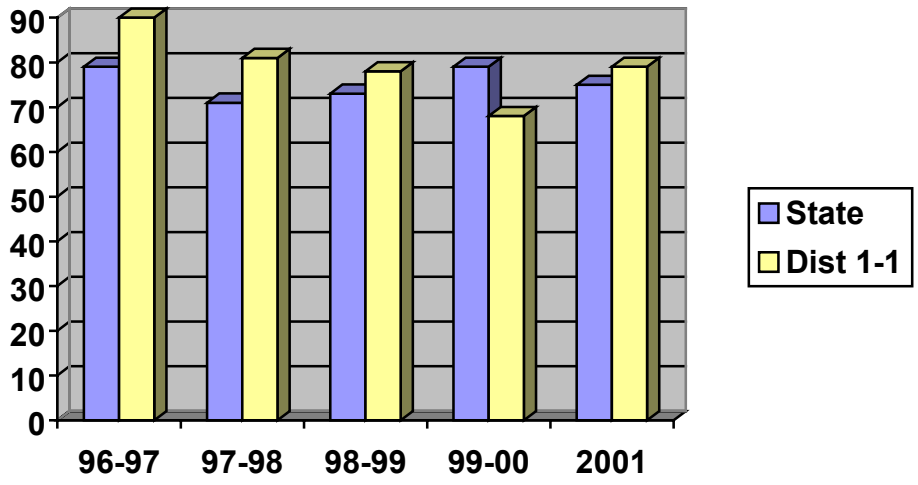
The immunization rates for this fifth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: Response Rates for the 2001 Georgia Immunization Study. The rates reported are based on information collected from both public and private providers. Summaries of all district rates are included in Section III: Statewide Rates, specifically Tables 10-16. The Individual District Reports include immunization rates for each recommended vaccine and 4:3:1 rates. Although statistical analyses would be informative for each of the districts, sub-category sample sizes in the 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 233 children born in January 1999. From the 233 children, 171 records were located (Response Rate=73.4%). Of the 171 located records, there were 5 parental refusals leaving a final sample of 166 records.

- **The 4:3:1 immunization coverage estimate is 78.9 percent (131/166).** This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 68.1 percent (113/166).** This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 20:
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	2001 Adequate Rates
4 DTP/DTaP	90.2%	83.0%	78.2%	67.5%	79.5%
3 OPV/IPV	96.0%	88.1%	90.8%	82.2%	88.6%
1 MMR	95.4%	90.4%	86.6%	73.5%	89.2%
3 Hib	92.5%	88.9%	90.8%	76.5%	89.2%
3 HepB	94.8%	92.6%	88.0%	76.5%	92.8%
1 Varicella*	---	5.2%	41.5%	45.2%	83.7%

*Varicella rates include shots given beyond the 2nd birthday

Table 20 reveals the coverage rates of each vaccine series by the second birthday. With the exception of the Varicella vaccine, coverage rates ranged from 79.5 to 92.8 percent for the 2001 study data. For more information on Varicella rates, see Appendix D.

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

Table 21:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	162	97.6%
DTP2/DTaP2	158	95.2%
DTP3/DTaP3	141	84.9%
DTP4/DTaP4	1	0.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	162	97.6%
OPV/IPV2	158	95.2%
OPV/IPV3	28	16.9%
OPV/IPV4	0	0.0%
MMR1	9	5.4%
MMR2	0	0.0%
HIB1	162	97.6%
HIB2	157	94.6%
HIB3	104	62.7%
HIB4	2	1.2%
HIB5	0	0.0%
HEPB1	162	97.6%
HEPB2	159	95.8%
HEPB3	122	73.5%
HEPB4	1	0.6%
VAR1	4	2.4%
VAR2	0	0.0%

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

Table 22:
Crosstabulations of Maternal Race and
Child Immunization Status for Health District 1-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1: Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	142/159 (89.3)	96/120 (80.0)	99/129 (76.7)	123/154 (79.9)
Black	13/13 (100.0)	11/12 (91.7)	11/12 (91.7)	8/12 (66.7)
Other	1/1 (100.0)	3/3 (2.7)	1/1 (100.0)	----
Total	156/173 (90.2)	110/135 (81.5)	111/142 (78.2)	131/166 (78.9)

* Excludes 1999-00 study year.

Table 22 contains a cross-tabulation of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals in each category. The bottom row in each cell represents the percent in that immunization status category.

- Table 22 shows that in 1996-97, 1997-98, and 1998-99 the 4:3:1 immunization rate of children born to black mothers was higher than that of children born to white mothers in the district. However, in 2001 the immunization rate of children born to white mothers was higher than that of black mothers.

Table 23:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 1-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/16 (87.5)	8/11 (72.7)	9/13 (69.2)	14/15 (93.3)
Some high school	31/37 (83.8)	25/31 (80.6)	23/34 (67.6)	29/41 (70.7)
High school graduate	61/67 (91.0)	42/54 (77.8)	43/52 (82.7)	41/52 (78.8)
Some college	32/35 (91.4)	22/25 (88.0)	23/28 (82.1)	27/35 (77.1)
College or more	16/16 (100.0)	13/14 (92.9)	13/15 (86.7)	20/23 (87.0)
Unknown	2/2 (100.0)	---	---	---
Total	156/193 (90.2)	110/135 (81.5)	111/142 (78.2)	131/166 (78.9)

*Excludes 1999-00 study year.

Table 23 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status in District 1-1. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- A greater percentage of children whose mothers had less than a high school diploma or whose mothers had received an educational attainment of college or more, were adequately immunized as compared to children whose mothers receiving an educational attainment in between these levels.

Table 24:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 1-1

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	62/80 (77.5)
Non-Medicaid	69/86 (80.2)
Total	131/166 (78.9)

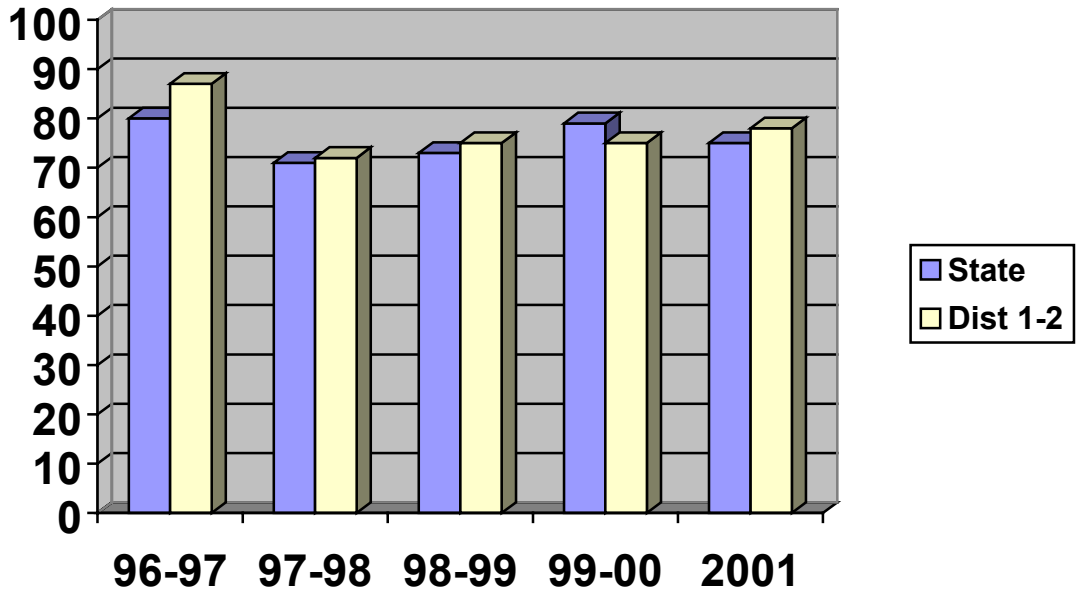
Table 24 shows immunization status of children born to women stratified by Medicaid status. For Health District 1-1, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 1-2

The eligible sample from this district included 202 children born in January 1999. From these children, 155 records were located (Response Rate=76.7%). Of the 155 located records, there were 9 parental refusals leaving a final sample of 146 records.

- **4:3:1 immunization coverage estimate is 78.1 percent (114/146)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **4:3:1+3 immunization coverage estimate 71.2 percent (104/146)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 25:
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	2001 Adequate Rates
4 DTP/DTaP	85.9%	72.6%	75.4%	77.4%	79.5%
3 OPV/IPV	93.7%	88.5%	86.9%	82.2%	86.3%
1 MMR	91.5%	85.8%	84.6%	83.6%	85.6%
3 Hib	80.3%	89.4%	88.0%	86.3%	95.2%
3 HepB	86.6%	85.8%	86.3%	86.3%	93.2%
1 Varicella*	---	14.2%	48.0%	58.2%	82.9%

*Varicella rates include shots given beyond the 2nd birthday

Table 25 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 79.5 to 95.2 percent for the 2001 study data.

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:
2001 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 1-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	143	97.9%
DTP2/DTaP2	140	95.9%
DTP3/DTaP3	127	87.0%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	143	97.9%
OPV/IPV2	141	96.6%
OPV/IPV3	31	21.2%
OPV/IPV4	0	0.0%
MMR1	2	1.4%
MMR2	0	0.0%
HIB1	143	97.9%
HIB2	141	96.6%
HIB3	117	80.1%
HIB4	2	1.4%
HIB5	0	0.0%
HEPB1	144	98.6%
HEPB2	141	96.6%
HEPB3	103	70.5%
HEPB4	0	0.0%
VAR1	5	3.4%
VAR2	0	0.0%

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

Table 27:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 1-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	116/134 (86.6)	79/110 (71.8)	125/167 (74.9)	112/142 (78.9)
Black	6/7 (85.7)	1/2 (50.0)	4/6 (66.7)	2/4 (50.0)
Other	1/1 (100.0)	1/1 (100.0)	2/2 (100.0)	---
Total	123/142 (86.6)	81/113 (71.7)	131/175 (74.9)	114/146 (78.1)

*Excludes 1999-00 study year.

Table 27 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 28:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 1-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	5/8 (62.5)	8/10 (80.0)	12/14 (85.7)	14/20 (70.0)
Some high school	29/33 (87.9)	20/27 (74.1)	29/39 (74.4)	32/37 (86.5)
High school graduate	46/52 (88.5)	31/46 (67.4)	49/65 (75.4)	30/45 (66.7)
Some college	23/25 (92.0)	14/20 (70.0)	18/25 (72.0)	21/23 (91.3)
College or more	20/23 (87.0)	8/10 (80.0)	23/32 (71.9)	17/21 (81.0)
Unknown	---	---	----	---
Total	123/142 (86.6)	81/113 (71.7)	131/175 (74.9)	114/146 (78.1)

*Excludes 1999-00 study year.

Table 28 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 29:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 1-2

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	52/62 (83.9)
Non-Medicaid	62/84 (73.8)
Total	114/146 (78.1)

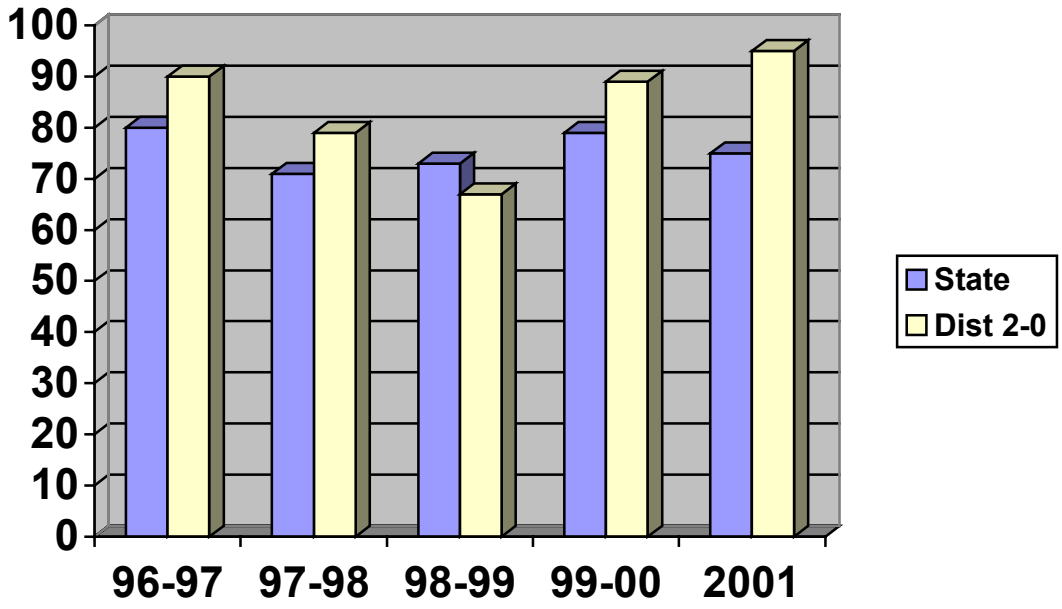
Table 29 shows immunization status of children born to women stratified by Medicaid status. For Health District 1-2, children born to Medicaid women had a slightly higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 2-0

The eligible sample from this district included 199 children born in January 1999. From the 199 children, 136 records were located (Response rate = 68.3%). Of the 136 located records, there was 1 parental refusal leaving a final sample of 135 records.

- **4:3:1 immunization coverage estimate is 94.8 percent (128/135)**. This rate is much higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **4:3:1+3 immunization coverage estimate is 88.9 percent (120/135)**. This rate is also much higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 30:
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	2001 Adequate Rates
4 DTP/DTaP	91.2%	80.3%	67.7%	89.3%	94.8%
3 OPV/IPV	96.7%	93.4%	73.7%	88.5%	97.0%
1 MMR	93.4%	85.5%	72.0%	90.1%	97.0%
3 Hib	96.7%	88.2%	73.1%	88.5%	96.3%
3 HepB	92.8%	88.2%	73.1%	89.3%	95.6%
1 Varicella*	---	21.1%	48.4%	81.7%	94.8%

*Varicella rates include shots given beyond the 2nd birthday

Table 30 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 94.8 to 97.0 percent for the 2001 study data.

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

Table 31:
2001 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 2-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	134	99.3%
DTP2/DTaP2	131	97.0%
DTP3/DTaP3	124	91.9%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	134	99.3%
OPV/IPV2	130	96.3%
OPV/IPV3	43	31.9%
OPV/IPV4	1	0.7%
MMR1	5	3.7%
MMR2	0	0.0%
HIB1	134	99.3%
HIB2	131	97.0%
HIB3	91	67.4%
HIB4	1	0.7%
HIB5	1	0.7%
HEPB1	134	99.3%
HEPB2	131	97.0%
HEPB3	109	80.7%
HEPB4	1	0.7%
VAR1	9	6.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 135

Table 32:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 2-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	154/171 (90.1)	53/69 (76.8)	114/169 (67.5)	121/127 (95.3)
Black	8/9 (88.9)	6/6 (100.0)	9/13 (69.2)	5/6 (83.3)
Other	1/1 (100.0)	1/1 (100.0)	1/4 (25.0)	2/2 (100.0)
Total	163/181 (90.1)	60/76 (78.9)	124/186 (66.7)	128/135 (94.8)

*Excludes 1999-00 study year.

Table 32 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 32 shows that the number of white mothers was over 10 times the number of black mothers in each year of the study for District 2-0. The sample size of black mothers was too small to make definitive generalizations on racial differences in immunization rates.

Table 33:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 2-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	17/18 (94.4)	5/5 (100.0)	17/22 (77.3)	23/25 (92.0)
Some high school	26/26 (100.0)	12/17 (70.6)	24/41 (58.5)	24/24 (100.0)
High school graduate	67/77 (87.0)	25/32 (78.1)	38/58 (65.5)	38/42 (90.5)
Some college	23/29 (79.3)	10/11 (90.9)	21/30 (70.0)	15/16 (93.8)
College or more	26/27 (96.3)	8/11 (72.7)	24/35 (68.6)	28/28 (100.0)
Unknown	4/4 (100.0)	---	---	---
Total	163 (90.1)	60/76 (78.9)	124/186 (66.7)	128/135 (94.8)

*Excludes 1999-00 study year.

Table 33 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 2-0 varied with maternal educational attainment, with no clear trend or correlation emerging.

Table 34:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 2-0

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	48/51 (94.1)
Non-Medicaid	80/84 (95.2)
Total	128/135 (94.8)

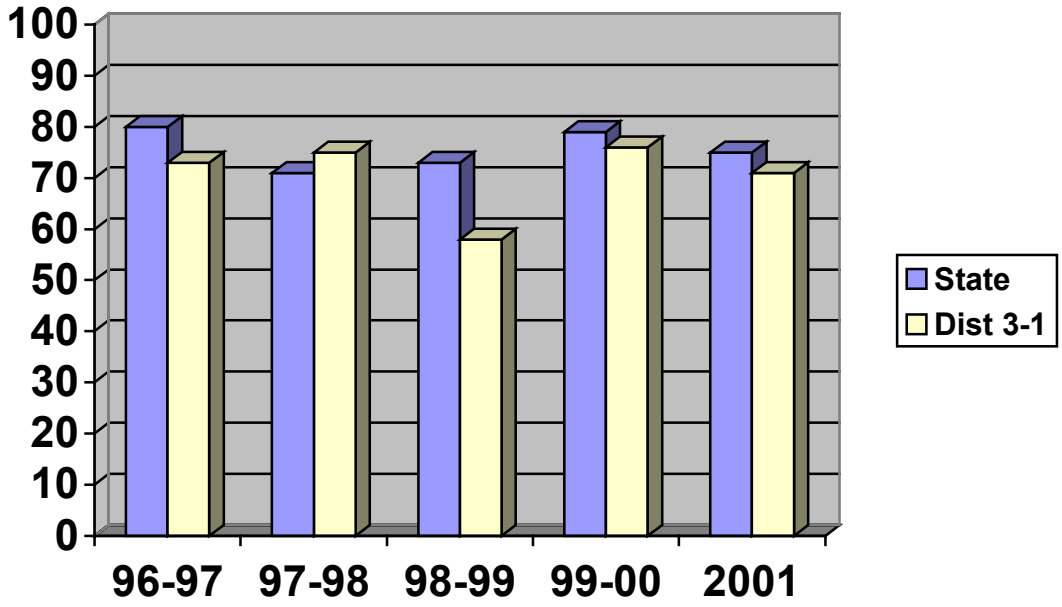
Table 34 shows immunization status of children born to women stratified by Medicaid status. For Health District 2-0, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-1

The eligible sample from this district included 384 children born in January 1999. From the 384 children, 175 records were located (Response Rate=45.6%). Of the 175 located records, there was 1 parental refusal leaving a final sample of 174 records.

- **The 4:3:1 immunization coverage estimate is 70.7 percent (123/174)**. This rate is lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 64.4 percent (112/174)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 35:
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	2001 Adequate Rates
4 DTP/DTaP	73.4%	77.9%	59.0%	77.7%	70.7%
3 OPV/IPV	84.7%	84.4%	72.5%	79.3%	75.3%
1 MMR	77.8%	78.4%	64.0%	81.9%	77.0%
3 Hib	75.4%	83.5%	71.6%	85.0%	83.9%
3 HepB	74.4%	82.3%	72.1%	85.5%	82.8%
1 Varicella*	---	50.2%	43.2%	66.3%	72.4%

*Varicella rates include shots given beyond the 2nd birthday

Table 35 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 70.7 to 83.9 percent for the 2001 study data.

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:
2001 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	165	94.8%
DTP2/DTaP2	157	90.2%
DTP3/DTaP3	142	81.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	165	94.8%
OPV/IPV2	154	88.5%
OPV/IPV3	20	11.5%
OPV/IPV4	0	0.0%
MMR1	5	2.9%
MMR2	0	0.0%
HIB1	165	94.8%
HIB2	155	89.1%
HIB3	123	70.7%
HIB4	2	1.1%
HIB5	0	0.0%
HEPB1	167	96.0%
HEPB2	164	94.3%
HEPB3	109	62.6%
HEPB4	0	0.0%
VAR1	9	5.2%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 174

Table 37:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 3-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	123/168 (73.2)	135/183 (73.8)	101/172 (58.7)	95/128 (74.2)
Black	22/30 (73.3)	36/45 (80.0)	25/45 (55.6)	22/40 (55.0)
Other	3/5 (60.0)	2/2 (100.0)	3/5 (60.0)	6/6 (100.0)
Total	148/203 (72.9)	174/231 (75.3)	129/222 (58.1)	123/174 (70.7)

*Excludes 1999-00 study year.

Table 37 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 37 shows that the number of white mothers in the District 3-1 sample was substantially higher than the number of black mothers in each year of the study. The table also shows no clear relationship between race and immunization status in this district.

Table 38:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 3-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/12 (75.0)	6/9 (66.7)	7/10 (70.0)	7/16 (43.8)
Some high school	15/27 (55.6)	12/18 (66.7)	10/22 (45.5)	17/23 (73.9)
High school graduate	36/56 (64.3)	46/64 (71.9)	32/68 (47.1)	41/53 (77.4)
Some college	25/38 (65.8)	38/51 (74.5)	26/47 (55.3)	22/34 (64.7)
College or more	62/68 (91.2)	72/89 (80.9)	54/75 (72.0)	36/48 (75.0)
Unknown	1/2 (50.0)	---	---	---
Total	148/203 (72.9)	174/231 (75.3)	129/222 (58.1)	123/174 (70.7)

*Excludes 1999-00 study year.

Table 38 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers.

- Immunization status of children in District 3-1 varied with maternal educational attainment, with no clear trend or correlation emerging.

Table 39:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-1

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	39/61 (63.9)
Non-Medicaid	84/113 (74.3)
Total	123/174 (70.4)

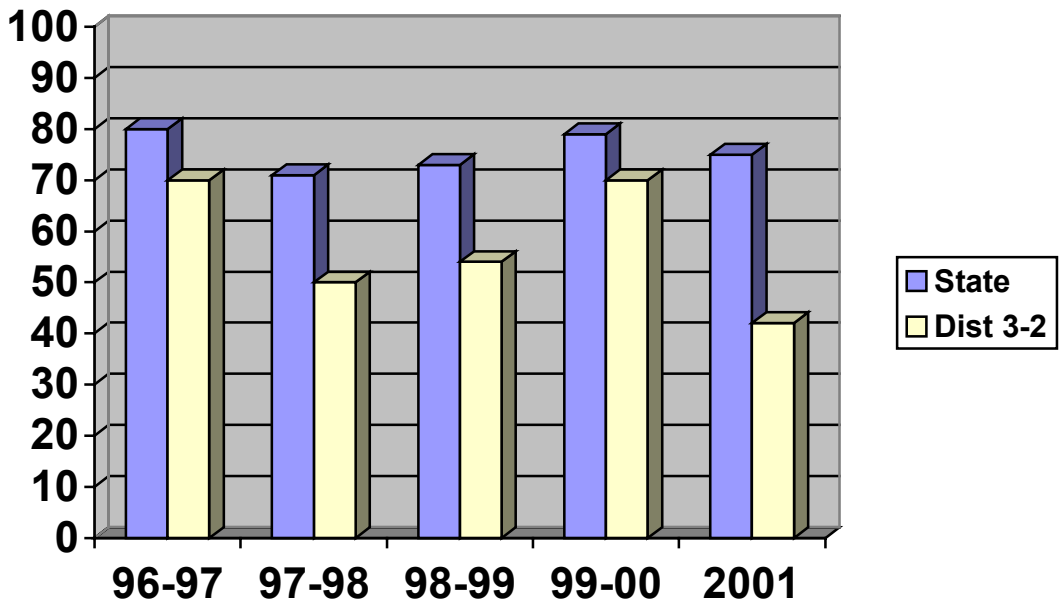
Table 39 shows immunization status of children born to women stratified by Medicaid status. For Health District 3-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-2

The eligible sample from this district included 539 children born in January 1999. From the 539 children, 327 records were located (Response Rate=60.7%). Of the 327 located records, there were 30 parental refusals leaving a final sample of 297 records.

- **The 4:3:1 immunization coverage estimate is 42.4 percent (126/297)**. This rate is much lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 40.4 percent (120/297)**. This rate is much lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 40:
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	2001 Adequate Rates
4 DTP/DTaP	72.1%	51.8%	55.1%	71.1%	42.4%
3 OPV/IPV	83.8%	75.4%	64.9%	76.8%	45.5%
1 MMR	80.4%	71.2%	65.8%	77.8%	45.1%
3 Hib	76.3%	69.1%	65.2%	79.9%	45.5%
3 HepB	78.8%	74.3%	62.8%	79.4%	44.4%
1 Varicella*	---	17.3%	43.1%	67.5%	44.4%

*Varicella rates include shots given beyond the 2nd birthday

Table 40 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 42.4 to 45.5 percent for the 2001 study data.

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

Table 41:
2001 District Immunization Rates by Individual Vaccine at 12 months of age for Health District 3-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	143	48.1%
DTP2/DTaP2	136	45.8%
DTP3/DTaP3	122	41.1%
DTP4/DTaP4	3	1.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	143	48.1%
OPV/IPV2	136	45.8%
OPV/IPV3	67	22.6%
OPV/IPV4	0	0.0%
MMR1	11	3.7%
MMR2	0	0.0%
HIB1	142	47.8%
HIB2	134	45.1%
HIB3	114	38.4%
HIB4	2	0.7%
HIB5	0	0.0%
HEPB1	144	48.5%
HEPB2	133	44.8%
HEPB3	97	32.7%
HEPB4	2	0.7%
VAR1	14	4.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 297

Table 42:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 3-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	59/83 (71.1)	50/78 (64.1)	95/153 (62.1)	66/148 (44.6)
Black	107/154 (69.5)	44/111 (39.6)	77/161 (47.8)	58/143 (40.6)
Other	2/3 (66.7)	1/2 (50.0)	3/11 (27.3)	2/6 (33.3)
Total	168/240 (70.0)	95/191 (49.7)	175/325 (53.8)	126/297 (42.4)

*Excludes 1999-00 study year.

Table 42 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 43:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 3-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	11/14 (78.6)	4/14 (28.6)	10/22 (45.5)	16/30 (53.3)
Some high school	35/58 (60.3)	19/45 (42.2)	23/53 (43.4)	24/47 (51.1)
High school graduate	61/86 (70.9)	28/64 (43.8)	41/77 (53.2)	25/69 (36.2)
Some college	27/40 (67.5)	11/22 (50.0)	32/51 (62.7)	15/37 (40.5)
College or more	33/40 (82.5)	33/26 (71.7)	69/122 (56.6)	46/114 (40.4)
Unknown	1/2 (50.0)	---	---	---
Total	168 (70.0)	95/191 (49.7)	175/325 (53.8)	126/297 42.4)

*Excludes 1999-00 study year.

Table 43 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 44:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-2

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	41/93 (44.1)
Non-Medicaid	85/204 (41.7)
Total	126/297 (42.4)

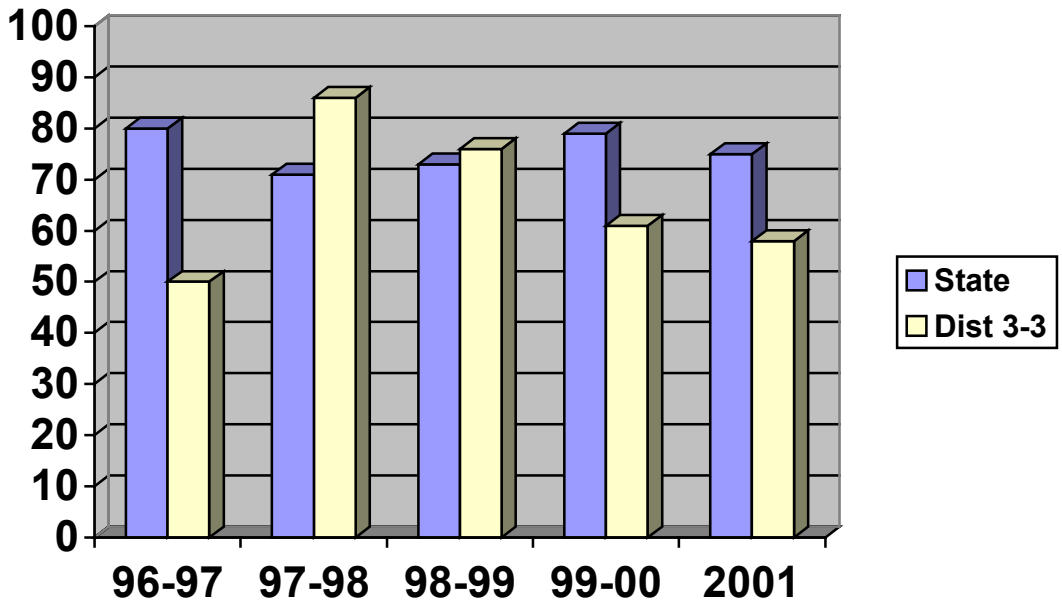
Table 44 shows immunization status of children born to women stratified by Medicaid status. For Health District 3-2, children born to Medicaid women had a slightly higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 3-3

The eligible sample from this district included 282 children born in January 1999. From the 282 children, 118 records were located (Response Rate=41.8%).

- **The 4:3:1 immunization coverage estimate is 57.6 percent (68/118)**. This rate is lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 50.8 percent (60/118)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 45:
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	2001 Adequate Rates
4 DTP/DTaP	69.6%	86.1%	76.3%	63.1%	61.0%
3 OPV/IPV	75.0%	88.5%	93.5%	71.4%	69.5%
1 MMR	54.1%	88.5%	84.9%	70.2%	74.6%
3 Hib	64.9%	87.9%	93.5%	79.8%	81.4%
3 HepB	66.9%	84.8%	92.8%	76.2%	81.4%
1 Varicella*	---	71.5%	80.6%	52.4%	69.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 45 reveals the coverage rates of each vaccine series by the second birthday. Coverage rates ranged from 61.0 to 81.4 percent. 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:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	115	97.5%
DTP2/DTaP2	109	92.4%
DTP3/DTaP3	92	78.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	115	97.5%
OPV/IPV2	105	89.0%
OPV/IPV3	28	23.7%
OPV/IPV4	0	0.0%
MMR1	5	4.2%
MMR2	0	0.0%
HIB1	114	96.6%
HIB2	105	89.0%
HIB3	78	66.1%
HIB4	1	0.8%
HIB5	0	0.0%
HEPB1	113	95.8%
HEPB2	111	94.1%
HEPB3	89	75.4%
HEPB4	0	0.0%
VAR1	8	6.8%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 118

Table 47:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 3-3 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	35/75 (46.7)	70/81 (86.4)	52/71 (73.2)	27/49 (55.1)
Black	32/66 (48.5)	64/77 (83.1)	49/62 (79.0)	39/67 (58.2)
Other	7/7 (100.0)	7/7 (100.0)	5/6 (83.3)	2/2 (100.0)
Total	74/148 (50.0)	141/165 (85.5)	106/139 (76.3)	68/118 (57.6)

*Excludes 1999-00 study year.

Table 47 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization rates of children born to white mothers were similar to that of black mothers in all years of the study in District 3-3.

Table 48:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 3-3 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/7 (57.1)	4/5 (80.0)	4/4 (100.0)	1/4 (25.0)
Some high school	13/23 (56.5)	22/30 (73.3)	21/27 (77.8)	17/31 (54.8)
High school graduate	17/39 (43.6)	53/61 (86.9)	36/51 (70.6)	31/48 (64.6)
Some college	13/16 (81.3)	36/41 (87.8)	27/35 (77.1)	15/26 (57.7)
College or more	---	26/28 (92.9)	18/22 (81.8)	4/9 (44.4)
Unknown	1/5 (20.0)	---	---	---
Total	74/148 (50.0)	141/165 (85.5)	106/139 (76.3)	68/118 (57.6)

*Excludes 1999-00 study year.

Table 48 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 49:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-3

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	42/71 (59.2)
Non-Medicaid	26/47 (55.3)
Total	68/118 (57.6)

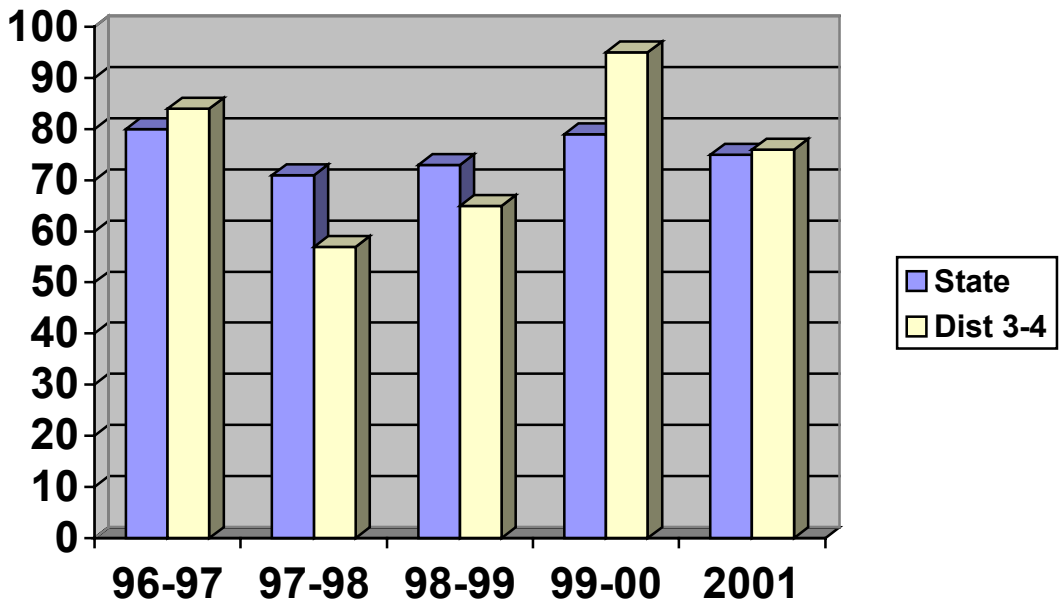
Table 49 shows immunization status of children born to women stratified by Medicaid status. For Health District 3-3, children born to Medicaid women had a slightly higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 3-4

The eligible sample from this district included 100 children born in January 1999. From the 100 children, 81 records were located (Response Rate=81.0%). Of the 81 located records, there were 2 parental refusals leaving a final sample of 79 records.

- **The 4:3:1 immunization coverage estimate is 75.9 percent (60/79)**. This rate is essentially the same as the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 74.7 percent (59/79)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 50:
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	2001 Adequate Rates
4 DTP/DTaP	84.7%	59.4%	66.4%	94.8%	75.9%
3 OPV/IPV	91.7%	64.4%	72.9%	96.4%	77.2%
1 MMR	87.9%	63.4%	69.7%	96.4%	83.5%
3 Hib	80.9%	59.4%	70.4%	97.5%	92.4%
3 HepB	75.2%	62.4%	72.2%	97.5%	86.1%
1 Varicella*	---	9.9%	54.2%	89.5%	86.1%

*Varicella rates include shots given beyond the 2nd birthday

Table 50 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 75.9 to 92.4 percent for the 2001 study data.

Table 51 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. 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 51:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-4

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	76	96.2%
DTP2/DTaP2	73	92.4%
DTP3/DTaP3	69	87.3%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	76	96.2%
OPV/IPV2	73	92.4%
OPV/IPV3	15	19.0%
OPV/IPV4	0	0.0%
MMR1	3	3.8%
MMR2	0	0.0%
HIB1	76	96.2%
HIB2	73	92.4%
HIB3	64	81.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	74	93.7%
HEPB2	73	92.4%
HEPB3	50	63.3%
HEPB4	0	0.0%
VAR1	5	6.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 79

Table 52:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 3-4 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	108/129 (83.7)	45/81 (55.6)	155/241 (64.3)	43/56 (76.8)
Black	19/22 (86.4)	11/16 (68.8)	14/24 (58.3)	12/17 (70.6)
Other	5/6 (83.3)	2/4 (50.0)	11/12 (91.7)	5/6 (83.3)
Total	132/157 (84.1)	58/101 (57.4)	180/277 (65.0)	60/79 (75.9)

*Excludes 1999-00 study year.

Table 52 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 52 shows that in the 1996-97 and 1997-98 study years, the immunization rates of children born to white mothers was less than that of black mothers, but in the 1998-99 and 2001 study years data this trend was reversed.

Table 53:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 3-4 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
Less than high school	2/2 (100.0)	2/3 (66.7)	5/6 (83.3)	2/3 (66.7)
Some high school	13/16 (81.3)	7/12 (58.3)	16/22 (72.7)	7/11 (63.6)
High school graduate	45/56 (80.4)	20/34 (58.8)	47/71 (66.2)	16/25 (64.0)
Some college	30/33 (90.9)	13/18 (72.2)	45/74 (60.8)	8/10 (80.0)
College or more	40/48 (83.3)	16/34 (47.1)	67/104 (66.4)	27/30 (90.0)
Unknown	2/2 (100.0)	---	---	---
Total	132/157 (84.1)	58 (57.4)	180/277 (65.0)	60/79 (75.9)

*Excludes 1999-00 study year.

Table 53 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- In the 2001 study, immunization status of the children in the sample in District 3-4 appears to increase with educational attainment.

Table 54:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-4

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	13/24 (54.2)
Non-Medicaid	47/55 (85.5)
Total	60/79 (75.9)

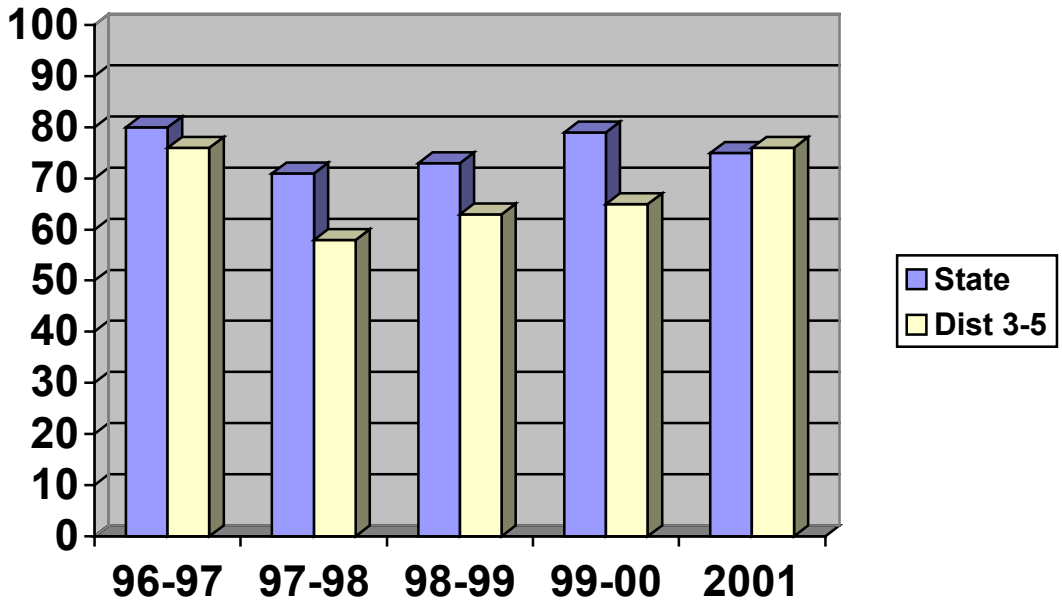
Table 54 shows immunization status of children born to women stratified by Medicaid status. For Health District 3-4, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-5

The eligible sample from this district included 362 children born in January 1999. From the 362 children, 216 records were located (Response Rate=59.7%). Of the 216 located records, there were 20 parental refusals leaving a final sample of 196 records.

- **The 4:3:1 immunization coverage estimate is 75.5 percent (148/196)**. This rate is essentially the same as the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 69.4 percent (136/196)**. This rate is slightly higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 55:
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	2001 Adequate Rates
4 DTP/DTaP	79.2%	61.3%	64.4%	66.2%	77.0%
3 OPV/IPV	89.6%	77.9%	76.4%	75.7%	83.7%
1 MMR	84.6%	68.1%	73.3%	71.6%	87.8%
3 Hib	84.6%	74.8%	76.7%	77.0%	89.3%
3 HepB	83.3%	75.5%	73.6%	77.9%	88.8%
1 Varicella*	---	29.4%	51.0%	57.2%	81.1%

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

Table 55 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 77 to 88.8 percent for the 2001 study data.

Table 56 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 56:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 3-5

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	191	97.4%
DTP2/DTaP2	183	93.4%
DTP3DTaP3	166	84.7%
DTP4/DTaP4	1	0.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	191	97.4%
OPV/IPV2	181	92.3%
OPV/IPV3	42	21.4%
OPV/IPV4	0	0.0%
MMR1	8	4.1%
MMR2	0	0.0%
HIB1	190	96.9%
HIB2	181	92.3%
HIB3	132	67.3%
HIB4	2	1.0%
HIB5	0	0.0%
HEPB1	189	96.4%
HEPB2	182	92.9%
HEPB3	136	69.4%
HEPB4	3	1.5%
VAR1	14	7.1%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 196

Table 57:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 3-5 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
White	73/81 (90.1)	42/54 (77.8)	78/111 (70.3)	38/52 (73.1)
Black	86/127 (67.7)	51/101 (50.5)	94/166 (56.6)	100/130 (76.9)
Other	8/13 (61.5)	0/4 (0.0)	12/15 (80.0)	10/14 (71.4)
Total	167/221 (75.6)	95/163 (58.3)	184/292 (63.0)	148/196 (75.5)

*Excludes 1999-00 study year.

Table 57 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 57 shows that the number of white mothers was less than that of black mothers in each year. The immunization rates of children born to white mothers were greater than that of black mothers for the 1996-97, 1997-98, and 1998-99 study years, but in 2001 the immunization rate of children born to black mothers was slightly higher than that of children born to white mothers.

Table 58:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 3-5 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/20 (70.0)	6/7 (85.7)	8/11 (72.7)	12/17 (70.6)
Some high school	16/24 (66.7)	15/26 (57.7)	19/36 (52.8)	17/25 (68.0)
High school graduate	51/64 (79.7)	26/50 (52.0)	47/84 (56.0)	43/59 (72.9)
Some college	52/57 (91.2)	16/37 (43.2)	30/56 (53.6)	33/46 (71.7)
College or more	---	32/43 (74.4)	80/105 (76.2)	43/49 (87.8)
Unknown	3/3 (100.0)	---	---	---
Total	167/221 (75.6)	95/163 (58.3)	184/292 (63.0)	148/196 (75.5)

*Excludes 1999-00 study year.

Table 58 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- In the 2001 study year, the immunization status of the children in District 3-5 was greatest with the highest level of maternal educational attainment.

Table 59:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 3-5

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	69/98 (70.4)
Non-Medicaid	79/98 (80.6)
Total	148/196 (75.5)

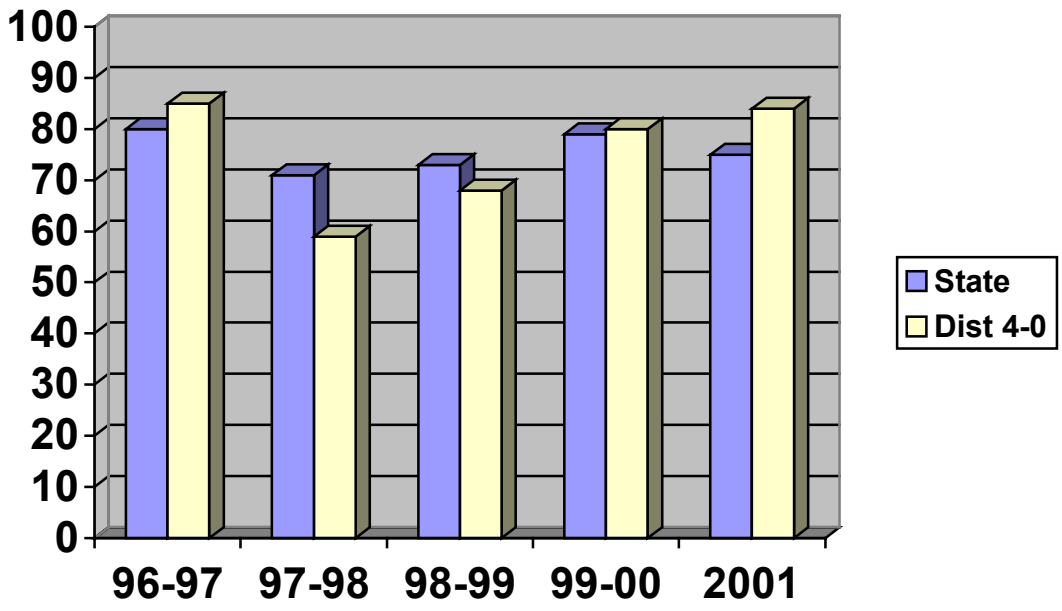
Table 59 shows immunization status of children born to women stratified by Medicaid status. For Health District 3-5, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 4-0

The eligible sample from this district included 266 children born in January 1999. From the 266 children, 209 records were located (Response Rate=78.6%). Of the 209 located records, there were 3 parental refusals leaving a final sample of 206 records.

- **The 4:3:1 immunization coverage estimate is 83.5 percent (172/206)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 75.2 percent (155/206)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 60:
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	2001 Adequate Rates
4 DTP/DTaP	86.1%	61.5%	69.0%	79.7%	83.5%
3 OPV/IPV	93.0%	83.7%	80.2%	85.9%	86.4%
1 MMR	91.1%	69.2%	73.1%	84.9%	86.4%
3 Hib	91.1%	79.8%	81.0%	88.5%	88.3%
3 HepB	92.4%	78.8%	81.0%	85.9%	88.8%
1 Varicella*	---	6.7%	31.7%	65.6%	83.0%

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

Table 60 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 83.5 to 88.8 percent for the 2001 study data. For more information on Varicella rates, see Appendix D.

Table 61 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 61:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	191	92.7%
DTP2/DTaP2	186	90.3%
DTP3/DTaP3	172	83.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	191	92.7%
OPV/IPV2	186	90.3%
OPV/IPV3	37	18.0%
OPV/IPV4	0	0.0%
MMR1	3	1.5%
MMR2	0	0.0%
HIB1	191	92.7%
HIB2	185	89.8%
HIB3	131	63.6%
HIB4	1	0.5%
HIB5	0	0.0%
HEPB1	191	92.7%
HEPB2	190	92.2%
HEPB3	145	70.4%
HEPB4	0	0.0%
VAR1	7	3.4%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 206

Table 62:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 4-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	98/118 (83.1)	36/70 (51.4)	132/203 (65.0)	115/138 (83.3)
Black	36/38 (94.7)	24/33 (72.7)	47/63 (74.6)	54/65 (83.1)
Other	1/2 (50.0)	1/1 (100.0)	2/2 (100)	3/3 (100.0)
Total	135/458 (85.4)	61/104 (58.7)	181/268 (67.5)	172/206 (83.5)

*Excludes 1999-00 study year.

Table 62 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 62 shows that in 2001, the immunization rate of children born to white mothers was essentially the same as that of children born to black mothers.

Table 63:

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

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	16/18 (88.9)	5/5 (100.0)	5/8 (62.5)	4/5 (80.0)
Some high school	24/27 (88.9)	13/25 (52.0)	37/52 (71.2)	43/49 (87.8)
High school graduate	50/59 (84.7)	23/42 (54.8)	75/108 (69.4)	69/84 (82.1)
Some college	22/28 (78.6)	8/14 (57.1)	43/62 (69.3)	32/41 (78.0)
College or more	22/25 (88.0)	12/18 (66.7)	21/38 (55.2)	24/27 (88.9)
Unknown	1/1 (100.0)	---	---	---
Total	135/158 (85.4)	61/104 (58.7)	181/268 (67.5)	172/206 (83.5)

*Excludes 1999-00 study year.

Table 63 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 64:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 4-0

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	85/102 (83.3)
Non-Medicaid	87/104 (83.7)
Total	172/206 (83.5)

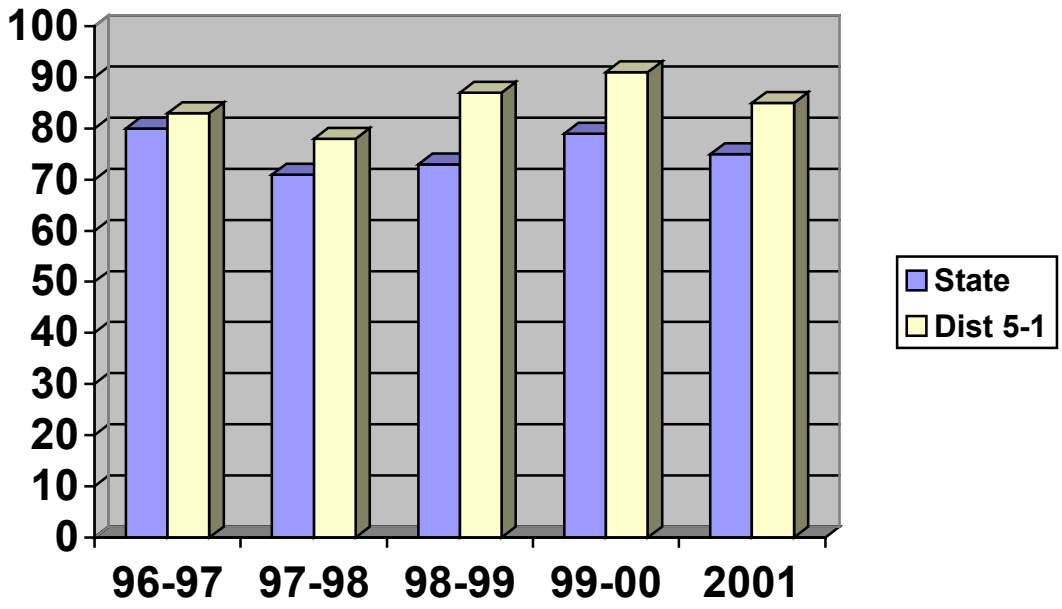
Table 64 shows immunization status of children born to women stratified by Medicaid status. For Health District 4-0, the immunization rate of children born to non-Medicaid women was essentially the same as children born to women using Medicaid.

Individual Health District Report: District 5-1

The eligible sample from this district included 67 children born in January 1999. From the 67 children, 60 records were located (Response Rate=89.6%).

- **The 4:3:1 immunization coverage estimate is 85 percent (51/60)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate 80 percent (48/60)**. This rate is much higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 65:
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	2001 Adequate Rates
4 DTP/DTaP	84.0%	79.2%	87.1%	91.3%	86.7%
3 OPV/IPV	89.3%	90.6%	92.9%	93.8%	93.3%
1 MMR	88.0%	84.0%	91.8%	96.3%	91.7%
3 Hib	84.0%	89.6%	94.1%	96.3%	91.7%
3 HepB	62.7%	88.7%	89.4%	96.3%	93.3%
1 Varicella*	---	12.3%	21.2%	61.3%	86.7%

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

Table 65 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 86.7 to 93.3 percent for the 2001 study data.

Table 66 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 66:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	59	98.3%
DTP2/DTaP2	57	95.0%
DTP3/DTaP3	51	85.0%
DTP4/DTaP4	1	1.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	59	98.3%
OPV/IPV2	57	95.0%
OPV/IPV3	18	30.0%
OPV/IPV4	0	0.0%
MMR1	3	5.0%
MMR2	0	0.0%
HIB1	58	96.7%
HIB2	55	91.7%
HIB3	44	73.3%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	59	98.3%
HEPB2	58	96.7%
HEPB3	48	80.0%
HEPB4	0	0.0%
VAR1	4	6.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 60

Table 67:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 5-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	46/58 (79.3)	55/67 (82.1)	39/45 (86.7)	32/36 (88.9)
Black	16/17 (94.1)	28/39 (71.8)	34/39 (87.2)	19/24 (79.2)
Other	---	---	1/1 (100)	---
Total	62/75 (82.7)	83/106 (78.3)	74/85 (87.1)	51/60 (85.0)

*Excludes 1999-00 study year.

Table 67 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 67 shows that the number of white mothers was greater than that of black mothers. The table also shows that the immunization rates vary in this district in relation to race, with no clear pattern.

Table 68:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 5-1*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	3/3 (100.0)	5/6 (83.3)	2/2 (100.0)	2/2 (100.0)
Some high school	18/22 (81.8)	23/29 (79.3)	19/22 (86.3)	13/19 (68.4)
High school graduate	25/31 (80.6)	33/44 (75.0)	36/42 (85.7)	19/21 (90.5)
Some college	9/12 (75.0)	12/16 (75.0)	8/9 (88.9)	11/12 (91.7)
College or more	6/6 (100.0)	10/11 (90.9)	9/10 (90.0)	6/6 (100.0)
Unknown	1/1 (100.0)	---	---	---
Total	62/75 (82.7)	83/106 (78.3)	74/85 (87.1)	51/60 (85.0)

*Excludes 1999-00 study year.

Table 68 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years of the study, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 69:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 5-1

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	29/35 (82.9)
Non-Medicaid	22/25 (88.0)
Total	51/60 (85.0)

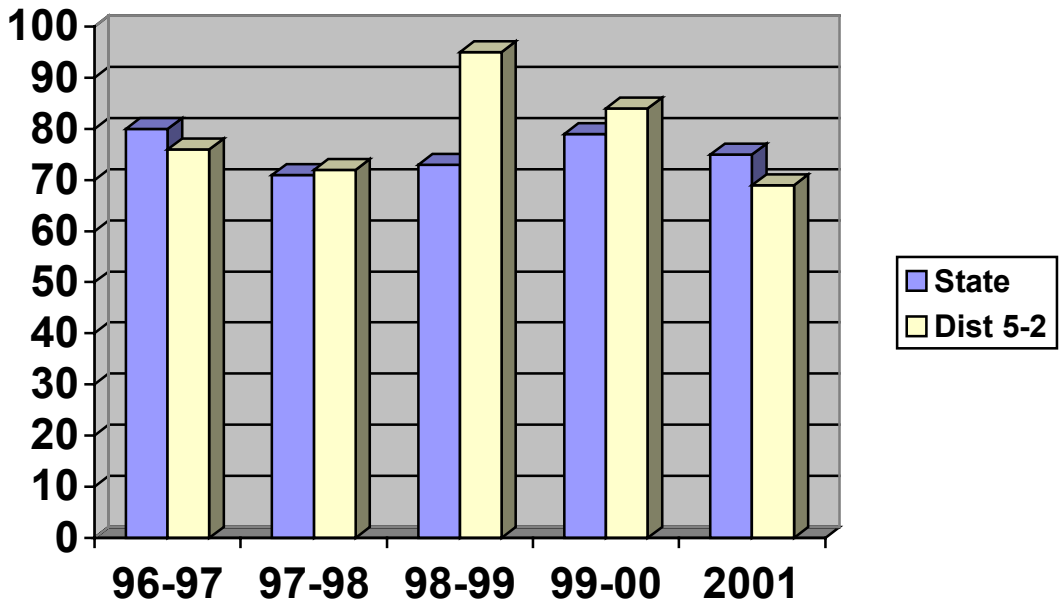
Table 69 shows immunization status of children born to women stratified by Medicaid status. For Health District 5-1, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 5-2

The eligible sample from this district included 188 children born in January 1999. From the 188 children, 111 records were located (Response Rate=59.0%). Of the 111 located records, there was 1 parental refusal leaving a final sample of 110 records.

- **The 4:3:1 immunization coverage estimate is 69.1 percent (76/110)**. This rate is lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 55.5 percent (61/110)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 70:
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	2001 Adequate Rates
4 DTP/DTaP	77.4%	72.5%	96.5%	83.6%	72.7%
3 OPV/IPV	86.9%	85.9%	98.0%	87.3%	81.8%
1 MMR	81.4%	80.5%	95.7%	90.9%	82.7%
3 Hib	85.4%	81.2%	98.0%	96.4%	84.5%
3 HepB	80.4%	78.5%	97.7%	89.1%	83.6%
1 Varicella*	---	15.4%	63.7%	61.8%	80.0%

*Varicella rates include shots given beyond the 2nd birthday

Table 70 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 72.7 to 84.5 percent for the 2001 study data.

Table 71 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 71:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 5-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	103	93.6%
DTP2/DTaP2	102	92.7%
DTP3/DTaP3	92	83.6%
DTP4/DTaP4	1	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	102	92.7%
OPV/IPV2	100	90.9%
OPV/IPV3	18	16.4%
OPV/IPV4	0	0.0%
MMR1	3	2.7%
MMR2	0	0.0%
HIB1	101	91.8%
HIB2	99	90.0%
HIB3	75	68.2%
HIB4	1	0.9%
HIB5	0	0.0%
HEPB1	102	92.7%
HEPB2	100	90.9%
HEPB3	80	72.7%
HEPB4	0	0.0%
VAR1	5	4.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 110

Table 72:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 5-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	74/101 (73.3)	45/69 (65.2)	143/151 (94.7)	33/52 (63.5)
Black	75/95 (78.9)	61/78 (78.2)	97/103 (94.2)	43/58 (74.1)
Other	2/3 (66.7)	1/2 (50.0)	2/2 (100.0)	---
Total	151/199 (75.9)	107/149 (71.8)	242/256 (94.5)	76/110 (69.1)

*Excludes 1999-00 study year.

Table 72 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The table shows that the immunization rate of children born to white mothers was less than that of black mothers in the1996-97, 1997-98, and 2001 study data, but not in the 1998-99 study data.

Table 73:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 5-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/6 (66.7)	6/6 (100.0)	9/10 (90.0)	1/4 (25.0)
Some high school	31/42 (73.8)	31/48 (64.6)	48/51 (94.1)	13/17 (76.5)
High school graduate	62/81 (76.5)	38/50 (76.0)	93/99 (93.9)	41/53 (77.4)
Some college	25/35 (71.4)	16/22 (72.7)	47/50 (94.0)	12/23 (52.2)
College or more	29/35 (82.9)	16/23 (69.6)	45/46 (97.8)	9/13 (69.2)
Total	151/199 (75.9)	107/149 (71.8)	242/256 (94.5)	76/110 (69.1)

*Excludes 1999-00 study year.

Table 73 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 74:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 5-2

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	44/63 (69.8)
Non-Medicaid	32/47 (68.1)
Total	76/110 (69.1)

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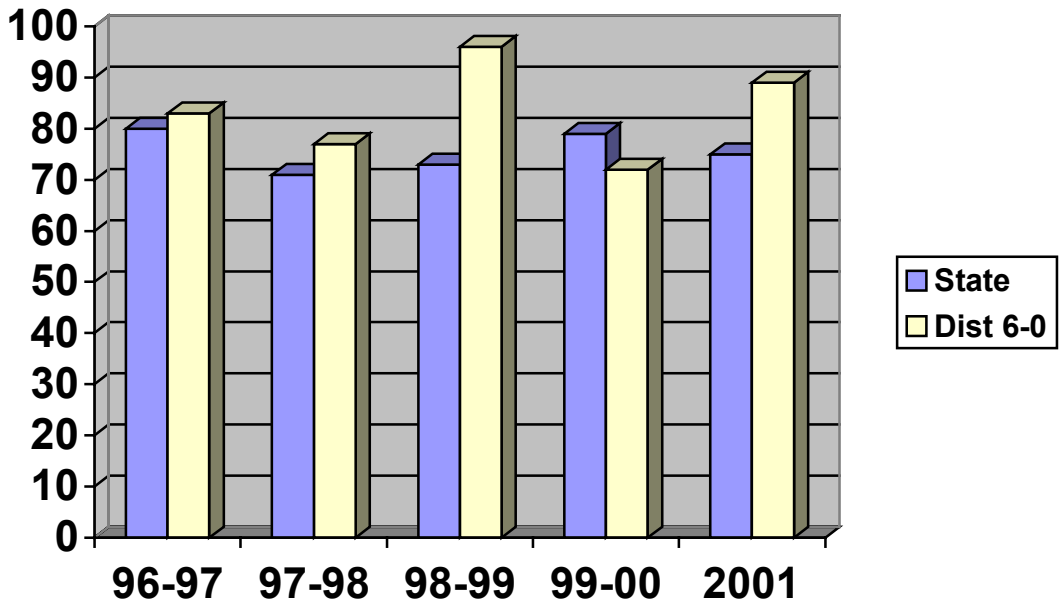
Table 74 shows immunization status of children born to women stratified by Medicaid status. For Health District 5-2, children born to Medicaid women had a slightly higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 6-0

The eligible sample from this district included 180 children born in January 1999. From the 180 children, 162 records were located (Response Rate=90.0%).

- **The 4:3:1 immunization coverage estimate is 88.9 percent (144/162)**. This rate is much higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 72.2 percent (117/162)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 75:
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	2001 Adequate Rates
4 DTP/DTaP	83.9%	76.6%	96.1%	74.5%	89.5%
3 OPV/IPV	91.3%	91.2%	98.3%	85.1%	93.2%
1 MMR	84.6%	84.7%	98.3%	87.2%	95.1%
3 Hib	87.2%	92.0%	98.3%	87.2%	97.5%
3 HepB	73.2%	82.5%	98.9%	85.1%	93.2%
1 Varicella*	---	19.0%	75.3%	61.7%	88.3%

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

Table 75 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 89.5 to 97.5 percent for the 2001 study data. For more information on Varicella rates, see Appendix D.

Table 76 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 76:
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	162	100.0%
DTP2/DTaP2	160	98.8%
DTP3/DTaP3	147	90.7%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	162	100.0%
OPV/IPV2	160	98.8%
OPV/IPV3	43	26.5%
OPV/IPV4	0	0.0%
MMR1	9	5.6%
MMR2	0	0.0%
HIB1	162	100.0%
HIB2	159	98.1%
HIB3	142	87.7%
HIB4	3	1.9%
HIB5	0	0.0%
HEPB1	162	100.0%
HEPB2	161	99.4%
HEPB3	132	81.5%
HEPB4	0	0.0%
VAR1	7	4.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 162

Table 77:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 6-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	65/84 (77.4)	53/70 (75.7)	98/102 (96.0)	57/65 (87.7)
Black	58/64 (90.6)	51/66 (77.3)	71/74 (95.9)	86/96 (89.6)
Other	1/1 (100.0)	1/1 (100.0)	2/2 (100.0)	1/1 (100.0)
Total	124/149 (83.2)	105/137 (76.6)	171/178 (96.1)	144/162 (88.9)

*Excludes 1999-00 study year.

Table 77 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 77 shows that the immunization rates of children born to white mothers were similar to that of black mothers in the 1997-98, 1998-99, and 2001 study years.

Table 78:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 6-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	5/7 (71.4)	4/4 (100.0)	4/4 (100.0)	10/12 (83.3)
Some high school	26/30 (86.7)	28/38 (73.7)	36/37 (97.3)	32/38 (84.2)
High school graduate	50/63 (79.4)	37/43 (86.0)	65/69 (94.2)	47/52 (90.4)
Some college	24/27 (88.9)	19/30 (63.3)	43/44 (97.7)	34/35 (97.1)
College or more	17/20 (85.0)	17/22 (77.3)	23/24 (95.8)	21/25 (84.0)
Total	124/147 (83.2)	105/137 (76.6)	171/178 (96.1)	144/162 (88.9)

*Excludes 1999-00 study years.

Table 78 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 79:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 6-0

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	83/93 (89.2)
Non-Medicaid	61/69 (88.4)
Total	144/162 (88.9)

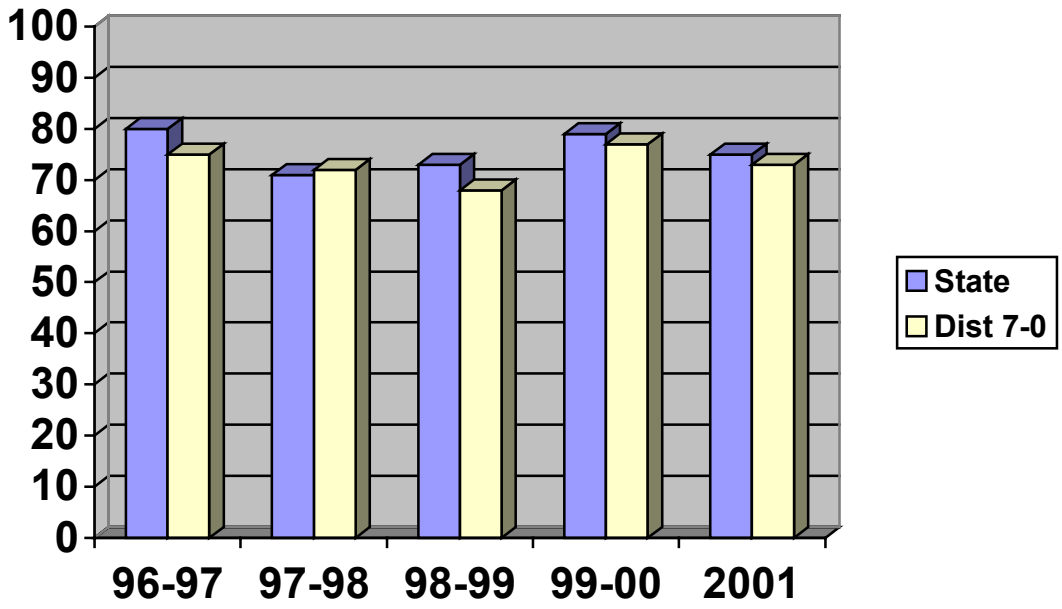
Table 79 shows immunization status of children born to women stratified by Medicaid status. For Health District 6-0, children born to Medicaid women had a slightly higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 7-0

The eligible sample from this district included 210 children born in January 1999. From the 210 children, 170 records were located (Response Rate=81.0%). Of the 170 located records, there were 3 parental refusals leaving a final sample of 167 records.

- **The 4:3:1 immunization coverage estimate is 73.1 percent (122/167)**. This rate is lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 59.9 percent (100/167)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 80:
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	2001 Adequate Rates
4 DTP/DTaP	78.2%	73.1%	69.3%	77.1%	74.3%
3 OPV/IPV	88.2%	93.2%	83.2%	85.9%	78.4%
1 MMR	83.2%	92.3%	83.2%	85.3%	80.2%
3 Hib	72.3%	88.5%	85.4%	85.3%	82.6%
3 HepB	81.5%	93.6%	84.7%	87.6%	85.0%
1 Varicella*	---	21.4%	24.1%	53.5%	74.9%

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

Table 80 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 74.3 to 85.0 percent for the 2001 study data.

Table 81 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 81:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 7-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	150	89.8%
DTP2/DTaP2	149	89.2%
DTP3/DTaP3	138	82.6%
DTP4/DTaP4	1	0.6%
DTP5/DTaP5	0	0.0%
OPV/IPV1	149	89.2%
OPV/IPV2	148	88.6%
OPV/IPV3	34	20.4%
OPV/IPV4	0	0.0%
MMR1	1	0.6%
MMR2	0	0.0%
HIB1	146	87.4%
HIB2	145	86.8%
HIB3	86	51.5%
HIB4	1	0.6%
HIB5	0	0.0%
HEPB1	149	89.2%
HEPB2	148	88.6%
HEPB3	117	70.1%
HEPB4	2	1.2%
VAR1	1	0.6%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 167

Table 82:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 7-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	39/56 (69.6)	81/109 (74.3)	46/61 (75.4)	43/64 (67.2)
Black	49/61 (80.3)	85/120 (70.8)	45/73 (61.6)	78/101 (77.2)
Other	1/2 (50.0)	2/5 (40.0)	2/3 (66.7)	1/2 (50.0)
Total	89/119 (74.8)	168/234 (71.8)	93/137 (67.9)	122/167 (73.1)

*Excludes 1999-00 study year.

Table 82 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 82 shows that the immunization rate of children born to black mothers was greater than white mothers in the 2001 study data.

Table 83:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 7-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/4 (100.0)	5/7 (71.4)	8/10 (80.0)	4/6 (66.7)
Some high school	26/31 (83.9)	39/56 (69.6)	14/24 (58.3)	41/53 (77.4)
High school graduate	38/53 (71.7)	69/90 (76.7)	36/58 (62.1)	55/72 (76.4)
Some college	11/16 (68.8)	25/43 (58.1)	21/29 (72.4)	10/13 (76.9)
College or more	10/15 (66.7)	30/38 (78.9)	14/16 (87.5)	12/23 (52.2)
Total	89/119 (74.8)	168/234 (71.8)	93/137 (67.9)	122/167 (73.1)

*Excludes 1999-00 study data.

Table 83 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- In the 2001 study year, the immunization status of the children in District 7-0 does not appears to increase with increased maternal education.

Table 84:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 7-0

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	79/104 (76.0)
Non-Medicaid	43/63 (68.3)
Total	122/167 (73.1)

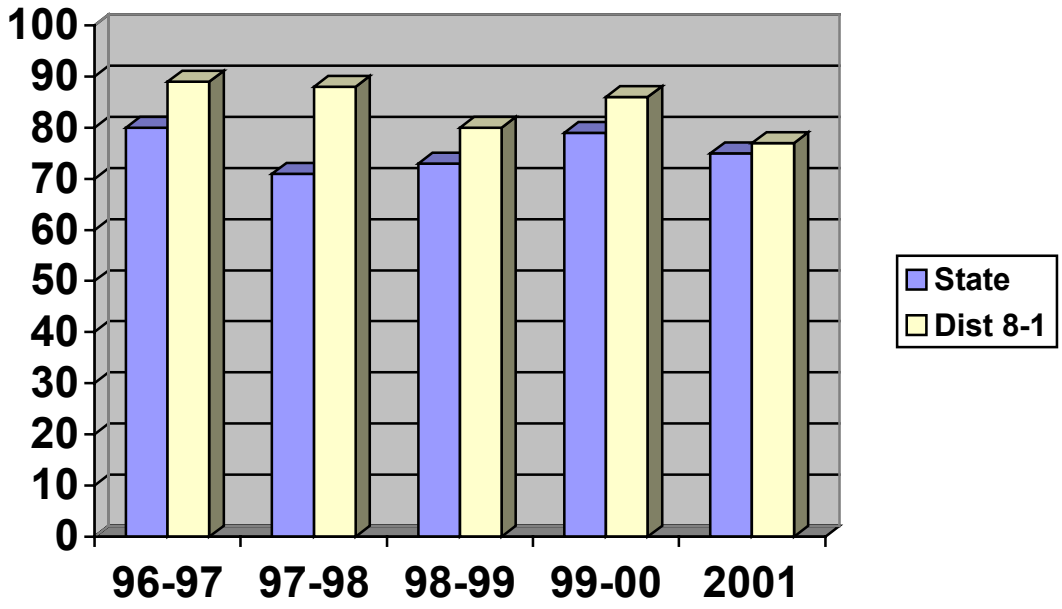
Table 84 shows immunization status of children born to women stratified by Medicaid status. For Health District 7-0, children born to Medicaid women had a higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 8-1

The eligible sample from this district included 114 children born in January 1999. From the 114 children, 104 records were located (Response Rate=91.2%). Of the 104 located records, there was 1 parental refusal leaving a final sample of 103 records.

- **The 4:3:1 immunization coverage estimate is 76.7 percent (79/103)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 66 percent (68/103)**. This rate is slightly lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 85:
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	2001 Adequate Rates
4 DTP/DTaP	90.4%	88.4%	81.5%	86.9%	77.7%
3 OPV/IPV	97.6%	94.2%	94.6%	87.9%	84.5%
1 MMR	91.2%	95.3%	89.1%	90.7%	82.5%
3 Hib	96.8%	96.5%	94.6%	92.5%	81.6%
3 HepB	87.2%	89.5%	91.3%	92.5%	84.5%
1 Varicella*	---	16.3%	30.4%	61.7%	78.6%

*Varicella rates include shots given beyond the 2nd birthday

Table 85 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 77.7 to 84.5 percent for the 2001 study data.

Table 86 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 86:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	91	88.3%
DTP2/DTaP2	90	87.4%
DTP3/DTaP3	83	80.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	91	88.3%
OPV/IPV2	90	87.4%
OPV/IPV3	21	20.4%
OPV/IPV4	0	0.0%
MMR1	2	1.9%
MMR2	0	0.0%
HIB1	90	87.4%
HIB2	86	83.5%
HIB3	47	45.6%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	92	89.3%
HEPB2	90	87.4%
HEPB3	70	68.0%
HEPB4	3	2.9%
VAR1	3	2.9%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 103

Table 87:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 8-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	70/80 (87.5)	41/49 (83.7)	46/56 (82.1)	42/60 (70.0)
Black	40/44 (90.9)	34/36 (94.4)	28/35 (80.0)	36/42 (85.7)
Other	1/1 (100.0)	1/1 (100.0)	0/1 (0.0)	1/1 (100.0)
Total	111/125 (88.8)	76/86 (88.4)	74/92 (80.4)	79/103 (76.7)

*Excludes 1999-00 study year.

Table 87 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 87 shows that the number of white mothers was more than that of black mothers. The table also shows that the immunization rates of children born to white mothers was less than that of children born to black mothers in the 2001 study data.

Table 88:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 8-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/9 (77.8)	2/2 (100.0)	7/8 (87.5)	9/13 (69.2)
Some high school	28/29 (96.6)	23/27 (85.2)	21/31 (67.7)	19/26 (73.1)
High school graduate	42/49 (85.7)	26/28 (92.9)	24/27 (88.9)	27/34 (79.4)
Some college	16/19 (84.2)	13/16 (81.3)	12/15 (80.0)	17/22 (77.3)
College or more	18/19 (94.7)	12/13 (92.3)	10/11 (90.9)	7/8 (87.5)
Total	111/125 (88.8)	76/86 (88.4)	74/92 (80.4)	79/103 (76.7)

*Excludes 1999-00 study year.

Table 88 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 89:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 8-1

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	50/68 (73.5)
Non-Medicaid	29/35 (82.9)
Total	79/103 (76.7)

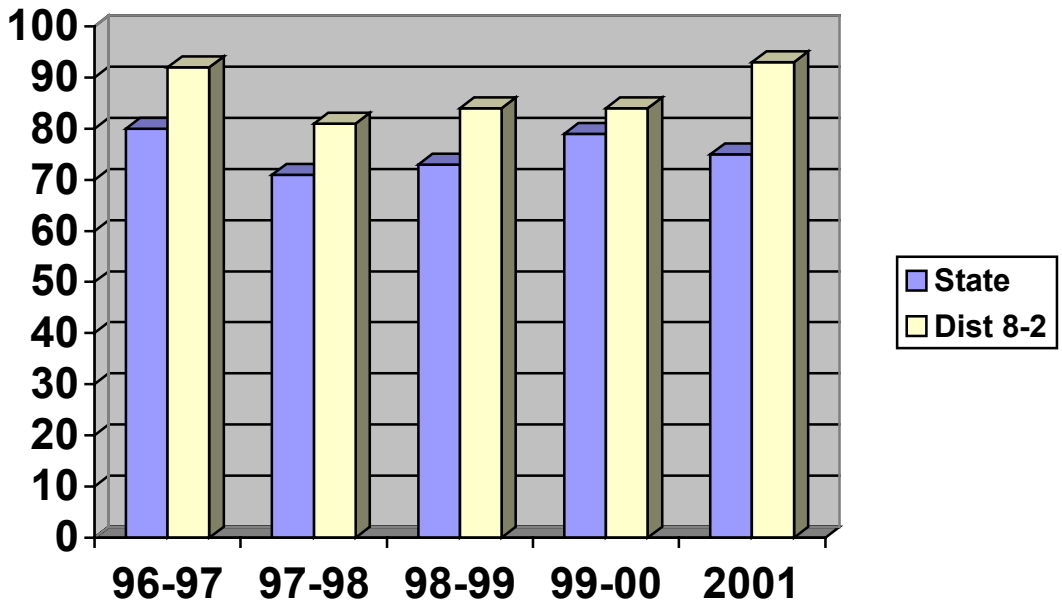
Table 89 shows immunization status of children born to women stratified by Medicaid status. For Health District 8-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 8-2

The eligible sample from this district included 149 children born in January 1999. From the 149 children, 133 records were located (Response Rate=89.3%).

- **The 4:3:1 immunization coverage estimate is 93.2 percent (124/133)**. This rate is much higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate rate is 86.5 percent (115/133)**. This rate is much higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 90:
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	2001 Adequate Rates
4 DTP/DTaP	94.6%	81.4%	84.5%	85.6%	94.7%
3 OPV/IPV	97.3%	88.6%	90.1%	90.8%	96.2%
1 MMR	94.6%	85.7%	91.5%	88.9%	97.0%
3 Hib	85.5%	87.1%	90.8%	92.8%	92.5%
3 HepB	93.5%	85.7%	90.8%	90.2%	95.5%
1 Varicella*	---	18.6%	71.8%	66.0%	96.2%

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

Table 90 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 92.5 to 97.0 percent for the 2001 study data.

Table 91 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 91:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	132	99.2%
DTP2/DTaP2	128	96.2%
DTP3/DTaP3	122	91.7%
DTP4/DTaP4	3	2.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	132	99.2%
OPV/IPV2	128	96.2%
OPV/IPV3	40	30.1%
OPV/IPV4	0	0.0%
MMR1	7	5.3%
MMR2	0	0.0%
HIB1	131	98.5%
HIB2	127	95.5%
HIB3	72	54.1%
HIB4	2	1.5%
HIB5	0	0.0%
HEPB1	132	99.2%
HEPB2	129	97.0%
HEPB3	108	81.2%
HEPB4	1	0.8%
VAR1	10	7.5%
VAR2	0	0.0%

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

Table 92:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 8-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	75/80 (93.8)	31/40 (77.5)	56/71 (78.9)	55/58 (94.8)
Black	93/103 (90.3)	26/30 (86.7)	62/70 (88.6)	67/73 (91.8)
Other	3/3 (100.0)	---	1/1 (100.0)	2/2 (100.0)
Total	171/186 (91.9)	57/70 (81.4)	119/142 (83.8)	124/133 (93.2)

*Excludes 1999-00 study year.

Table 92 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 92 shows that the immunization rates of children born to white mothers was slightly higher than that of black mothers in the 2001 study.

Table 93:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 8-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/13 (92.3)	7/9 (77.8)	9/11 (81.8)	9/9 (100.0)
Some high school	56/59 (94.9)	17/19 (89.5)	41/48 (85.4)	39/44 (88.6)
High school graduate	75/84 (89.3)	18/25 (72.0)	41/47 (87.2)	44/48 (91.7)
Some college	17/19 (89.5)	10/10 (100.0)	18/23 (78.2)	22/22 (100.0)
College or more	11/11 (100.0)	5/7 (71.4)	10/13 (76.9)	10/10 (100.0)
Total	171/186 (91.9)	57/70 (81.4)	119/142 (83.8)	124/133 (93.2)

*Excludes 1999-00 study year.

Table 93 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 94:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 8-2

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	82/90 (91.1)
Non-Medicaid	42/43 (97.7)
Total	124/133 (93.2)

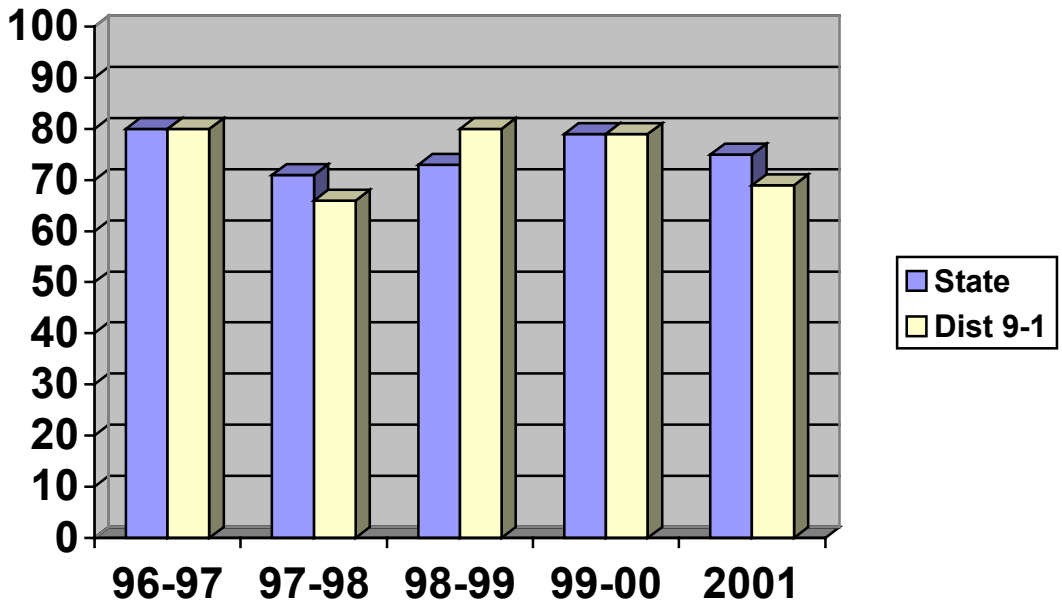
Table 94 shows immunization status of children born to women stratified by Medicaid status. For Health District 8-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 9-1

The eligible sample from this district included 145 children born in January 1999. From the 145 children, 124 records were located (Response Rate=85.5%). Of the 124 located records, there was 1 parental refusal leaving a final sample of 123 records.

- **The 4:3:1 immunization coverage estimate is 69.1 percent (85/123)**. This rate is lower to the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 53.7 percent (66/123)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 95:
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	2001 Adequate Rates
4 DTP/DTaP	79.3%	67.1%	80.4%	80.8%	69.9%
3 OPV/IPV	93.3%	80.7%	87.4%	88.5%	79.7%
1 MMR	90.7%	72.1%	86.7%	85.4%	79.7%
3 Hib	93.3%	81.4%	86.0%	91.5%	81.3%
3 HepB	90.0%	82.1%	84.6%	89.2%	76.4%
1 Varicella*	---	14.3%	18.8%	51.5%	71.5%

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

Table 95 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 69.9 to 81.3 percent for the 2001 study data.

Table 96 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 96:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	120	97.6%
DTP2/DTaP2	109	88.6%
DTP3/DTaP3	96	78.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	119	96.7%
OPV/IPV2	109	88.6%
OPV/IPV3	43	35.0%
OPV/IPV4	0	0.0%
MMR1	3	2.4%
MMR2	0	0.0%
HIB1	119	96.7%
HIB2	109	88.6%
HIB3	86	69.9%
HIB4	3	2.4%
HIB5	0	0.0%
HEPB1	122	99.2%
HEPB2	119	96.7%
HEPB3	80	65.0%
HEPB4	1	0.8%
VAR1	1	0.8%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 123

Table 97:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 9-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	51/72 (70.8)	38/70 (54.3)	47/66 (71.2)	36/55 (65.5)
Black	68/77 (88.3)	53/66 (80.3)	68/77 (88.3)	47/66 (71.2)
Other	1/1 (100.0)	2/4 (50.0)	---	2/2 (100.0)
Total	120/150 (80.0)	93/140 (66.4)	115/143 (80.4)	85/123 (69.1)

*Excludes 1999-00 study year.

Table 97 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 97 shows that the immunization rates of children born to white mothers was less than that of black mothers in each of the years of the study.

Table 98:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 9-1 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	10/11 (90.9)	4/5 (80.0)	8/8 (100.0)	0/2 (0.0)
Some high school	19/24 (79.2)	28/37 (75.7)	31/37 (83.7)	18/22 (81.8)
High school graduate	46/57 (80.7)	28/45 (62.2)	40/49 (81.6)	38/58 (65.5)
Some college	22/29 (75.9)	22/30 (73.3)	19/26 (73.0)	11/22 (50.0)
College or more	23/28 (82.1)	11/23 (47.8)	17/23 (73.9)	18/19 (94.7)
Unknown	0/1 (0.0)	---	---	---
Total	120/150 (80.0)	93/140 (66.4)	115/143 (80.4)	85/123 (69.1)

*Excludes 1999-00 study year.

Table 98 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 99:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-1

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	43/64 (67.2)
Non-Medicaid	42/59 (71.2)
Total	85/123 (69.1)

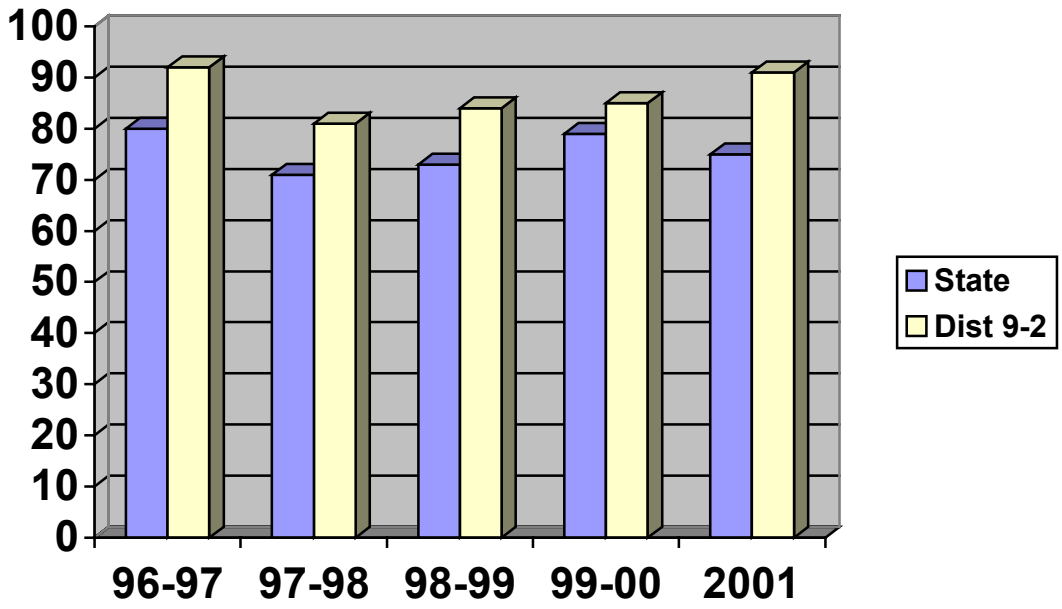
Table 99 shows immunization status of children born to women stratified by Medicaid status. For Health District 9-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 9-2

The eligible sample from this district included 135 children born in January 1999. From the 135 children, 131 records were located (Response Rate=97.0%).

- **The 4:3:1 immunization coverage estimate is 90.8 percent (119/131)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 80.2 percent (105/131)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 100:
District Immunization Rates at 2 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	2001 Adequate Rates
4 DTP/DTaP	91.3%	84.1%	83.5%	88.0%	92.4%
3 OPV/IPV	95.7%	92.7%	93.4%	90.2%	92.4%
1 MMR	93.0%	87.8%	85.1%	91.0%	93.1%
3 Hib	92.2%	93.9%	93.4%	95.5%	95.4%
3 HepB	93.9%	95.1%	91.7%	91.7%	95.4%
1 Varicella*	---	3.7%	27.3%	58.6%	88.5%

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

Table 100 reveals the coverage rates of each vaccine series by the second birthday. With the exception of the Varicella vaccine, coverage rates ranged from 92.4 to 95.4 percent for the 2001 study data. For more information on Varicella rates, see Appendix D.

Table 101 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 101:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	130	99.2%
DTP2/DTaP2	128	97.7%
DTP3/DTaP3	114	87.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	130	99.2%
OPV/IPV2	128	97.7%
OPV/IPV3	10	7.6%
OPV/IPV4	0	0.0%
MMR1	1	0.8%
MMR2	0	0.0%
HIB1	129	98.5%
HIB2	127	96.9%
HIB3	63	48.1%
HIB4	2	1.5%
HIB5	0	0.0%
HEPB1	131	100.0%
HEPB2	128	97.7%
HEPB3	64	48.9%
HEPB4	0	0.0%
VAR1	7	5.3%
VAR2	0	0.0%

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

Table 102:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 9-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent	#/Total (percent
White	75/83 (90.4)	53/65 (81.5)	81/96 (84.3)	82/92 (89.1)
Black	31/32 (96.9)	13/17 (76.5)	20/25 (80.0)	36/38 (94.7)
Other	---	---	---	1/1 (100.0)
Total	106/115 (92.2)	66/82 (80.5)	101/121 (83.5)	119/131 (90.8)

*Excludes 1999-00 study year.

Table 102 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 102 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rates of children born to white mothers was similar to that of black mothers.

Table 103:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 9-2 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	6/7 (85.7)	4/5 (80.0)	7/8 (87.5)	12/12 (100.0)
Some high school	18/21 (85.7)	15/19 (78.9)	18/23 (78.3)	28/33 (84.8)
High school graduate	50/51 (98.0)	32/37 (86.5)	44/51 (86.3)	48/55 (87.3)
Some college	19/22 (86.4)	8/14 (57.1)	15/17 (88.2)	21/21 (100.0)
College or more	13/14 (92.9)	7/7 (100.0)	17/22 (77.3)	10/10 (100.0)
Total	106/115 (92.2)	66/82 (80.5)	101/121 (83.5)	119/131 (90.8)

*Excludes 1999-00 study year.

Table 103 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 9-2 varied with educational attainment.

Table 104:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-2

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	68/76 (89.5)
Non-Medicaid	51/55 (92.7)
Total	119/131 (90.8)

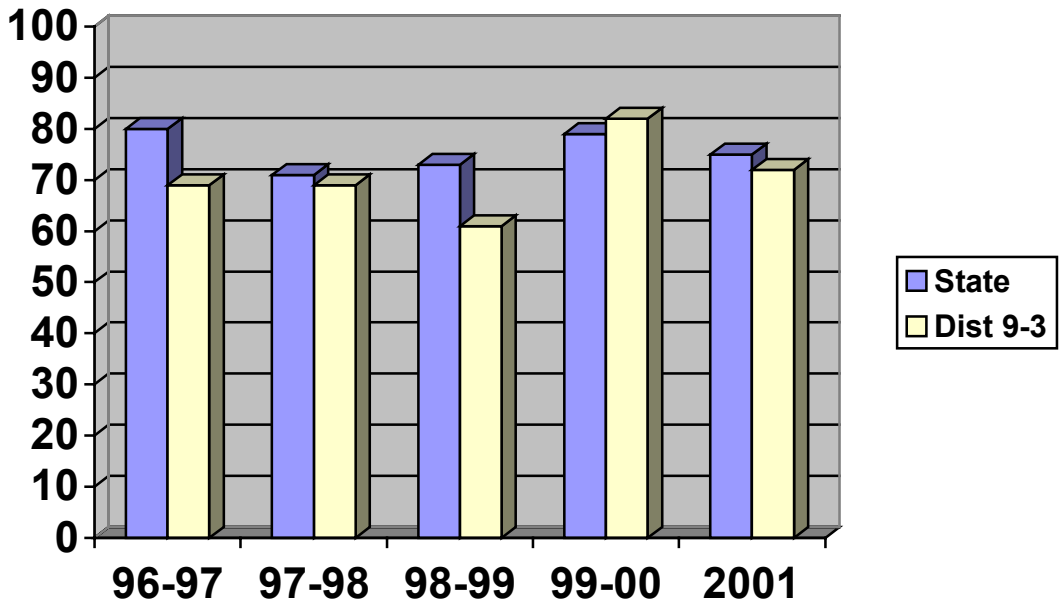
Table 104 shows immunization status of children born to women stratified by Medicaid status. For Health District 9-2, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 9-3

The eligible sample from this district included 129 children born in January 1999. From the 129 children, 96 records were located (Response Rate=74.4%). Of the 96 located records, there was 1 parental refusal leaving a final sample of 95 records.

- **The 4:3:1 immunization coverage estimate is 71.6 percent (68/95)**. This rate is lower than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 61.1 percent (58/95)**. This rate is lower than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 105:
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	2001 Adequate Rates
4 DTP/DTaP	72.6%	72.1%	64.2%	82.2%	71.6%
3 OPV/IPV	85.5%	94.3%	77.1%	86.3%	76.8%
1 MMR	78.2%	76.4%	67.9%	87.7%	80.0%
3 Hib	83.9%	85.7%	78.0%	89.0%	81.1%
3 HepB	79.0%	85.7%	81.7%	87.7%	81.1%
1 Varicella*	---	5.0%	25.7%	57.5%	69.5%

*Varicella rates include shots given beyond the 2nd birthday

Table 105 reveals the coverage rates of each vaccine series by the second birthday. With the exception of Varicella vaccine coverage rates ranged from 71.6 to 81.1 percent for the 2001 study data. For more information on Varicella rates, see Appendix D.

Table 106 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 106:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 9-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	88	92.6%
DTP2/DTaP2	81	85.3%
DTP3/DTaP3	77	81.1%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	89	93.7%
OPV/IPV2	81	85.3%
OPV/IPV3	18	18.9%
OPV/IPV4	0	0.0%
MMR1	3	3.2%
MMR2	0	0.0%
HIB1	87	91.6%
HIB2	80	84.2%
HIB3	58	61.1%
HIB4	1	1.1%
HIB5	0	0.0%
HEPB1	90	94.7%
HEPB2	83	87.4%
HEPB3	60	63.2%
HEPB4	0	0.0%
VAR1	2	2.1%
VAR2	0	0.0%

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

Table 107:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 9-3 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	45/72 (62.5)	58/89 (65.2)	38/60 (63.3)	47/67 (70.1)
Black	40/51 (78.4)	38/51 (74.5)	26/46 (56.5)	21/28 (75.0)
Other	1/1 (100.0)	---	2/3 (66.6)	---
Total	86/124 (69.4)	96/140 (68.6)	66/109 (60.6)	68/95 (71.6)

*Excludes 1999-00 study year.

Table 107 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 107 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rates of children born to white mothers was less than that of black mothers in all years, except for the 1998-99 study year.

Table 108:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 9-3 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/6 (66.7)	1/2 (50.0)	2/2 (100.0)	7/8 (87.5)
Some high school	19/32 (59.4)	26/32 (81.3)	17/30 (56.7)	15/23 (65.2)
High school graduate	40/51 (78.4)	34/58 (58.6)	29/47 (61.7)	23/31 (74.2)
Some college	16/28 (57.1)	20/26 (76.9)	12/19 (63.1)	15/21 (71.4)
College or more	7/7 (100.0)	15/22 (68.2)	6/11 (54.5)	8/12 (66.7)
Total	86 (69.4)	96/140 (68.6)	66/109 (60.6)	68/95 (71.6)

*Excludes 1999-00 study year.

Table 108 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

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

Table 109:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 9-3

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	38/53 (71.7)
Non-Medicaid	30/42 (71.4)
Total	68/95 (71.6)

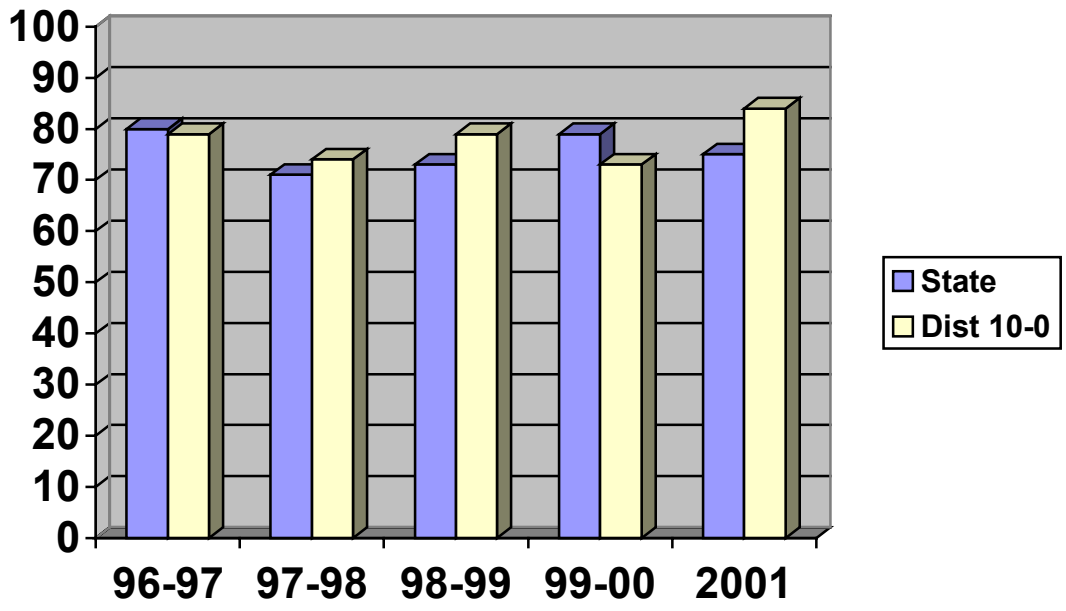
Table 109 shows immunization status of children born to women stratified by Medicaid status. For Health District 9-3, children born to non-Medicaid women had essentially the same immunization rate as children born to women using Medicaid.

Individual Health District Report: District 10-0

The eligible sample from this district included 177 children born in January 1999. From the 177 children, 157 records were located (Response Rate=88.7%). Of the 157 located records, there were 3 parental refusals leaving a final sample of 154 records.

- **The 4:3:1 immunization coverage estimate is 84.4 percent (130/154)**. This rate is higher than the statewide 4:3:1 immunization rate of 75.1 percent.

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



- **The 4:3:1+3 immunization coverage estimate is 77.9 percent (120/154)**. This rate is higher than the statewide 4:3:1+3 immunization rate of 66.7 percent.

Table 110:
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	2001 Adequate Rates
4 DTP/DTaP	79.0%	74.4%	78.9%	74.7%	85.1%
3 OPV/IPV	85.7%	89.1%	86.5%	76.0%	88.3%
1 MMR	81.9%	82.2%	84.8%	77.3%	89.6%
3 Hib	86.7%	88.4%	87.7%	79.9%	94.2%
3 HepB	81.0%	86.0%	87.7%	79.9%	91.6%
1 Varicella*	---	11.6%	52.0%	55.8%	87.0%

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

Table 110 reveals the coverage rates of each vaccine series by the second birthday. Vaccine coverage rates ranged from 85.1 to 94.2 percent for the 2001 study data.

Table 111 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 111:
2001 District Immunization Rates by Individual Vaccine at 12 Months of Age for Health District 10-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	152	98.7%
DTP2/DTaP2	149	96.8%
DTP3/DTaP3	139	90.3%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	151	98.1%
OPV/IPV2	147	95.5%
OPV/IPV3	45	29.2%
OPV/IPV4	0	0.0%
MMR1	4	2.6%
MMR2	0	0.0%
HIB1	152	98.7%
HIB2	149	96.8%
HIB3	93	60.4%
HIB4	1	0.6%
HIB5	0	0.0%
HEPB1	151	98.1%
HEPB2	149	96.8%
HEPB3	84	54.5%
HEPB4	0	0.0%
VAR1	3	1.9%
VAR2	0	0.0%

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

Table 112:
Crosstabulations of Maternal Race and Child Immunization Status for Health District 10-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	52/67 (77.6)	73/98 (74.5)	109/141 (77.3)	98/118 (83.1)
Black	27/32 (84.4)	21/30 (70.0)	25/28 (89.2)	32/35 (91.4)
Other	4/6 (66.7)	1/1 (100.0)	1 /2 (50.0)	0/1 (0.0)
Total	83/105 (79.0)	95/129 (73.6)	135/171 (78.9)	130/154 (84.4)

*Excludes 1999-00 study year.

Table 112 contains a cross-tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- Table 112 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rates of children born to white mothers were lower than that of black mothers in the 1996-97, 1998-99, and 2001 study years.

Table 113:
Crosstabulations of Maternal Educational Level and Child Immunization Status for Health District 10-0 by Study Year*

	1996-97 4:3:1 Adequate	1997-98 4:3:1 Adequate	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	5/5 (100.0)	7/8 (87.5)	2/3 (66.7)	14/18 (77.8)
Some high school	20/23 (87.0)	26/33 (78.8)	25/33 (75.8)	28/32 (87.5)
High school graduate	37/49 (75.5)	34/49 (69.4)	50/66 (75.8)	48/59 (81.4)
Some college	5/8 (62.5)	13/19 (68.4)	33/39 (84.6)	23/26 (88.5)
College or more	15/18 (83.3)	15/20 (75.0)	25/30 (83.3)	17/19 (89.5)
Unknown	1/2 (50.0)	---	---	---
Total	83/105 (79.0)	95/129 (73.6)	135/171 (78.9)	130/154 (84.4)

*Excludes 1999-00 study year.

Table 113 shows the crosstabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- The immunization status of the children in District 10-0 varies with educational attainment.

Table 114:
Crosstabulations of Maternal Medicaid Status and Child Immunization Status for Health District 10-0

	2001 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)
Medicaid	57/69 (82.6)
Non-Medicaid	73/85 (85.9)
Total	130/154 (84.4)

Table 114 shows immunization status of children born to women stratified by Medicaid status. For Health District 10-0, children born to non-Medicaid women had a slightly higher immunization rate than children born to women using Medicaid.

Section V:
Discussion of Results

Section V: Discussion

Summary

The purpose of the fifth 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 1999-00. To assess these rates, the study drew an original sample of 4,205 children born in January 1999. The final sample of returned immunization records totaled 4,205. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 4,061. Of these, 2,755 were located and make up the final sample.

The fifth year of the GIS, 2001, measured immunization coverage for children born in 1999 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, 1999-00, and 2001. The newer 4:3:1+3 measure of

*It must be remembered that the 2001 study is estimating 1999 rates. The 1999-00 study is estimating 1997 rates, 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, 1998-99,1999-00, and 2001.

The 2001 results reflect immunization rates for children born in 1999. The results of the study indicate that, of the 2,755 children whose immunization records were located during 2001 data collection:

- 66.7 percent of children born in January of 1999 in Georgia were adequately immunized with the 4:3:1+3 vaccine series, compared to 56.3 percent in those who were born in November of 1997.

- 75.1 percent of children born in January of 1999 in Georgia were adequately immunized with the 4:3:1 vaccine series, compared to 78.8 percent of children born in November 1997, 71.3 percent of those born in April of 1995 and 79.6 percent of those born in April of 1994.

4:3:1 immunization rates in the individual health districts ranged from

- 42.4 percent to 94.8 percent in the 2001 study
- 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 fifth study year, 69.5 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 1999-00 study to the 2001 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 few years. In fact, the most recent addition to the series, the Varicella vaccine, was only recommended for use in 1995 and was first available statewide in January, 1997. The 2001 Georgia Immunization Study (GIS) measured Varicella rates for the fourth 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.

In reviewing the 4:3:1 vaccine series, rates slightly decreased statewide from the 1999-00 study (78.8 percent) to the 2001 study (75.1 percent) and are less than the 79.6 percent coverage in the 1996-97 study.*

The results of the previous four years of the GIS study (1997-98, 1998-99, 1999-00, and 2001) show that immunization-specific coverage rates for the state remained relatively similar during the years when all shots were given, 1997-1998, 1996-97 and 1995-96, respectively.

With the exception of Varicella and Hepatitis B, coverage rates demonstrated by the second, third, fourth, and fifth year of the GIS, (1997-98, 1998-99, 1999-00, and 2001) 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, 1997, and 1999.

* It must be remembered that the 2001 study is estimating 1999 rates. The 1999-00 study is estimating 1997 rates; the 1998-99 study is estimating 1996 rates; the 1997-98 study is estimating 1995 rates; and the 1996-97 study estimated rates for 1994.

Strengths

1. This study represents Georgia's fifth 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, 1997, and 1999 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 3 percent for the 2001 study.

Limitations

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

1. There were three limitations related to sampling. First, although the study included a random sample of children born in January 1999 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 1999, 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 of the information.

2. Each year of the study fewer records were found in the public health system and consequently more parents had to be located. Parents in the Metro Atlanta area more often refused to participate (District 3-2 and 3-5). Response rates tended to be lower in the Metro area (District 3-1, 3-2, 3-3, and 3-5).

APPENDIX A:

DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

APPENDIX A: DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

The target population for this study was children born in the state of Georgia in 1999 who were residing in the state in 2001. Children who were born in Georgia to mothers who were not Georgia residents were excluded, since Georgia was not responsible for the health care of these children. Children born on military bases were excluded because they fall under their own health care system and their immunization records were not obtainable. Those who died or moved out of state before their second birthday were also excluded because Georgia was no longer responsible for their immunization status. Adopted children were excluded because they were untraceable.

The sampling frame for the study was all infants born in January 1999 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 1999. From this sampling frame, independent random samples of birth certificate data were drawn for each health district in Georgia, in accordance with the required sample sizes. At the time of sample selection, children born in military hospitals and children known to have died within the first year of life were eliminated from the sampling frame. However, it was impossible to eliminate from the sampling frame children born to military families who were not born in a military hospital, children who were adopted, and children who died after the first year of life or who moved out of state during 2001. 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 115: Data Used for Sample Size Estimates for the 2001 Study. Response rates and immunization coverage levels from the 1999-00 study were used in the sample size calculation for the 2001 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 1999-00 study. The final calculated sample size is shown in the last column (Column H) of Table 115. 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 41.8 percent to a high of 97.0 percent, with the average response rate for the state at 69.8 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 115:
Data Used for Sample Size Estimates for the 2001 Study

A	B	C	D	E	F	G	H
Health District	**Jan 1999 Total Births**	**Jan 1999 Eligible Births**	**1999-00 4:3:1 Immunization Rates**	**2001 First Sample Estimate**	**2001 Second Sample Estimate**	**Return Rate based on 1999-00 Eligible Sample**	**2001 Adjusted Sample Size**
1-1	680	670	0.675	337.100	224.265	0.885	253
1-2	398	391	0.753	285.801	165.112	0.806	205
2-0	590	580	0.885	156.392	123.178	0.609	202
3-1	911	889	0.756	283.455	214.926	0.547	393
3-2	1127	1098	0.696	325.128	250.849	0.467	537
3-3	312	304	0.607	366.567	166.182	0.514	304
3-4	912	886	0.945	79.867	73.263	0.801	91
3-5	835	821	0.649	350.045	245.411	0.659	372
4-0	694	678	0.797	248.615	181.910	0.67	272
5-1	152	150	0.913	122.057	67.297	0.99	68
5-2	547	531	0.836	210.679	150.834	0.775	195
6-0	466	460	0.723	307.744	184.387	0.906	204
7-0	471	391	0.771	271.308	160.169	0.704	228
8-1	309	299	0.86	185.011	114.292	0.957	119
8-2	448	440	0.837	209.645	141.991	0.894	159
9-1	344	314	0.785	259.346	142.034	0.985	144
9-2	378	367	0.85	195.922	127.732	0.938	136
9-3	303	217	0.822	224.835	110.424	0.835	132
10-0	419	408	0.734	300.020	172.888	0.905	191
State	**10296**	**9894**	**0.788**			**0.722**	**4205**

Figure 23:
Explanations of Table 115
Data Used for Sample Size Estimates
For 2001 Study

Column A:	**Health District**	District number.
Column B:	**January 1999 Total Births**	Given. Source: DHR Vital Statistics Office.
Column C:	**January 1999 Eligible Births**	
Column D:	**1999-00 4:3:1 Immunization Rates**	Given. Source: Georgia Birth Cohort Follow-up Study (1998-99).
Column E:	**First Sample Estimate - 2001 Study**	Formula Used: 3.8416 x (D) (1 – D) / .0025
Column F:	**Second Sample Estimate - 2001 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 (1999-00).
Column H:	**Adjusted Sample Size - 2001 Study**	Formula Used: (Column F) / (Column G)

APPENDIX B:

LIST OF 2001 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

APPENDIX B: LIST OF 2001 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

Health District	Public Health Representative
1-1	Rosemarie Newman
1-2	Ann Vossen, R.N.
2-0	Annette Harkins, R.N.
3-1	Joy Stymest
3-2	Georgia Goseer, R.N. Likesar McCray
3-3	Debbie Hall Kelly Little Freda Sheppard
3-4	Kathy Heidish, R.N.
3-5	Mike Bynum William Ashford
4-0	Michelle Heard, R.N., B.S.N.
5-1	Susan Beckham, R.N.
5-2	Claire Morin, M.D. JoAnn Bryant, R.N.
6-0	Melba McNorril, R.N. Darlene Morris, R.N.
7-0	Beverly Roberson, R.N., B.S.N.
8-1	Kirsten Wright, M.P.H
8-2	Rhonda L. Schell
9-1	Susan Malone, R.N.
9-2	Glynda Woodard, R.N. Lisa Boyett Hollard Phillips, M.S. Doris Wibon, B.S. Stacy Giles, R.N. JoAnn Deas, R.N. Pat Thomas, R.N. Linda Sornson, R.N.
9-3	Robert Hamilton
10-0	Noelle Broadnax Barbie Bushey, R.N., C.P.N., M.P.H.

APPENDIX C:

DATA COLLECTION FORM

GEORGIA IMMUNIZATION STUDY 2001: TWO YEAR-OLD ASSESSMENT

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

Part A: Identifying Information

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

Part B: Immunization History

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

Part C: Data Collection

A. Health Department
1. All immunizations complete (END)
2. Child ineligible (go to D)
3. No record of the child (go to B)
9. Incomplete Immunizations (go to B)

B. Parent
1. All immunizations complete (END)
2. Child ineligible (go to D)
3. Parent refused (END)
4. Parent moved to another health district
   Write new address in the upper right space
   (Send to state)
5. Parent not found (go to C)
6. Parent failed to follow up (go to C)
9. Incomplete immunizations (go to C)

C. Physician
1. All immunizations complete (END)
2. Child ineligible (go to D)
3. Physician refused (go to E)
4. Physician not found (go to E)
5. Record not found (go to E)
6. Physician not known (go to E)
9. Incomplete immunizations (go to E)

D. Reason Ineligible
1. Child died (END)
2. Parent in military (END)
3. Parent moved out of state (END)
4. Child adopted (END)

Approved Abbreviations

HD = Health Department PC = Phone Call
MD = Physician TU = Thank You
Hosp. = Hospital UNK = Unknown
Hx = History of Varicella Disease, record the date.

E. Incomplete Immunization Due to:
1. Religious reasons (END)
2. Medical reasons (END)
3. Other – Specify_____(END)
4. Unknown (END)

Part D: Tracking Log – Description of Contact Activity

CONTINUE PART D ON THE BACK OF THIS FORM AS NECESSARY

Print Name of Public Health Rep. who completed form:	Date completed	Signature of Public Health Rep. who completed form:

Part D: Tracking Log – Description of Contact Activity

DATE	TIME	A C T I O N

APPENDIX D:

VARICELLA VACCINE AND CHICKEN POX DATA

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 116 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 three studies (1997-98, 1998-99 and 1999-00) 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 year's 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 physicians. The percent column is equal to the number of children who had chicken pox divided by the district's final sample size.

Table 116:
2001 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	134	80.7	139	83.7	3	1.8
1-2	115	78.8	121	82.9	2	1.4
2-0	124	91.9	128	94.8	3	2.2
3-1	120	69.0	126	72.4	2	1.1
3-2	132	44.4	132	44.4	1	0.3
3-3	82	69.5	82	69.5	0	0.0
3-4	68	86.1	68	86.1	0	0.0
3-5	157	80.1	159	81.1	2	1.0
4-0	164	79.6	171	83.0	6	2.9
5-1	51	85.0	52	86.7	1	1.7
5-2	80	72.7	88	80.0	1	0.9
6-0	132	81.5	143	88.3	3	1.9
7-0	115	68.9	125	74.9	4	2.4
8-1	79	76.7	81	78.6	4	3.9
8-2	127	95.5	128	96.2	1	0.8
9-1	81	65.9	88	71.5	1	0.8
9-2	112	85.5	116	88.5	2	1.5
9-3	65	68.4	66	69.5	7	7.4
10-0	127	82.5	134	87.0	0	0.0
Statewide	**2,065**	**75.0**	**2,147**	**77.9**	**43**	**1.6**

Figure 24: 2001 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

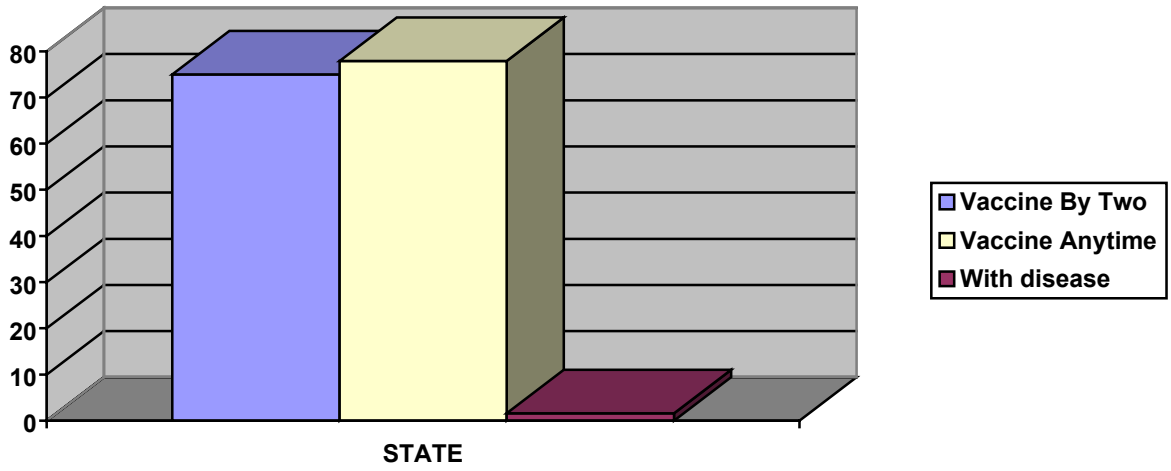


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

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), Four (1999-00), and Five (2001) 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 117.

Table 117:
Statewide Percentage of Shots by Provider: 1998-99, 1999-00, and 2001

Provider	1998-99 Total # of Shots Given	1998-99 Percent	1999-00 Total # of Shots Given	1999-00 Percent	2001 Total # of Shots Given	2001 Percent
Public Health Department	20,222	45.1%	11,248	29.0%	9,472	25.5%
Private Physician	22,686	50.6%	23,984	61.9%	25,797	69.5%
Unknown	1,934	4.3%	3,503	9.0%	1,866	5.0%
Total	**44,842**	**100.0%**	**38,735**	**100.0%**	**37,135**	**100.0%**

As shown in Table 117, in 2001, nearly 70% of the shots recorded for the sampled children were given by a private provider.

Location of Immunizations by District

Table 118 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 118:
District Specific Percentage of Shots by Provider 2001

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	Percent	# Shots Given	Percent	# Shots Given	Percent	
1-1	633	26.5	1,572	65.7	187	7.8	2,392
1-2	344	16.0	1,751	81.3	58	2.7	2,153
2-0	421	20.3	1,569	75.9	78	3.8	2,068
3-1	446	18.9	1,305	55.3	608	25.8	2,359
3-2	608	28.7	1,037	48.9	476	22.4	2,121
3-3	320	20.2	1,047	66.2	215	13.6	1,582
3-4	35	3.1	1,085	96.9	0	0.0	1,120
3-5	613	22.0	2,108	75.7	62	2.3	2,783
4-0	737	25.4	2,157	74.2	12	0.4	2,906
5-1	377	43.7	454	52.5	33	3.8	864
5-2	678	44.9	775	51.4	56	3.7	1,509
6-0	360	14.5	2,114	84.9	16	0.6	2,490
7-0	800	36.1	1,411	63.8	2	0.1	2,213
8-1	425	30.6	962	69.3	1	0.1	1,388
8-2	600	29.6	1,426	70.4	0	0.0	2,026
9-1	283	16.7	1,371	81.1	37	2.2	1,691
9-2	1,050	53.9	887	45.5	12	0.6	1,949
9-3	296	23.6	950	75.7	9	0.7	1,255
10-0	446	19.7	1,816	80.1	4	0.2	2,266
State	**9,472**	**25.5**	**25,797**	**69.5**	**1,866**	**5.0**	**37,135**

In Year Five:

- In one district, more than 50% of the shots were given in the **Public Health Departments.**
- In seventeen 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 all of these districts private physicians gave the majority of the immunizations.

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

  In the metro-Atlanta area more of the immunizations were administered in the private sector than in the public sector. District 3-4, Gwinnett County, had zero unknown shot locations, while District 3-1, Cobb County had the highest number of unknown shot locations (25.8 percent).

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

  Children in all of the central districts received the majority of their shots at a private provider. However, in districts 5-1 and 5-2 the percentages between the health department and private provider were more evenly distributed.

- **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 53.9% were given by the health department.

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, 1999-00, and again in 2001 a more direct method of collecting this data replaces the “proxy” measure used in the 1997-98 study. The comparisons reflect a movement of immunization services into the private sector in Georgia.

Table 119:
Location of Immunizations by District
Four Year Comparison
1997-98, 1998-99, 1999-00, 2001

District	Public Health Department				Private Physician			
	97-98*	98-99	99-00	2001	97-98*	98-99	99-00	2001
1-1	82.9	55.9	51.7	26.5	5.4	44.1	44.2	65.7
1-2	61.1	34.5	24.9	16.0	20.4	63.6	72.6	81.3
2-0	65.2	60.5	35.5	20.3	23.2	39.3	48.3	75.9
3-1	57.4	41.9	18.8	18.9	37.2	56.0	57.5	55.3
3-2	69.4	24.9	30.6	28.7	30.0	59.3	60.2	48.9
3-3	57.0	34.8	19.1	20.2	35.4	39.6	53.4	66.2
3-4	63.9	17.5	8.9	3.1	33.3	80.2	77.1	96.9
3-5	58.6	24.4	25.9	22.0	33.8	65.7	65.9	75.7
4-0	95.9	62.4	35.8	25.4	4.1	36.3	61.0	74.2
5-1	59.4	44.5	51.8	43.7	27.4	55.3	43.2	52.5
5-2	97.9	60.1	46.3	44.9	1.4	38.8	53.6	51.4
6-0	63.6	30.0	34.9	14.5	21.7	70.0	59.8	84.9
7-0	62.9	60.5	36.1	36.1	23.1	37.1	55.6	63.8
8-1	60.5	60.9	23.1	30.6	30.2	35.1	76.3	69.3
8-2	77.3	70.3	26.5	29.6	13.6	29.7	59.8	70.4
9-1	91.9	41.9	14.4	16.7	1.5	52.8	81.7	81.1
9-2	87.8	81.3	57.9	53.9	9.8	17.1	39.7	45.5
9-3	76.5	52.0	31.0	23.6	8.8	47.4	61.2	75.7
10-0	74.8	40.7	34.1	19.7	8.9	57.9	65.8	80.1
State Totals	**71.0**	**45.1**	**29.04**	**25.5**	**20.1**	**50.6**	**61.92**	**69.5**

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

Four Year Comparison: Summary of Table 119

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 1997-98 study year, 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

In 2001 25.5% of the shots were received at the health department
69.5% of the shots were given in the private sector
5.0% of the shot locations were unknown

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 120-122. The formula used to calculate the margins of error in these tables was:

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

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

- With 95% confidence, the true statewide 4:3:1 immunization rate for infants born in 1999 is between 73.6 and 76.6 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 120:
Margins of Error for 2001
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	68.1	+/- 7.1	61.0 – 75.2
1-2	146	71.2	+/- 7.3	63.9 – 78.5
2-0	135	88.9	+/- 5.3	83.6 – 94.2
3-1	174	64.4	+/- 7.1	57.3 – 71.5
3-2	297	40.4	+/- 5.6	34.8 – 46.0
3-3	118	50.8	+/- 9.0	41.8 – 59.8
3-4	79	74.7	+/- 9.6	65.1 – 84.3
3-5	196	69.4	+/- 6.5	62.9 – 75.9
4-0	206	75.2	+/- 5.9	69.3 – 81.1
5-1	60	80.0	+/- 10.1	69.9 – 90.1
5-2	110	55.5	+/- 9.3	46.2 – 64.8
6-0	162	72.2	+/- 6.9	65.3 – 79.1
7-0	167	59.9	+/- 7.4	52.5 – 67.3
8-1	103	66.0	+/- 9.1	56.9 – 75.1
8-2	133	86.5	+/- 5.8	80.7 – 92.3
9-1	123	53.7	+/- 8.8	44.9 – 62.5
9-2	131	80.2	+/- 6.8	73.4 – 87.0
9-3	95	61.1	+/- 9.8	51.3 – 70.9
10-0	154	77.9	+/- 6.6	71.3 – 84.5
Statewide Rate (weighted)	**2,755**	**66.7**	**+/- 1.8**	**64.9 – 68.5**

Table 121:
Margins of Error for 2001
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	78.9	+/- 6.2	72.7 – 85.1
1-2	146	78.1	+/- 6.7	71.4 – 84.8
2-0	135	94.8	+/- 3.7	91.1 – 98.5
3-1	174	70.7	+/- 6.8	63.9 – 77.5
3-2	297	42.4	+/- 5.6	36.8 – 48.0
3-3	118	57.6	+/- 8.9	48.7 – 66.5
3-4	79	75.9	+/- 9.4	66.5 – 85.3
3-5	196	75.5	+/- 6.0	69.5 – 81.5
4-0	206	83.5	+/- 5.1	78.4 – 88.6
5-1	60	85.0	+/- 9.0	76.0 – 94.0
5-2	110	69.1	+/- 8.6	60.5 – 77.7
6-0	162	88.9	+/- 4.8	84.1 – 93.7
7-0	167	73.1	+/- 6.7	66.4 – 79.8
8-1	103	76.7	+/- 8.2	68.5 – 84.9
8-2	133	93.2	+/- 4.3	88.9 – 97.5
9-1	123	69.1	+/- 8.2	60.9 – 77.3
9-2	131	90.8	+/- 4.9	85.9 – 95.7
9-3	95	71.6	+/- 9.1	62.5 – 80.7
10-0	154	84.4	+/- 5.7	78.7 – 90.1
Statewide Rate (weighted)	**2,755**	**75.1**	**+/- 1.5**	**73.6 – 76.6**