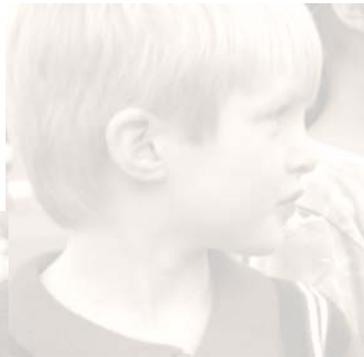


GEORGIA IMMUNIZATION STUDY

2003 Final Report



Georgia Department of Human Resources
Division of Public Health
Epidemiology Branch
Prevention Branch, Immunization Program
Nineteen Public Health Districts

Prepared by

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Acknowledgments

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

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

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

2003 Executive Summary

The 2003 Immunization Study was conducted by the Georgia Department of Human Resources, Division of Public Health, Epidemiology Branch, Immunization Program and Public Health Districts. However, this study could not have been conducted without the assistance of the private providers, non-public health providers and the Vaccines for Children providers that contributed in this collaborative effort. Their cooperation and assistance throughout the study is greatly appreciated.

The Immunization Study employs a non-experimental retrospective cohort research design in order to ascertain the immunization coverage rate for children born in the State of Georgia. This study design allows for the calculation of immunization rates for children who turned two in January 2003. Identifying information about the children and their parents was collected from birth certificates.

The Immunization Study showed that during 2003 most childhood immunizations (75 percent) were administered in the private sector, while County Health Departments immunized 16 percent, and the sources for 9 percent are unknown. The proportion of children in Georgia who have received all of the recommended vaccinations increased steadily from 16 percent in 1997 to 79 percent in 2002, with a slight decline in 2003 to 74 percent.

Acute infection with Hepatitis B causes severe disease in only a small proportion of those infected, but it can lead to chronic infection, cirrhosis, and cancer of the liver. In Georgia in 2003, 91 percent of infants had received two doses of hepatitis B vaccine by 12 months of age, and, at 24 months, 88 percent of children had received the recommended three doses.

Vaccines have largely controlled diphtheria, measles, pertussis, and other scourges of the past. In 1923, with a population of less than three million, Georgia recorded 274 deaths from diphtheria, 347 deaths from measles, and 254 deaths from pertussis, while in 2003, just 80 years later, and with a population that has almost tripled, Georgia had no reported cases of tetanus or diphtheria, and just 36 cases of pertussis. In 2003, 85 percent of children 12 months of age were appropriately immunized against diphtheria, tetanus and pertussis, and 74 percent of Georgia's two-year-olds were adequately immunized against ten vaccine-preventable childhood diseases (diphtheria, tetanus, pertussis, hepatitis B, *H. influenzae* type B, mumps, measles, rubella, polio and varicella).

There was considerable variation from district to district in the proportion of two-year-olds reported to be fully immunized, ranging from 59 percent in the DeKalb district to 92 percent in the North (Gainesville) district. Three of the state's public health districts (Gainesville, Valdosta and Athens) succeeded in immunizing at least 85 percent of their two-year-olds against the 10 vaccine-preventable childhood diseases. Nine of the public health districts (Rome, Cobb-Douglas, Fulton, DeKalb, Columbus, Albany, Savannah, Waycross and Brunswick) had a rate less than 75 percent. Within Metropolitan Atlanta, the immunization rates varied from 59 percent in DeKalb to 83 percent in Gwinnett. In

Georgia outside Metropolitan Atlanta, the immunization rates ranged from 61 percent in Savannah to 92 percent in the Gainesville district (see Map below).

There was minor variation in immunization status of children by the race and education of their mothers, and by whether their mothers were Medicaid recipients. Among children of white women, 78 percent were adequately immunized, while among children of black women, 70 percent were adequately immunized. Children of college-educated mothers had slightly higher immunization rates (79 percent) than children of mothers with less than high school education (76 percent). The children of mothers who did not receive Medicaid were more likely to be adequately immunized (79 percent) than were children of mothers who did receive Medicaid (72 percent).

Map 2. Georgia Vaccination Rates (4:3:1:3:3:1) by Public Health District, 2003

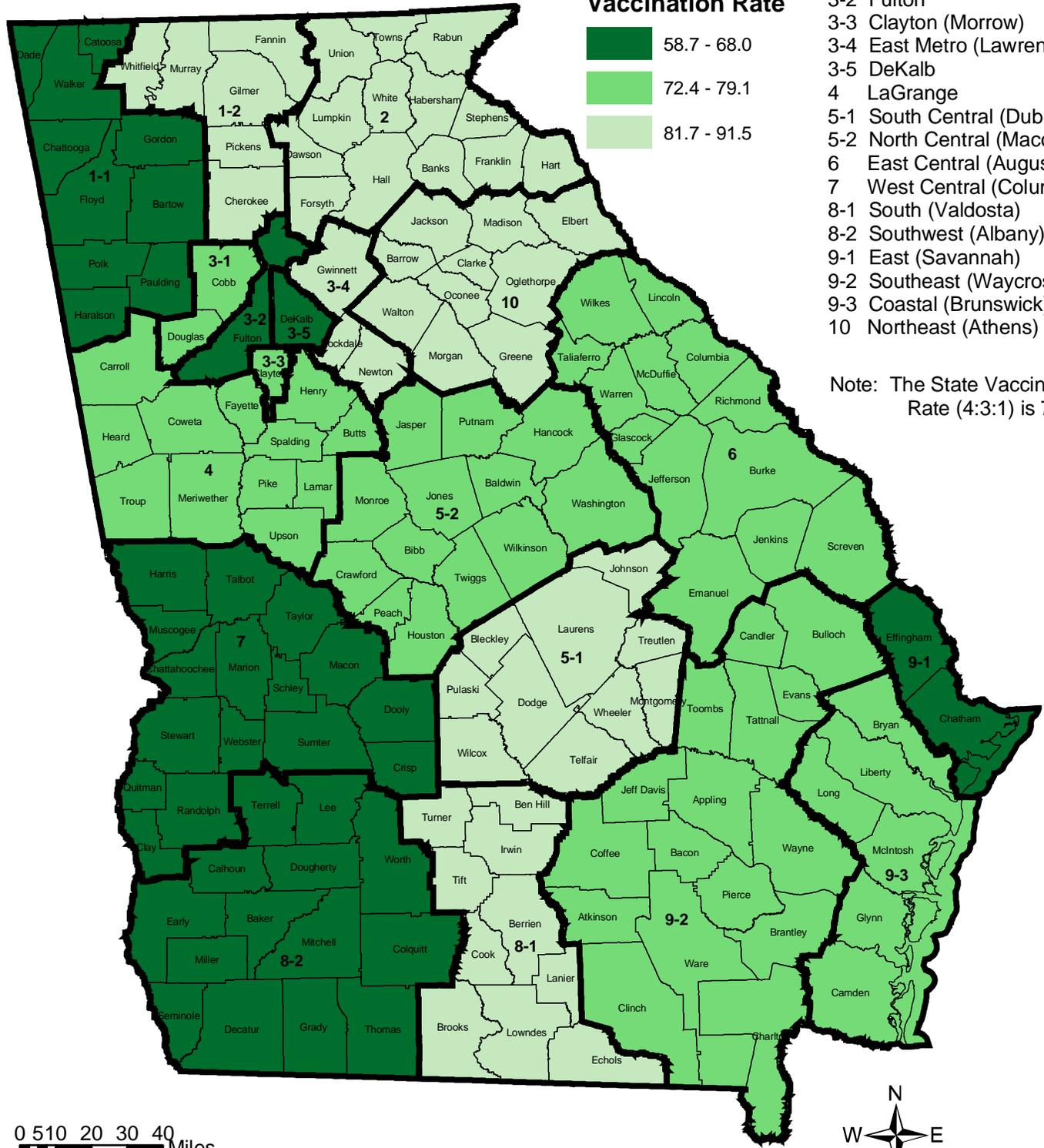
 Health Districts
 Counties

Vaccination Rate

 58.7 - 68.0
 72.4 - 79.1
 81.7 - 91.5

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

Note: The State Vaccination Rate (4:3:1) is 74.3



0 10 20 30 40 Miles



Georgia Department of Human Resources
 Division of Public Health
 Office of Health Information & Policy

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SECTION I:

PROJECT OVERVIEW

SECTION I: PROJECT OVERVIEW AND INTRODUCTION

The Division of Public Health, Epidemiology Branch, Immunization Program and Health Districts collaborated on the 2003 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. The fifth year, 2001 examined immunization rates for children born in 1999. The sixth year, 2002 examined immunization rates for children born in 2000. This year, immunization rates for children born in January 2001 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 Project Coordinator was Carol A. Hoban, MS, MPH. Ms. Hoban performed data entry and analysis.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in November 2002. During December 2002, 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 2003.

During January, a training session for the public health representatives was held via conference call. Data were collected from February 2003 through August 2003. (Data collection continued on some difficult to obtain records through the end of September 2003). 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, 2002
Initial notification of public health community Immunization Coordinators Health Directors	December, 2002
Initial notification of private health community	January, 2003
One day training for public health representatives	January, 2003
Data collection period	February – August, 2003
Data entry period	February – November, 2003
Double data entry of 5% of data forms	December, 2003
Final data cleaning and analysis of data	December-January, 2003
Final Report	January, 2004

* Throughout this report, we refer to study years one, two, three, four, and five as 1998-99, 1999-00, 2001, 2002, and 2003 respectively. The results from these five study years refer to rates for 1996, 1997, 1999, 2000, and 2001 respectively.

Data collection was extended beyond August 2003 in 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

SECTION II: METHODOLOGY

Research Design

The seventh 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 2001. In this retrospective study, all of the immunizations should have occurred prior to the initiation of the project. However, during the data collection time period children that were not up-to-date on all immunizations were allowed to receive their shots. The study design allowed for the calculation of immunization rates for children who turned two in January 2003. Identifying information about the children and their parents was collected from birth certificates.

Target and Sample Populations

The target population of the seventh year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 2001. A sample size of 3,813 children born in the month of January 2001 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 2001. Information for each child, including all birth certificate variables available, was downloaded into an ASCII file. Examples of the type of birth certificate information obtained for each child include:

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

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

Preparation for Data Collection

Public health representatives in each health district completed the data collection procedures. Division of Public Health staff trained the representatives via a conference call during January 2003. During this training, the public health representatives:

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

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

Data Form Development

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

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

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

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

The immunization dates for each particular vaccination were recorded in the section labeled "Part B: Immunization History." There were spaces available for five Diphtheria, Tetanus, Pertussis (DTP/DTaP) vaccines, four Polio (OPV/IPV) vaccines, two Measles, Mumps, Rubella (MMR) vaccines, five *Haemophilus Influenza* type B (Hib) vaccines, four Hepatitis B (Hep B) vaccines, 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.

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

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

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

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

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

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

Data Entry

The principal investigator reviewed each record prior to entry into the Epi Info database. Attempts were made to resolve any unclear information with the public health representative before data entry.

Data cleaning and double data entry were done in the month of December 2003. 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 98.0% was found.

Analysis Plan

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

SECTION III:

RESULTS OF STATEWIDE ANALYSES

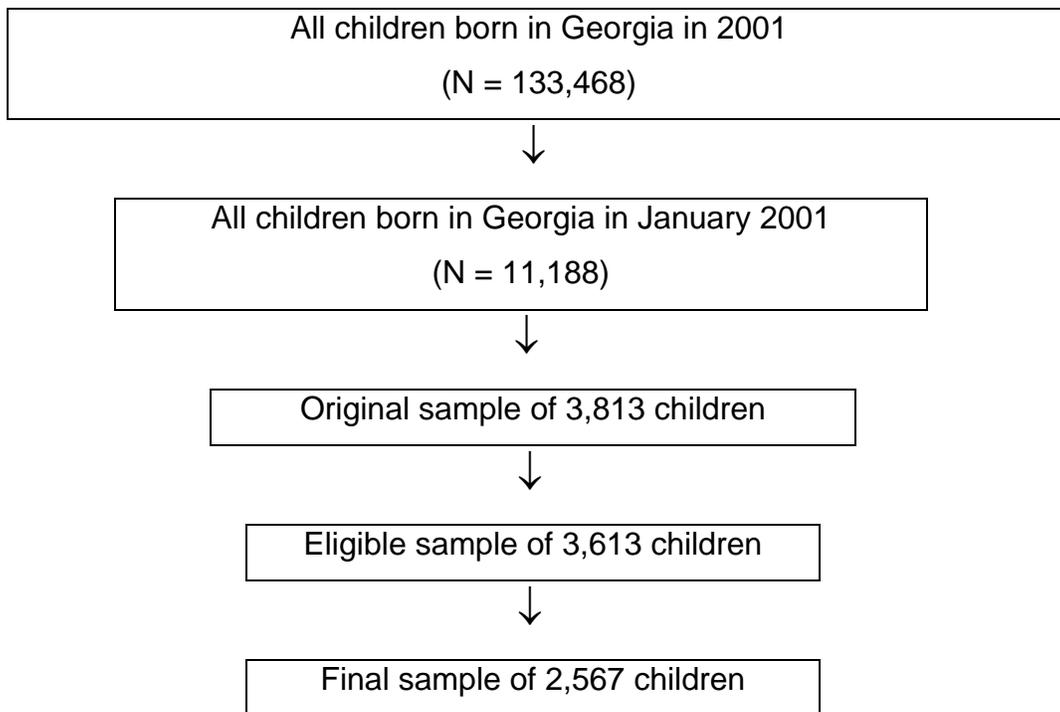
SECTION III: RESULTS OF STATEWIDE ANALYSES

Sampling

The sample of 3,813 children was drawn from 11,188 children born in Georgia in January 2001. A total of 133,468 children were born in Georgia during 2001.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 3,613. (Ineligible children were those who were deceased, adopted, moved out of state, or were known to be part of a military family.) Figure 1 below depicts the stages of the sampling procedure.

Figure 1: Sampling Procedure



Of the 3,613 children in the eligible sample, 2,567 children were located, 932 children never were located and 114 parental refusals were removed. The resulting final sample consisted of 2,567 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 2,567 children represented 71 percent of the eligible sample.

**Table 2:
Sample Description**

Sampling Step	Number	Percent of Sample
Original Sample	3,813	100.0%
Deceased	2	0.1%
Adopted	6	0.2%
Moved out of state	125	3.2%
Military	67	1.7%
Eligible Sample	3,613	94.8%
Eligible Sample	3,613	100.0%
Records Not Located /Eligibility Unknown *	1,046	29.0%
Final Sample (Located Records**)	2,567	71.0%

* **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=8] 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 2003 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 36.1 percent to a high of 98.9 percent, with a statewide average response rate of 74.2 percent.

Table 3:

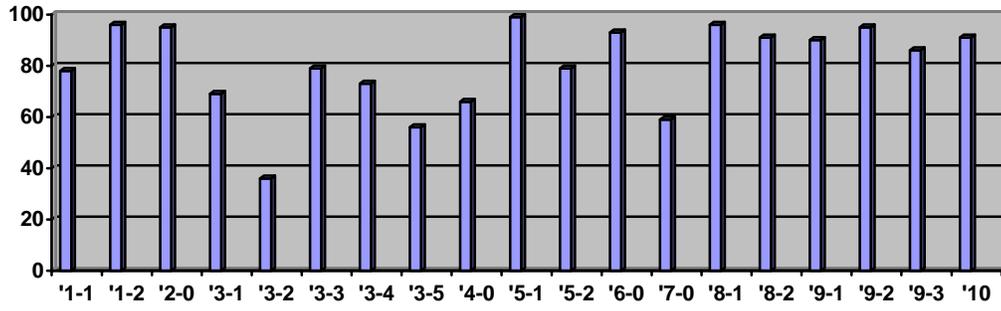
2003 Eligible Sample, Number Located and Response Rates by District

Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	198	155	78.3%
1-2	172	165	95.9%
2-0	109	103	94.5%
3-1	221	152	68.8%
3-2	487	176	36.1%
3-3	344	271	78.8%
3-4	89	65	73.0%
3-5	270	152	56.3%
4-0	180	119	66.1%
5-1	92	91	98.9%
5-2	175	138	78.9%
6-0	135	125	92.6%
7-0	236	140	59.3%
8-1	129	124	96.1%
8-2	166	151	91.0%
9-1	167	150	89.8%
9-2	147	140	95.2%
9-3	110	94	85.5%
10-0	185	169	91.4%
State	3,613	2,681	74.2%

*sample includes parental refusals

**number located / eligible sample

Figure 2
2003 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 2003 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	155	4	2.6
1-2	165	12	7.3
2-0	103	9	8.7
3-1	152	7	4.6
3-2	176	38	21.6
3-3	271	3	1.1
3-4	65	5	7.7
3-5	152	2	1.3
4-0	119	9	7.6
5-1	91	1	1.1
5-2	138	12	8.7
6-0	125	2	1.6
7-0	140	0	0.0
8-1	124	0	0.0
8-2	151	1	0.7
9-1	150	0	0.0
9-2	140	2	1.4
9-3	94	0	0.0
10-0	169	7	4.1
Total	2,681	114	4.3

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 2,567 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 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/DaTP, three OPV/IPV, and one MMR vaccination

- ❖ "3:3:1" status: used infrequently in this study - refers to a child who has received three DTP/DaTP, three OPV/IPV, and one MMR vaccination

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

Of the 2,567 children who were located in 2003, 74.3 percent were adequately immunized at the 4:3:1+3 level. This percent of adequately immunized children decreased from 78.9 percent in 2002.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1998-99	1,360	41.9	2,100	58.1
1999-00	1,573	56.3	1,220	43.7
2001	1,837	66.7	918	33.3
2002	2,146	78.9	575	21.1
2003	1,906	74.3	661	25.7

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. The number of adequately immunized children increased from 73.3 percent in 1998-99 to 78.8 percent in 1999-00, but decreased slightly to 75.1 percent in the 2001 assessment. The 2002 assessment had the highest percentage recorded since this study began with the number of adequately immunized children at 83.9 percent. During the 2003 assessment, the number of adequately immunized children decreased to 80.8 percent.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
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
2002	2,284	83.9	437	16.1
2003	2,075	80.8	492	19.2

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

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

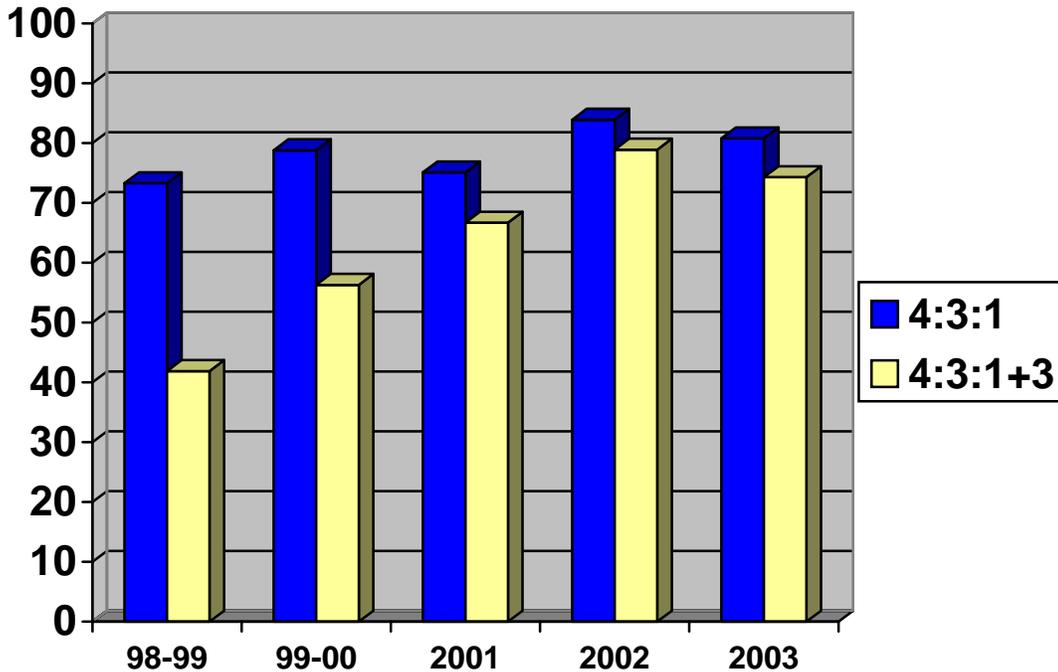


Figure 3 reveals the statewide 4:3:1 coverage rates for the 1998-99, 1999-00, 2001, 2002 and 2003 studies. The figure also shows statewide 4:3:1+3 vaccination coverage for the 1998-99, 1999-00, 2001, 2002 and 2003 studies.

The 3:3:1 immunization coverage rates allow for three DTP/DTaP instead of four DTP/DTaP. The number of OPV/IPV and MMR vaccinations remain the same. Table 7 indicates the 3:3:1 immunization coverage rate for the state increased during the 1998-99 and 1999-00 studies (78.4 and 82.0 respectively) and decreased slightly in the 2001 study to 78.9 percent. In the 2002 study the 3:3:1 rate increased to 88.8 percent, but has decreased slightly in 2003 to 85.9 percent.

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

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
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
2002	2,417	88.8	304	11.2
2003	2,205	85.9	362	14.1

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 1998-99, 1999-00, and 2001 none of the immunization rates met the state goal of 90 percent coverage; however, during the 2002 assessment nearly all vaccines were at or above the state goal of 90 percent coverage. In 2003, coverage rates decreased slightly, but still showed over 90 percent coverage for 3 DTP/DTap vaccine series. The coverage rate for the Varicella vaccine dramatically increased from 47.1 percent in 1998-99, to 64.3 percent in 1999-00, to 77.9 percent in 2001 and to 88.5 percent in 2002. The coverage rate for the Varicella vaccine decreased slightly in 2003 to 81.8 percent. (Note: The Hib vaccine status can be considered adequate with three or four shots, depending on the manufacturer of the vaccine. For this study, adequate immunization status for the Hib vaccines was calculated considering three Hib shots as "adequate").

Table 8:
State Immunization Status by Vaccine Series by Study Year

Vaccine	1998-99		1999-00		2001		2002		2003	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
3 DTP/DTaP	2,912	84.9	2,491	89.2	2,392	86.8	2,561	94.1	2,340	91.2
4 DTP/DTaP	2,545	74.2	2,233	79.9	2,093	76.0	2,303	84.6	2,096	81.7
3 OPV/IPV	2,864	83.6	2,358	84.4	2,226	80.8	2,466	90.6	2,251	87.7
1 MMR	2,752	80.2	2,363	84.6	2,258	82.0	2,474	90.9	2,266	88.3
3 Hib	2,866	83.6	2,441	87.4	2,322	84.3	2,474	90.9	2,242	87.3
3 Hep B	2,839	82.9	2,422	86.7	2,308	83.8	2,471	90.8	2,255	87.8
1 Varicella	1,620	47.1	1,795	64.3	2,147	77.9	2,407	88.5	2,101	81.8

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 1998-99, 1999-00, 2001, 2002 and 2003 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 98-99	Percent* 98-99	Number 99-00	Percent* 99-00	Number 2001	Percent* 2001	Number 2002	Percent* 2002	Number 2003	Percent* 2003
DTP/DTaP1	3,071	88.8%	2,588	92.7%	2,507	91.0%	2,667	98.0%	2,447	95.3%
DTP/DTaP2	2,976	86.0%	2,507	89.8%	2,426	88.1%	2,592	95.3%	2,367	92.2%
DTP/DTaP3	2,712	78.4%	2,327	83.3%	2,214	80.4%	2,394	88.0%	2,176	84.8%
DTP/DTaP4	81	2.3%	25	0.9%	12	0.4%	23	0.8%	8	0.3%
DTP/DTaP5	0	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
OPV/IPV1	3,063	88.5%	2,586	92.6%	2,504	90.9%	2,662	97.8%	2,442	95.1%
OPV/IPV2	2,965	85.7%	2,493	89.3%	2,412	87.5%	2,581	94.9%	2,350	91.5%
OPV/IPV3	2,411	69.7%	742	26.6%	601	21.8%	948	34.8%	1,004	39.1%
OPV/IPV4	8	0.2%	7	0.3%	1	0.0%	2	0.1%	3	0.1%
MMR1**	206	6.0%	117	4.2%	87	3.2%	34	1.2%	92	3.6%
MMR2	1	0.0%	1	0.0%	0	0.0%	1	0.0%	1	0.0%
HIB1	3,024	87.4%	2,569	92.0%	2,492	90.5%	2,651	97.4%	2,436	94.9%
HIB2	2,925	84.5%	2,482	88.9%	2,398	87.0%	2,569	94.4%	2,345	91.4%
HIB3	2,612	75.5%	2,220	79.5%	1,720	62.4%	1,267	46.6%	1,110	43.2%
HIB4	99	2.9%	61	2.2%	27	1.0%	15	0.6%	16	0.6%
HIB5	0	0.0%	1	0.0%	1	0.0%	0	0.0%	0	0.0%
HEPB1	3,068	88.7%	2,616	93.7%	2,508	91.0%	2,649	97.4%	2,440	95.1%
HEPB2	2,961	85.7%	2,527	90.5%	2,449	88.9%	2,542	93.4%	2,346	91.4%
HEPB3	2,419	69.9%	2,087	74.7%	1,803	65.4%	1,116	41.0%	1,264	49.2%
HEPB4	15	0.4%	23	0.8%	14	0.5%	17	0.6%	19	0.7%
VAR1**	160	4.6%	150	5.4%	118	4.3%	44	1.6%	125	4.9%
VAR2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.0%

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

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

Sample Size for 1998-99 study = 3,460; 1999-00 study = 2,793; 2001 study = 2,755; 2002 study = 2,721; 2003 study = 2,567.

Table 10 shows the 1998-99, 1999-00, 2001, 2002 and 2003 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 2003 margin of error for each health district ranges from +/- 4.5 percent to +/- 7.8 percent. The District level 2003 4:3:1 immunization rates range from 66.0 percent to 94.7 percent. Of the 19 health districts, five had an immunization coverage rate over 90 percent and seven districts had 2003 coverage rates between 80 and 90 percent. The following summary highlights the changes in 4:3:1 coverage rates between 2002 and 2003:

- ❖ Coverage increased between 0 and 5 percent in three districts (District 2-0, 3-1 and 3-3)
- ❖ Coverage increased between 5 and 20 percent in four districts (Districts 1-2, 5-1, 8-1 and 10-0)
- ❖ Coverage fell between 0 and 5 percent in eight districts (Districts 1-1, 3-4, 4-0, 5-2, 6-0, 9-1, 9-2 and 9-3)
- ❖ Coverage fell between 5 and 20 percent in four districts (Districts 3-2, 3-5, 7-0 and 8-2)

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

Dist	1998-99		1999-00		2001		2002		2003	
	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error
1-1	78.2	+/- 6.8	67.5	+/- 7.1	78.9	+/-6.2	80.6	+/-5.5	77.5	+/-6.7
1-2	74.9	+/- 6.4	75.3	+/-7.0	78.1	+/-6.7	79.1	+/-6.3	85.6	+/-5.6
2-0	66.7	+/- 6.8	88.5	+/-5.5	94.8	+/-3.7	93.4	+/-5.6	94.7	+/-4.5
3-1	58.1	+/- 6.5	75.6	+/-6.1	70.7	+/-6.8	84.5	+/-4.2	75.2	+/-7.0
3-2	53.8	+/- 5.4	69.6	+/-6.5	42.4	+/-5.6	82.6	+/-6.2	68.1	+/-7.8
3-3	76.3	+/- 7.1	60.7	+/-10.4	57.6	+/-8.9	73.9	+/-8.2	78.4	+/-4.9
3-4	65.0	+/- 5.6	94.5	+/-2.3	75.9	+/-9.4	94.3	+/-3.4	90.0	+/-7.6
3-5	63.0	+/- 5.5	64.9	+/-6.3	75.5	+/-6.0	84.6	+/-5.1	66.0	+/-7.6
4-0	67.5	+/- 5.6	79.7	+/-5.7	83.5	+/-5.1	87.1	+/-5.4	83.6	+/-6.9
5-1	87.1	+/- 7.1	91.3	+/-6.2	85.0	+/-9.0	80.8	+/-8.7	93.3	+/-5.2
5-2	94.5	+/- 2.8	83.6	+/-9.8	69.1	+/-8.6	84.7	+/-4.5	83.3	+/-6.5
6-0	96.1	+/- 2.8	72.3	+/-12.8	88.9	+/-4.8	89.2	+/-6.0	86.2	+/-6.1
7-0	67.9	+/- 7.8	77.1	+/-6.3	73.1	+/-6.7	82.8	+/-6.9	76.4	+/-7.0
8-1	80.4	+/- 8.1	86.0	+/-6.6	76.7	+/-8.2	82.2	+/-6.6	91.9	+/-4.8
8-2	83.8	+/- 6.1	83.7	+/-5.9	93.2	+/-4.3	83.1	+/-8.4	74.0	+/-7.0
9-1	80.4	+/- 6.5	78.5	+/-7.1	69.1	+/-8.2	80.9	+/-6.2	77.3	+/-6.7
9-2	83.5	+/- 6.6	85.0	+/-6.1	90.8	+/-4.9	85.4	+/-7.3	81.2	+/-6.5
9-3	60.6	+/- 9.2	82.2	+/-8.8	71.6	+/-9.1	85.6	+/-6.3	81.9	+/-7.8
10-0	78.9	+/- 6.1	73.4	+/-7.0	84.4	+/-5.7	80.2	+/-7.1	90.7	+/-4.5
State	73.3	+/- 1.5	78.8	+/-1.5	75.1	+/-1.5	83.9	+/-1.6	80.8	+/-1.6

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 1998-99, 1999-00, 2001, 2002 and 2003 data collection periods.

As shown in Table 11, 2003 district immunization rates for the DTP/DTaP vaccines ranged from 66.0 percent to 95.7 percent, with a statewide rate of 81.7 percent receiving all four doses. The 2003 statewide DTP/DTaP rate decreased slightly from the 2002 study year.

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

District	1998-99 Rates 4 DTP/DTaP	1999-00 Rates 4 DTP/DTaP	2001 Rates 4 DTP/DTaP	2002 Rates 4 DTP/DTaP	2003 Rates 4 DTP/DTaP
1-1	78.2%	67.5%	79.5%	81.1%	77.5%
1-2	75.4%	77.4%	79.5%	82.3%	86.3%
2-0	67.7%	89.3%	94.8%	94.7%	95.7%
3-1	59.0%	77.7%	70.7%	84.9%	76.6%
3-2	55.1%	71.1%	42.4%	84.0%	68.1%
3-3	76.3%	63.1%	61.0%	73.9%	79.1%
3-4	66.4%	94.8%	75.9%	94.9%	90.0%
3-5	64.4%	66.2%	77.0%	84.6%	66.0%
4-0	69.0%	79.7%	83.5%	87.8%	84.5%
5-1	87.1%	91.3%	86.7%	80.8%	93.3%
5-2	96.5%	83.6%	72.7%	85.5%	84.9%
6-0	96.1%	74.5%	89.5%	89.2%	87.8%
7-0	69.3%	77.1%	74.3%	83.6%	77.1%
8-1	81.5%	86.9%	77.7%	82.2%	91.9%
8-2	84.5%	85.6%	94.7%	85.7%	75.3%
9-1	80.4%	80.8%	69.9%	81.6%	77.3%
9-2	83.5%	88.0%	92.4%	86.5%	82.6%
9-3	64.2%	82.2%	71.6%	85.6%	83.0%
10-0	78.9%	74.7%	85.1%	80.2%	93.2%
State	74.2%	79.9%	76.0%	84.6%	81.7%

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

Table 12 shows the 1998-99, 1999-00, 2001, 2002 and 2003 state and district rates for the OPV/IPV vaccines. The 2003 district coverage rates for these vaccines varied between 71.7 percent and 97.8 percent. The 2003 statewide immunization rate for OPV/IPV was 87.7 percent, which is slightly lower than the previous year's study rate.

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

District	1998-99 Rates 3 OPV/IPV	1999-00 Rates 3 OPV/IPV	2001 Rates 3 OPV/IPV	2002 Rates 3 OPV/IPV	2003 Rates 3 OPV/IPV
1-1	90.8%	72.3%	88.6%	90.0%	84.8%
1-2	86.9%	82.2%	86.3%	85.4%	88.9%
2-0	73.7%	88.5%	97.0%	97.4%	94.7%
3-1	72.5%	79.3%	75.3%	90.8%	83.4%
3-2	64.9%	76.8%	45.5%	84.7%	71.7%
3-3	93.5%	71.4%	69.5%	82.9%	85.8%
3-4	72.9%	96.4%	77.2%	96.0%	90.0%
3-5	76.4%	75.7%	83.7%	88.7%	82.0%
4-0	80.2%	85.9%	86.4%	92.5%	92.7%
5-1	92.9%	93.8%	93.3%	96.2%	97.8%
5-2	98.0%	87.3%	81.8%	94.0%	93.7%
6-0	98.3%	85.1%	93.2%	95.1%	91.9%
7-0	83.2%	85.9%	78.4%	90.5%	85.0%
8-1	94.6%	87.9%	84.5%	91.5%	96.0%
8-2	90.1%	90.8%	96.2%	90.9%	80.7%
9-1	87.4%	88.5%	79.7%	90.1%	88.7%
9-2	93.4%	90.2%	92.4%	92.1%	88.4%
9-3	77.1%	86.3%	76.8%	89.8%	89.4%
10-0	86.5%	76.0%	88.3%	86.0%	93.2%
State	83.6%	84.4%	80.8%	90.6%	87.7%

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

Table 13 shows the 1998-99, 1999-00, 2001, 2002 and 2003 state and district rates for MMR. The 2003 district rates for MMR ranged from a low of 71.0 percent to a high of 97.8 percent, with a statewide rate of 88.3 percent coverage. This statewide rate for the MMR vaccine decreased from the 2002 rate of 90.9 percent.

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

District	1998-99 Rates 1 MMR	1999-00 Rates 1 MMR	2001 Rates 1 MMR	2002 Rates 1 MMR	2003 Rates 1 MMR
1-1	86.6%	73.5%	89.2%	90.5%	88.1%
1-2	84.6%	83.6%	85.6%	87.3%	90.8%
2-0	72.0%	90.1%	97.0%	96.1%	96.8%
3-1	64.0%	81.9%	77.0%	90.1%	80.7%
3-2	65.8%	77.8%	45.1%	84.7%	71.0%
3-3	84.9%	70.2%	74.6%	84.7%	85.1%
3-4	69.7%	96.4%	83.5%	97.1%	90.0%
3-5	73.3%	71.6%	87.8%	86.7%	80.7%
4-0	73.1%	84.9%	86.4%	93.2%	92.7%
5-1	91.8%	96.3%	91.7%	97.4%	97.8%
5-2	95.7%	90.9%	82.7%	92.3%	96.8%
6-0	98.3%	87.2%	95.1%	96.1%	91.9%
7-0	83.2%	85.3%	80.2%	92.2%	87.9%
8-1	89.1%	90.7%	82.5%	93.8%	95.2%
8-2	91.5%	88.9%	97.0%	90.9%	81.3%
9-1	86.7%	85.4%	79.7%	89.5%	90.0%
9-2	85.1%	91.0%	93.1%	94.4%	90.6%
9-3	67.9%	87.7%	80.0%	87.3%	89.4%
10-0	84.8%	77.3%	89.6%	90.1%	93.8%
State	80.2%	84.6%	82.0%	90.9%	88.3%

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

As shown in Table 14, 2003 district immunization rates for the Hib vaccine varied between 72.5 and 97.8 percent. The statewide Hib coverage rate in 2003 was 87.3 percent, a decrease from the 2002 statewide rate of 90.9 percent.

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

District	1998-99 Rates 3 Hib	1999-00 Rates 3 Hib	2001 Rates 3 Hib	2002 Rates 3 Hib	2003 Rates 3 Hib
1-1	90.8%	76.5%	89.2%	91.5%	84.1%
1-2	88.0%	86.3%	95.2%	86.1%	90.8%
2-0	73.1%	88.5%	96.3%	96.1%	93.6%
3-1	71.6%	85.0%	83.9%	91.2%	82.1%
3-2	65.2%	79.9%	45.5%	85.4%	72.5%
3-3	93.5%	79.8%	81.4%	80.2%	88.4%
3-4	70.4%	97.5%	92.4%	96.6%	90.0%
3-5	76.7%	77.0%	89.3%	86.2%	76.0%
4-0	81.0%	88.5%	88.3%	93.2%	87.3%
5-1	94.1%	96.3%	91.7%	97.4%	97.8%
5-2	98.0%	96.4%	84.5%	92.7%	91.3%
6-0	98.3%	87.2%	97.5%	97.1%	93.5%
7-0	85.4%	85.3%	82.6%	89.7%	85.7%
8-1	94.6%	92.5%	81.6%	94.6%	95.2%
8-2	90.8%	92.8%	92.5%	92.2%	81.3%
9-1	86.0%	91.5%	81.3%	90.8%	87.3%
9-2	93.4%	95.5%	95.4%	93.3%	86.2%
9-3	78.0%	89.0%	81.1%	91.5%	89.4%
10-0	87.7%	79.9%	94.2%	86.8%	95.7%
State	83.6%	87.4%	84.3%	90.9%	87.3%

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 2003, the district coverage rates varied from a low of 74.6 percent to 96.7 percent. The 2003 statewide rate of 87.8 percent for the Hepatitis B vaccine was lower than the 2002 statewide rate of 90.8 percent.

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

District	1998-99 Rates 3 Hep B	1999-00 Rates 3 Hep B	2001 Rates 3 Hep B	2002 Rates 3 Hep B	2003 Rates 3 Hep B
1-1	88.0%	76.5%	92.8%	91.0%	83.4%
1-2	86.3%	86.3%	93.2%	87.3%	90.8%
2-0	73.1%	89.3%	95.6%	97.4%	93.6%
3-1	72.1%	85.5%	82.8%	92.6%	86.2%
3-2	62.8%	79.4%	44.4%	84.7%	74.6%
3-3	92.8%	76.2%	81.4%	80.2%	88.8%
3-4	72.2%	97.5%	86.1%	94.9%	90.0%
3-5	73.6%	77.9%	88.8%	85.6%	78.0%
4-0	81.0%	85.9%	88.8%	92.5%	92.7%
5-1	89.4%	96.3%	93.3%	96.2%	96.7%
5-2	97.7%	89.1%	83.6%	93.1%	93.7%
6-0	98.9%	85.1%	93.2%	96.1%	95.1%
7-0	84.7%	87.6%	85.0%	90.5%	87.9%
8-1	91.3%	92.5%	84.5%	94.6%	96.0%
8-2	90.8%	90.2%	95.5%	92.2%	82.0%
9-1	84.6%	89.2%	76.4%	90.1%	79.3%
9-2	91.7%	91.7%	95.4%	92.1%	87.7%
9-3	81.7%	87.7%	81.1%	89.0%	86.2%
10-0	87.7%	79.9%	91.6%	88.4%	95.1%
State	82.9%	86.7%	83.8%	90.8%	87.8%

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 71.7 percent to 96.8 percent, with a statewide coverage rate of 86.7 percent for the Varicella vaccine. This is a decrease from the 2002 Varicella rate of 88.5 percent.

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

District	1998-99 Rates 1 Varicella	1999-00 Rates 1 Varicella	2001 Rates 1 Varicella	2002 Rates 1 Varicella	2003 Rates 1 Varicella
1-1	41.5%	45.2%	83.7%	89.1%	86.8%
1-2	48.0%	58.2%	82.9%	86.1%	90.2%
2-0	48.4%	81.7%	94.8%	96.1%	96.8%
3-1	43.2%	66.3%	72.4%	88.4%	80.7%
3-2	43.1%	67.5%	44.4%	81.9%	71.7%
3-3	80.6%	52.4%	69.5%	82.9%	84.7%
3-4	54.2%	89.5%	86.1%	96.0%	90.0%
3-5	51.0%	57.2%	81.1%	83.6%	74.0%
4-0	31.7%	65.6%	83.0%	92.5%	92.7%
5-1	21.2%	61.3%	86.7%	84.6%	95.6%
5-2	63.7%	61.8%	80.0%	90.3%	92.9%
6-0	75.3%	61.7%	88.3%	97.1%	90.2%
7-0	24.1%	53.5%	74.9%	88.8%	85.7%
8-1	30.4%	61.7%	78.6%	93.0%	94.4%
8-2	71.8%	66.0%	96.2%	90.9%	78.0%
9-1	18.9%	51.5%	71.5%	83.6%	83.3%
9-2	27.3%	58.6%	88.5%	87.6%	91.3%
9-3	25.7%	57.5%	69.5%	83.9%	86.2%
10-0	52.0%	58.4%	87.0%	86.8%	95.7%
State	47.1%	64.3%	77.9%	88.5%	86.7%

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

Statewide Comparisons of Maternal Demographics of Adequately Immunized Children

Cross-tabulations were performed at the state level in order to describe the relationship between maternal characteristics and the immunization status of two-year-old children. Tables 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 the 1998-99, 2001 and 2002 study years the immunization rates of children born to black and white mothers were virtually the same. However, in the 2003 study maternal race was a significant factor in the immunization status of two-year-old children in Georgia.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	1654/2265 (73.0)	1265/1661 (76.2)	1410/1664 (84.7)	1221/1560 (78.3)
Black	806/1122 (71.8)	765/1045 (73.2)	806/978 (82.4)	661/940 (70.3)
Other	51/73 (69.9)	38/49 (77.6)	64/79 (81.0)	53/67 (79.1)
4:3:1 Total	73.3%	75.1%	83.9%	80.8%

Notes: Total rates based on data weighted by health district.
 1998-99 Chi-square=2.61, p=0.45; 1999-00 Analysis not done; 2001 Chi-square=3.15, p=0.21; 2002 Chi-square=3.81, p=0.28; 2003 Chi-square=20.49, p<.05.

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 2002 and 2003, maternal educational attainment was associated with child immunization status. As the mother's education level increased, the child's immunization rate increased as well.

Table 18:
**Statewide Cross tabulations of Maternal Educational Attainment
and Child Immunization Status by Study Year**

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Education	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	135/176 (76.7)	161/221 (72.9)	124/157 (79.0)	25/33 (75.8)
Some high school	472/662 (71.3)	456/595 (76.6)	455/561 (81.1)	297/408 (72.8)
High school	866/1,189 (72.8)	724/960 (75.4)	752/914 (82.3)	619/856 (72.1)
Some college	493/679 (72.6)	364/485 (75.1)	415/498 (83.3)	380/495 (76.8)
College or higher	545/754 (72.3)	363/494 (73.5)	538/591 (91.0)	614/775 (79.2)
4:3:1 Total	73.3%	75.1%	83.9%	80.8%

Notes: Total rates based on data weighted by health district. 1998-99 Chi-square=2.12, p=0.71; 1999-00 Analysis not done; 2001 Chi-square=2.09, p=0.7; 2002 Chi-square=31.97, p<0.05; 2003 Chi -square=12.50, p<.05.

Table 19 shows the statewide cross-tabulation of maternal Medicaid status and 4:3:1 immunization status for 2001, 2002 and 2003 study years. The 4:3:1 rates are shown for Medicaid recipients and non-Medicaid recipients. During the 2002 and 2003 study years, statewide immunization rates were significantly higher for Non-Medicaid recipients (Chi-square=15.34, p=0.00009 and Chi-square=17.45, p < .05, respectively).

Table 19:
2003 Statewide Cross tabulations
of Maternal Medicaid Status and Child Immunization Status

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	1,024/1,357 (75.5)	1,054/1,300 (81.1)	991/1,375 (72.1)
Non-Medicaid	1,044/1,398 (74.7)	1,230/1,421 (86.6)	944/1,192 (79.2)
4:3:1 Total	75.1%	83.9%	80.8%

Notes: 4:3:1 total rates based on data weighted by health district. 2001 Chi-square = 0.23, p = 0.64; 2002 Chi-square = 15.13, p<0.05; 2003 Chi-square = 17.45, p <.05.

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 2003 statewide compared to the same rates as measured by this study in 2002.

SECTION IV:
RESULTS OF DISTRICT LEVEL
ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

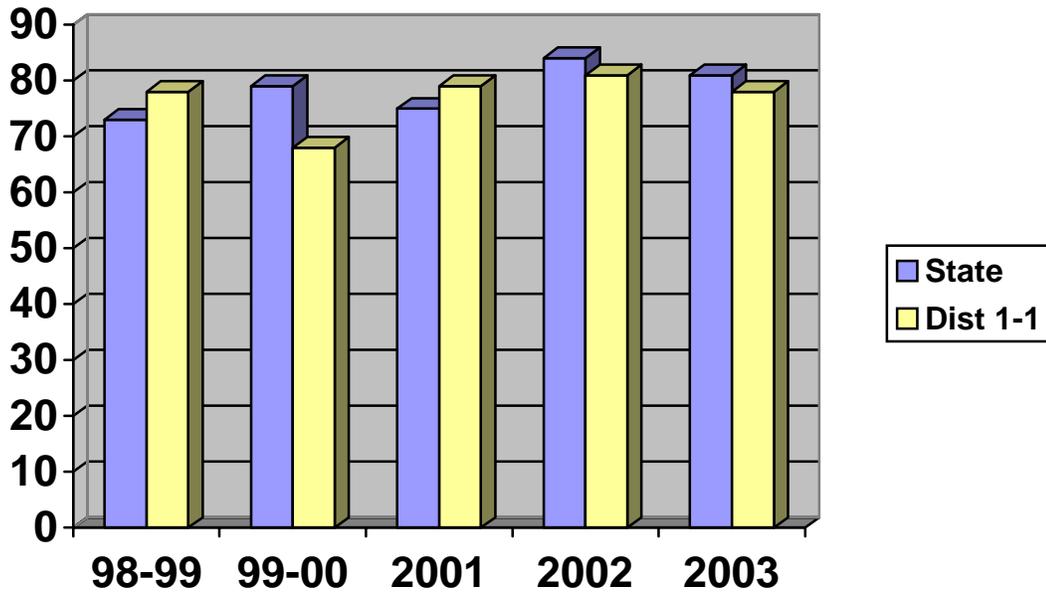
The immunization rates for this sixth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: Response Rates for the 2002 Georgia Immunization Study. The rates reported are based on information collected from both public and private providers. Summaries of all district rates are included in Section III: Statewide Rates, specifically Tables 10-16. The Individual District Reports include immunization rates for each recommended vaccine and 4:3:1 rates. Although statistical analyses would be informative for each of the districts, sub-category sample sizes in the cross tabulation tables were too small for such analyses to be interpreted and generalized to the target population.

Individual Health District Report: District 1-1

The eligible sample from this district included 198 children born in January 2001. From the 198 children, 155 records were located (Response Rate=78.3%). Of the 155 located records, there were 4 parental refusals leaving a final sample of 151 records.

- ❖ **The 4:3:1 immunization coverage estimate is 77.5 percent (117/151).**
This rate is lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 66.9 percent (101/151).**
This rate is lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 20:
District Immunization Rates for
Health District 1-1 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	78.2%	67.5%	79.5%	81.1%	77.5%
3 OPV/IPV	90.8%	82.2%	88.6%	90.0%	84.8%
1 MMR	86.6%	73.5%	89.2%	90.5%	88.1%
3 Hib	90.8%	76.5%	89.2%	91.5%	84.1%
3 HepB	88.0%	76.5%	92.8%	91.0%	83.4%
1 Varicella	41.5%	45.2%	83.7%	89.1%	86.8%

Table 20 reveals the coverage rates of each vaccine series. Coverage rates ranged from 77.5 to 88.1 percent for the 2003 study data.

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

Table 21:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	146	96.7%
DTP2/DTaP2	137	90.7%
DTP3/DTaP3	121	80.1%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	144	95.4%
OPV/IPV2	136	90.1%
OPV/IPV3	59	39.1%
OPV/IPV4	0	0.0%
MMR1	4	2.6%
MMR2	0	0.0%
HIB1	145	96.0%
HIB2	137	90.7%
HIB3	52	34.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	145	96.0%
HEPB2	138	91.4%
HEPB3	53	35.1%
HEPB4	1	0.7%
VAR1	7	4.6%
VAR2	0	0.0%

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

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

	1998-99	2001	2002	2003
	4:3:1	4:3:1	4:3:1	4:3:1:
	Adequate	Adequate	Adequate	Adequate
Maternal Race	#/Total	#/Total	#/Total	#/Total
	(percent)	(percent)	(percent)	(percent)
White	99/129 (76.7)	123/154 (79.9)	140/174 (80.5)	96/135 (71.1)
Black	11/12 (91.7)	8/12 (66.7)	19/23 (82.6)	9/16 (56.3)
Other	1/1 (100.0)	----	3/3 (100.0)	----
Total	111/142 (78.2)	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)

* 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 1998-99 and 2002 the 4:3:1 immunization rate of children born to black mothers was higher than that of children born to white mothers in the district. However, in 2001 and 2003 the immunization rate of children born to white mothers was higher than that of black mothers.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/13 (69.2)	14/15 (93.3)	9/14 (64.3)	2/2 (100.0)
Some high school	23/34 (67.6)	29/41 (70.7)	36/50 (72.0)	18/25 (72.0)
High school graduate	43/52 (82.7)	41/52 (78.8)	66/79 (83.5)	25/43 (58.1)
Some college	23/28 (82.1)	27/35 (77.1)	29/35 (82.9)	24/31 (77.4)
College or more	13/15 (86.7)	20/23 (87.0)	19/20 (95.0)	36/50 (72.0)
Unknown	---	---	3/3 (100.0)	---
Total	111/142 (78.2)	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)

*Excludes 1999-00 study year.

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

- ❖ For the 2003 study, immunization rates varied with educational attainment.

Table 24:
**Cross tabulations of Maternal Medicaid Status and
 Child Immunization Status for Health District 1-1**

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	62/80 (77.5)	79/99 (79.8)	49/78 (62.8)
Non-Medicaid	69/86 (80.2)	83/102 (81.4)	56/73 (76.7)
Total	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)

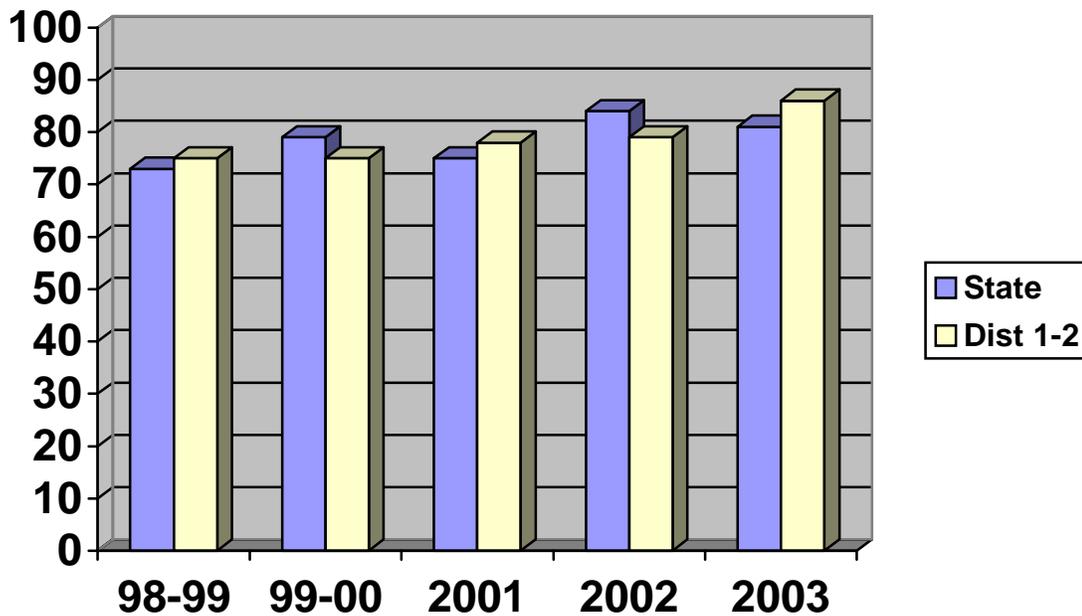
Table 24 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 1-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 1-2

The eligible sample from this district included 172 children born in January 2001. From these children, 165 records were located (Response Rate=95.9%). Of the 165 located records, there were 12 parental refusals leaving a final sample of 153 records.

- ❖ **4:3:1 immunization coverage estimate is 85.6 percent (131/153).** This rate is higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **4:3:1+3 immunization coverage estimate 81.7 percent (125/153).** This rate is higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 25:
District Immunization Rates for
Health District 1-2 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	75.4%	77.4%	79.5%	82.3%	86.3%
3 OPV/IPV	86.9%	82.2%	86.3%	85.4%	88.9%
1 MMR	84.6%	83.6%	85.6%	87.3%	90.8%
3 Hib	88.0%	86.3%	95.2%	86.1%	90.8%
3 HepB	86.3%	86.3%	93.2%	87.3%	90.8%
1 Varicella	48.0%	58.2%	82.9%	86.1%	90.2%

Table 25 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 86.3 to 90.8 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 1-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	149	97.4%
DTP2/DTaP2	147	96.1%
DTP3/DTaP3	134	87.6%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	148	96.7%
OPV/IPV2	144	94.1%
OPV/IPV3	64	41.8%
OPV/IPV4	0	0.0%
MMR1	4	2.6%
MMR2	0	0.0%
HIB1	149	97.4%
HIB2	146	95.4%
HIB3	57	37.3%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	149	97.4%
HEPB2	145	94.8%
HEPB3	68	44.4%
HEPB4	0	0.0%
VAR1	14	9.2%
VAR2	0	0.0%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	125/167 (74.9)	112/142 (78.9)	118/149 (79.2)	118/145 (81.4)
Black	4/6 (66.7)	2/4 (50.0)	2/3 (66.7)	1/2 (50.0)
Other	2/2 (100.0)	---	2/2 (100.0)	4/6 (66.7)
Unknown	---	---	3/4 (75.0)	---
Total	131/175 (74.9)	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/14 (85.7)	14/20 (70.0)	10/10 (100.0)	3/3 (100.0)
Some high school	29/39 (74.4)	32/37 (86.5)	28/37 (75.7)	16/22 (72.7)
High school graduate	49/65 (75.4)	30/45 (66.7)	25/36 (69.4)	36/44 (81.8)
Some college	18/25 (72.0)	21/23 (91.3)	31/37 (83.8)	24/30 (80.0)
College or more	23/32 (71.9)	17/21 (81.0)	29/34 (85.3)	44/54 (81.5)
Unknown	----	----	2/4 (50.0)	----
Total	131/175 (74.9)	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	52/62 (83.9)	44/60 (73.3)	43/62 (69.4)
Non-Medicaid	62/84 (73.8)	81/98 (82.7)	80/91 (87.9)
Total	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)

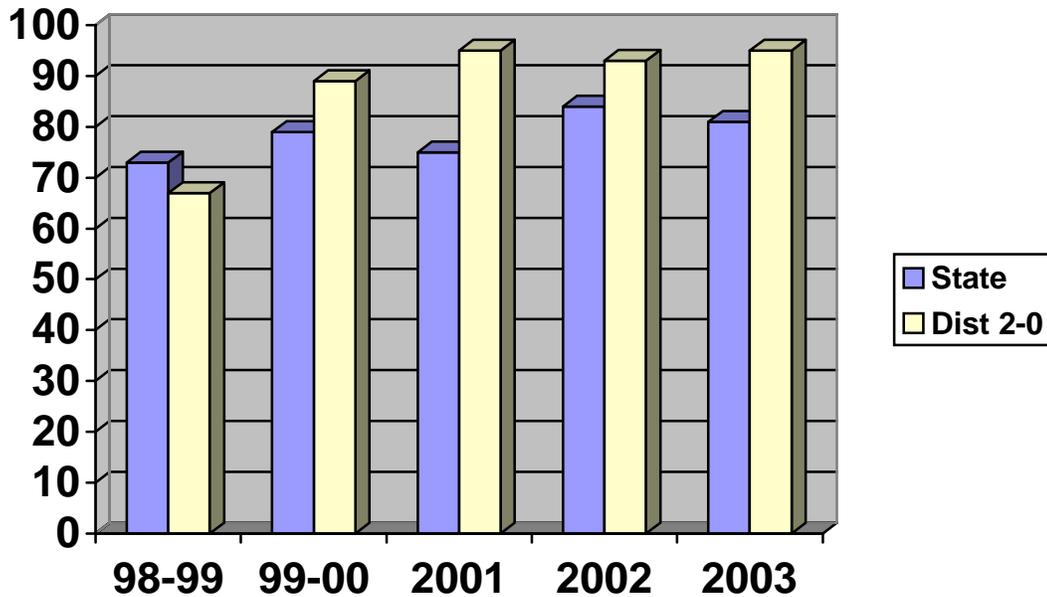
Table 29 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 1-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 2-0

The eligible sample from this district included 109 children born in January 2001. From the 109 children, 103 records were located (Response rate = 94.5%). Of the 103 located records, there were 9 parental refusals leaving a final sample of 94 records.

- ❖ **4:3:1 immunization coverage estimate is 94.7 percent (89/94).** This rate is much higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **4:3:1+3 immunization coverage estimate is 91.5 percent (86/94).** This rate is also much higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 30:
District Immunization Rates for
Health District 2-0 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	67.7%	89.3%	94.8%	94.7%	95.7%
3 OPV/IPV	73.7%	88.5%	97.0%	97.4%	94.7%
1 MMR	72.0%	90.1%	97.0%	96.1%	96.8%
3 Hib	73.1%	88.5%	96.3%	96.1%	93.6%
3 HepB	73.1%	89.3%	95.6%	97.4%	93.6%
1 Varicella	48.4%	81.7%	94.8%	96.1%	96.8%

Table 30 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 93.6 to 96.8 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 2-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	91	96.8%
DTP2/DTaP2	90	95.7%
DTP3/DTaP3	87	92.6%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	91	96.8%
OPV/IPV2	90	95.7%
OPV/IPV3	57	60.6%
OPV/IPV4	0	0.0%
MMR1	9	9.6%
MMR2	0	0.0%
HIB1	91	96.8%
HIB2	89	94.7%
HIB3	48	51.1%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	91	96.8%
HEPB2	90	95.7%
HEPB3	58	61.7%
HEPB4	0	0.0%
VAR1	7	7.4%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 94

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	114/169 (67.5)	121/127 (95.3)	65/70 (92.9)	82/91 (90.1)
Black	9/13 (69.2)	5/6 (83.3)	4/4 (100.0)	3/3 (100.0)
Other	1/4 (25.0)	2/2 (100.0)	2/2 (100.0)	---
Total	124/186 (66.7)	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	17/22 (77.3)	23/25 (92.0)	9/9 (100.0)	1/1 (100.0)
Some high school	24/41 (58.5)	24/24 (100.0)	15/18 (83.3)	11/12 (91.7)
High school graduate	38/58 (65.5)	38/42 (90.5)	20/21 (95.2)	38/41 (92.7)
Some college	21/30 (70.0)	15/16 (93.8)	7/8 (87.5)	5/7 (71.4)
College or more	24/35 (68.6)	28/28 (100.0)	17/17 (100.0)	30/33 (90.9)
Unknown	---	---	3/3 (100.0)	---
Total	124/186 (66.7)	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	48/51 (94.1)	24/28 (85.7)	49/52 (94.2)
Non-Medicaid	80/84 (95.2)	47/48 (97.9)	36/42 (85.7)
Total	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)

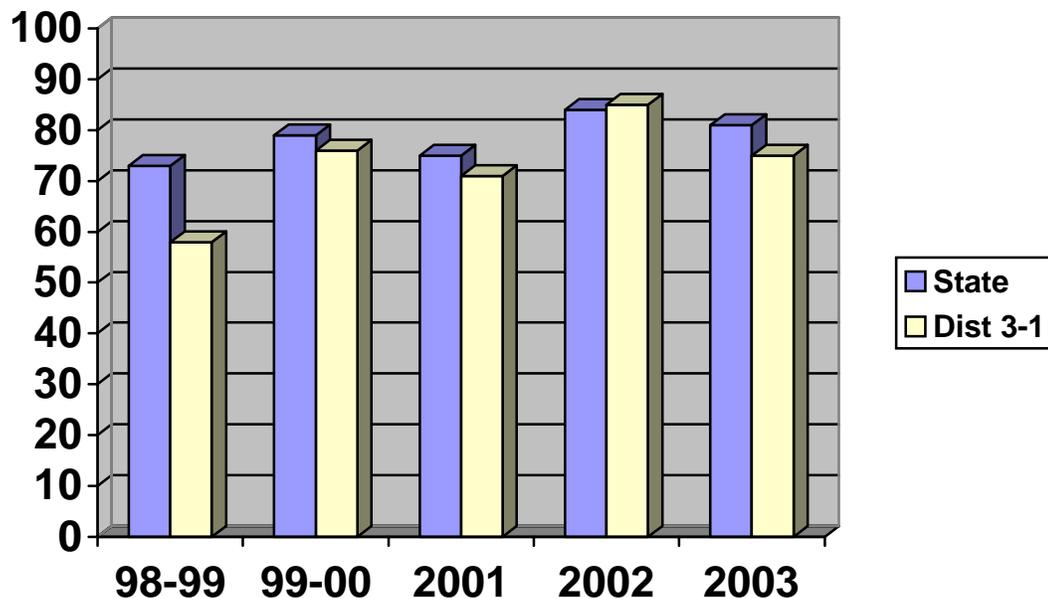
Table 34 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. During the 2001 and 2002 study years, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid. However, in 2003 children born to Medicaid women had a higher immunization rate than children born to non-Medicaid women.

Individual Health District Report: District 3-1

The eligible sample from this district included 221 children born in January 2001. From the 221 children, 152 records were located (Response Rate=68.8%). Of the 152 located records, there were 7 parental refusals leaving a final sample of 145 records.

- ❖ **The 4:3:1 immunization coverage estimate is 75.2 percent (109/145).**
This rate is lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 72.4 percent (105/145).**
This rate is lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 35:
District Immunization Rates for
Health District 3-1 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	59.0%	77.7%	70.7%	84.9%	76.6%
3 OPV/IPV	72.5%	79.3%	75.3%	90.8%	83.4%
1 MMR	64.0%	81.9%	77.0%	90.1%	80.7%
3 Hib	71.6%	85.0%	83.9%	91.2%	82.1%
3 HepB	72.1%	85.5%	82.8%	92.6%	86.2%
1 Varicella	43.2%	66.3%	72.4%	88.4%	80.7%

Table 35 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 76.6 to 86.2 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-1**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	133	91.7%
DTP2/DTaP2	127	87.6%
DTP3/DTaP3	120	82.8%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	133	91.7%
OPV/IPV2	127	87.6%
OPV/IPV3	54	37.2%
OPV/IPV4	1	0.7%
MMR1	10	6.9%
MMR2	0	0.0%
HIB1	132	91.0%
HIB2	126	86.9%
HIB3	62	42.8%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	133	91.7%
HEPB2	130	89.7%
HEPB3	79	54.5%
HEPB4	0	0.0%
VAR1	14	9.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 145

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	101/172 (58.7)	95/128 (74.2)	179/207 (86.5)	84/108 (77.8)
Black	25/45 (55.6)	22/40 (55.0)	51/66 (77.3)	21/35 (60.0)
Other	3/5 (60.0)	6/6 (100.0)	8/9 (88.9)	1/2 (50.0)
Unknown	---	---	2/2 (100.0)	---
Total	129/222 (58.1)	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/10 (70.0)	7/16 (43.8)	17/26 (65.4)	3/3 (100.0)
Some high school	10/22 (45.5)	17/23 (73.9)	21/28 (75.0)	7/10 (70.0)
High school graduate	32/68 (47.1)	41/53 (77.4)	60/74 (81.1)	25/38 (65.8)
Some college	26/47 (55.3)	22/34 (64.7)	38/46 (82.6)	14/23 (60.9)
College or more	54/75 (72.0)	36/48 (75.0)	99/105 (94.3)	57/71 (80.3)
Unknown	---	---	5/5 (100.0)	---
Total	129/222 (58.1)	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	39/61 (63.9)	58/79 (73.4)	21/35 (60.0)
Non-Medicaid	84/113 (74.3)	182/205 (88.8)	85/110 (77.3)
Total	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)

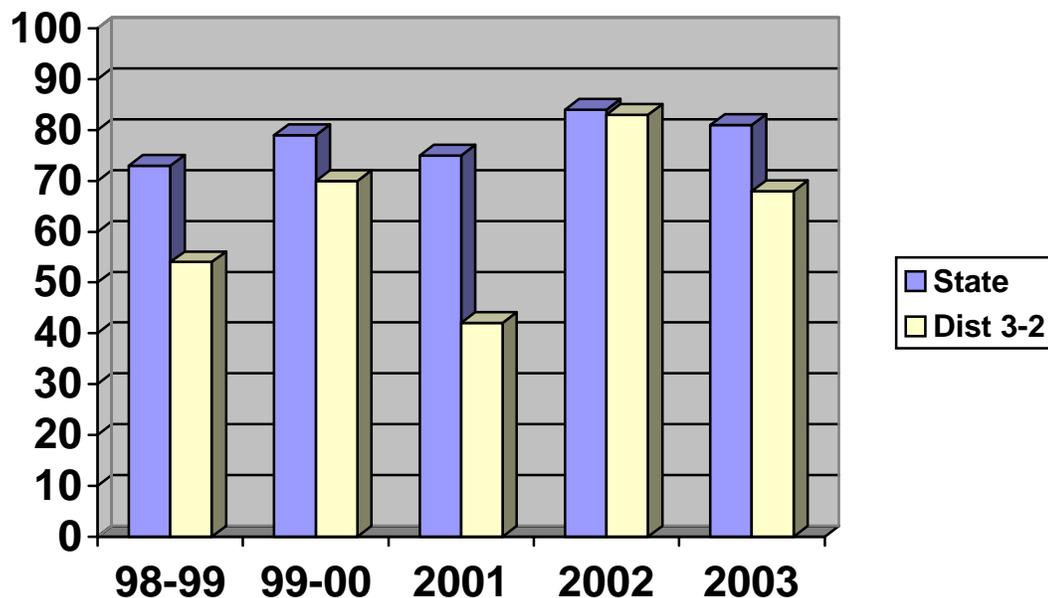
Table 39 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 3-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-2

The eligible sample from this district included 487 children born in January 2001. From the 487 children, 176 records were located (Response Rate=36.1%). Of the 176 located records, there were 38 parental refusals leaving a final sample of 138 records.

- ❖ **The 4:3:1 immunization coverage estimate is 68.1 percent (94/138).**
This rate is much lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 65.9 percent (91/138).**
This rate is also much lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 40:
District Immunization Rates for
Health District 3-2 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	55.1%	71.1%	42.4%	84.0%	68.1%
3 OPV/IPV	64.9%	76.8%	45.5%	84.7%	71.7%
1 MMR	65.8%	77.8%	45.1%	84.7%	71.0%
3 Hib	65.2%	79.9%	45.5%	85.4%	72.5%
3 HepB	62.8%	79.4%	44.4%	84.7%	74.6%
1 Varicella	43.1%	67.5%	44.4%	81.9%	71.7%

Table 40 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 68.1 to 74.6 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	115	83.3%
DTP2/DTaP2	109	79.0%
DTP3/DTaP3	98	71.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	115	83.3%
OPV/IPV2	109	79.0%
OPV/IPV3	58	42.0%
OPV/IPV4	0	0.0%
MMR1	4	2.9%
MMR2	0	0.0%
HIB1	115	83.3%
HIB2	108	78.3%
HIB3	67	48.6%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	116	84.1%
HEPB2	113	81.9%
HEPB3	69	50.0%
HEPB4	0	0.0%
VAR1	10	7.2%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 138

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	95/153 (62.1)	66/148 (44.6)	69/79 (87.3)	50/76 (65.8)
Black	77/161 (47.8)	58/143 (40.6)	48/61 (78.7)	31/59 (52.5)
Other	3/11 (27.3)	2/6 (33.3)	2/3 (66.7)	3/3 (100.0)
Total	175/325 (53.8)	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	10/22 (45.5)	16/30 (53.3)	7/9 (77.8)	3/3 (100.0)
Some high school	23/53 (43.4)	24/47 (51.1)	15/20 (75.0)	7/14 (50.0)
High school graduate	41/77 (53.2)	25/69 (36.2)	20/26 (76.9)	16/27 (59.3)
Some college	32/51 (62.7)	15/37 (40.5)	22/28 (78.6)	7/21 (33.3)
College or more	69/122 (56.6)	46/114 (40.4)	50/55 (90.9)	51/73 (69.9)
Unknown	---	---	5/6 (83.3)	---
Total	175/325 (53.8)	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	41/93 (44.1)	37/48 (77.1)	32/67 (47.8)
Non-Medicaid	85/204 (41.7)	82/96 (85.4)	52/71 (73.2)
Total	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)

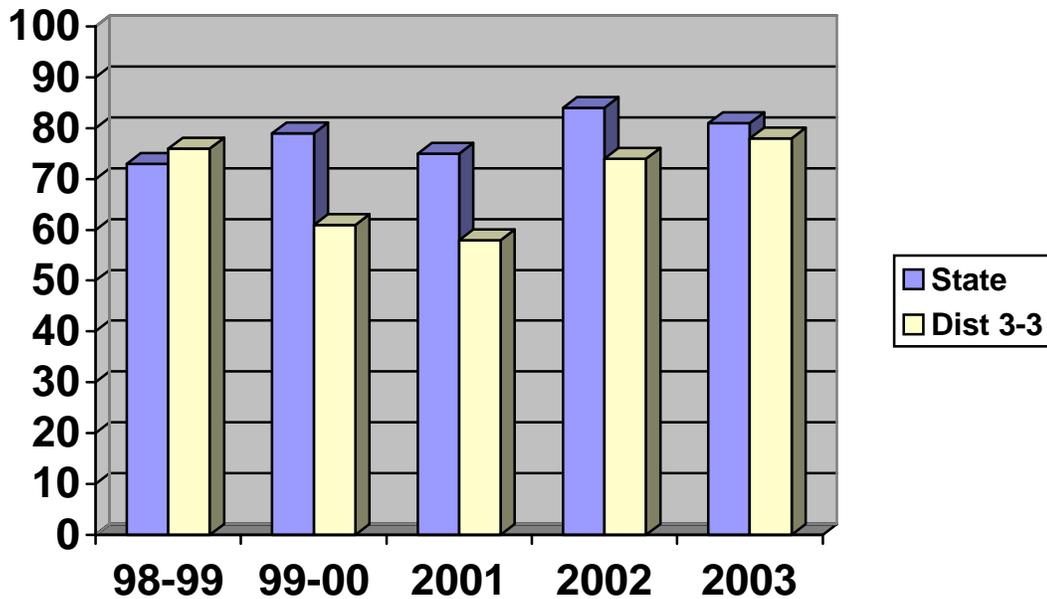
Table 44 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 3-2, immunization status of the children in the sample varied with maternal Medicaid status.

Individual Health District Report: District 3-3

The eligible sample from this district included 344 children born in January 2001. From the 344 children, 272 records were located (Response Rate=78.8%). Of the 272 located records, there were 3 parental refusals leaving a final sample of 269 records.

- ❖ **The 4:3:1 immunization coverage estimate is 78.4 percent (211/269).**
This rate is lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 74.6 percent (201/269).**
This rate is almost the same as the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 45:
District Immunization Rates for
Health District 3-3 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	76.3%	63.1%	61.0%	73.9%	79.1%
3 OPV/IPV	93.5%	71.4%	69.5%	82.9%	85.8%
1 MMR	84.9%	70.2%	74.6%	84.7%	85.1%
3 Hib	93.5%	79.8%	81.4%	80.2%	88.4%
3 HepB	92.8%	76.2%	81.4%	80.2%	88.8%
1 Varicella	80.6%	52.4%	69.5%	82.9%	84.7%

Table 45 reveals the coverage rates of each vaccine series. Coverage rates ranged from 79.1 to 88.8 percent.

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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	262	97.8%
DTP2/DTaP2	250	93.3%
DTP3/DTaP3	229	85.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	262	97.8%
OPV/IPV2	245	91.4%
OPV/IPV3	108	40.3%
OPV/IPV4	0	0.0%
MMR1	12	4.5%
MMR2	0	0.0%
HIB1	261	97.4%
HIB2	250	93.3%
HIB3	171	63.8%
HIB4	2	0.7%
HIB5	0	0.0%
HEPB1	261	97.4%
HEPB2	251	93.7%
HEPB3	181	67.5%
HEPB4	2	0.7%
VAR1	12	4.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 268

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	52/71 (73.2)	27/49 (55.1)	40/52 (76.9)	75/104 (72.1)
Black	49/62 (79.0)	39/67 (58.2)	38/54 (70.4)	103/142 (72.5)
Other	5/6 (83.3)	2/2 (100.0)	3/4 (75.0)	20/23 (87.0)
Unknown	---	---	1/1 (100.0)	---
Total	106/139 (76.3)	68/118 (57.6)	82/111 (73.9)	198/269 (73.6)

*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 status of the children in the sample in District 3-3 varied with maternal race.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/4 (100.0)	1/4 (25.0)	12/13 (92.3)	4/6 (66.7)
Some high school	21/27 (77.8)	17/31 (54.8)	10/18 (55.6)	28/40 (70.0)
High school graduate	36/51 (70.6)	31/48 (64.6)	25/36 (69.4)	57/85 (67.1)
Some college	27/35 (77.1)	15/26 (57.7)	17/21 (81.0)	52/62 (83.9)
College or more	18/22 (81.8)	4/9 (44.4)	16/20 (80.0)	57/76 (75.0)
Unknown	---	---	2/3 (66.7)	---
Total	106/139 (76.3)	68/118 (57.6)	82/111 (73.8)	198/269 (73.6)

*Excludes 1999-00 study year.

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

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

Table 49:
**Cross tabulations of Maternal Medicaid Status and
 Child Immunization Status for Health District 3-3**

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	42/71 (59.2)	41/58 (70.7)	92/127 (72.4)
Non-Medicaid	26/47 (55.3)	41/53 (77.4)	106/142 (74.6)
Total	68/118 (57.6)	82/111 (73.9)	198/269 (73.6)

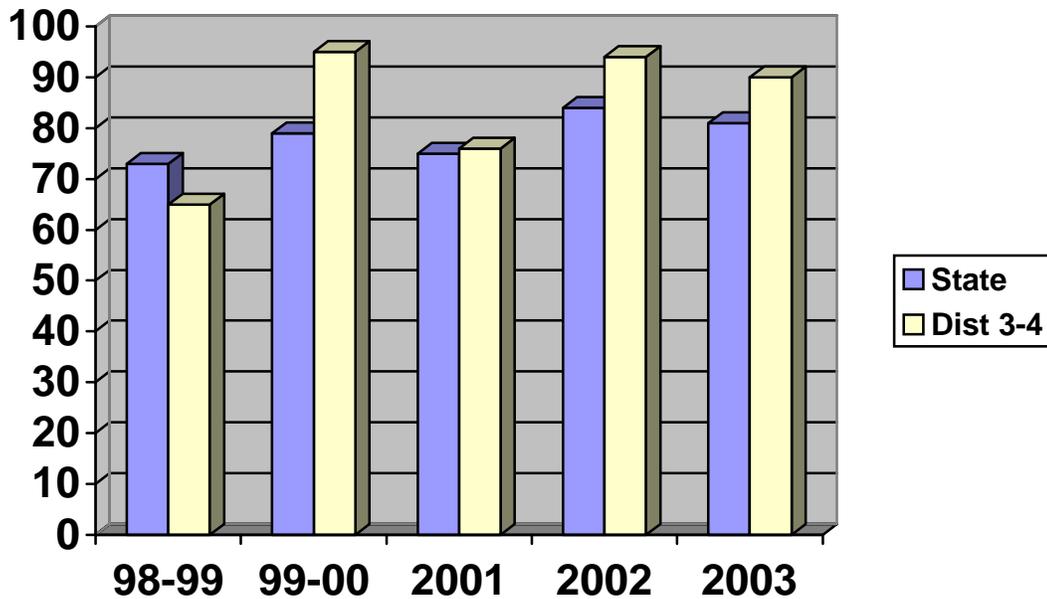
Table 49 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 3-3, immunization status of the children in the sample varied with maternal Medicaid status.

Individual Health District Report: District 3-4

The eligible sample from this district included 89 children born in January 2001. From the 89 children, 65 records were located (Response Rate=73.0%). Of the 65 located records, there were 5 parental refusals leaving a final sample of 60 records.

- ❖ **The 4:3:1 immunization coverage estimate is 90.0 percent (54/60).** This rate is higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 83.3 percent (50/60).** This rate is higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 50:
District Immunization Rates for
Health District 3-4 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	66.4%	94.8%	75.9%	94.9%	90.0%
3 OPV/IPV	72.9%	96.4%	77.2%	96.0%	90.0%
1 MMR	69.7%	96.4%	83.5%	97.1%	90.0%
3 Hib	70.4%	97.5%	92.4%	96.6%	90.0%
3 HepB	72.2%	97.5%	86.1%	94.9%	90.0%
1 Varicella	54.2%	89.5%	86.1%	96.0%	90.0%

Table 50 reveals the coverage rates of each vaccine series. Vaccine coverage rates were 90.0 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-4**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	54	90.0%
DTP2/DTaP2	54	90.0%
DTP3/DTaP3	53	88.3%
DTP4/DTaP4	1	1.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	54	90.0%
OPV/IPV2	54	90.0%
OPV/IPV3	21	35.0%
OPV/IPV4	0	0.0%
MMR1	2	3.3%
MMR2	0	0.0%
HIB1	54	90.0%
HIB2	54	90.0%
HIB3	29	48.3%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	54	90.0%
HEPB2	53	88.3%
HEPB3	25	41.7%
HEPB4	1	1.7%
VAR1	2	3.3%
VAR2	0	0.0%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	155/241 (64.3)	43/56 (76.8)	122/127 (96.1)	37/42 (88.1)
Black	14/24 (58.3)	12/17 (70.6)	30/35 (85.7)	10/12 (83.3)
Other	11/12 (91.7)	5/6 (83.3)	11/11 (100.0)	5/6 (83.3)
Unknown	---	---	2/2 (100.0)	---
Total	180/277 (65.0)	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)

*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 all study years represented, the immunization rates of children born to white mothers was greater than that of black mothers.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
Less than high school	5/6 (83.3)	2/3 (66.7)	4/5 (80.0)	1/1 (100.0)
Some high school	16/22 (72.7)	7/11 (63.6)	15/18 (83.3)	3/3 (100.0)
High school graduate	47/71 (66.2)	16/25 (64.0)	58/61 (95.1)	17/21 (81.0)
Some college	45/74 (60.8)	8/10 (80.0)	27/29 (93.1)	9/10 (90.0)
College or more	67/104 (64.4)	27/30 (90.0)	55/56 (98.2)	22/25 (88.0)
Unknown	---	---	6/6 (100.0)	---
Total	180/277 (65.0)	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	13/24 (54.2)	41/46 (89.1)	17/19 (89.5)
Non-Medicaid	47/55 (85.5)	124/129 (96.1)	35/41 (85.4)
Total	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)

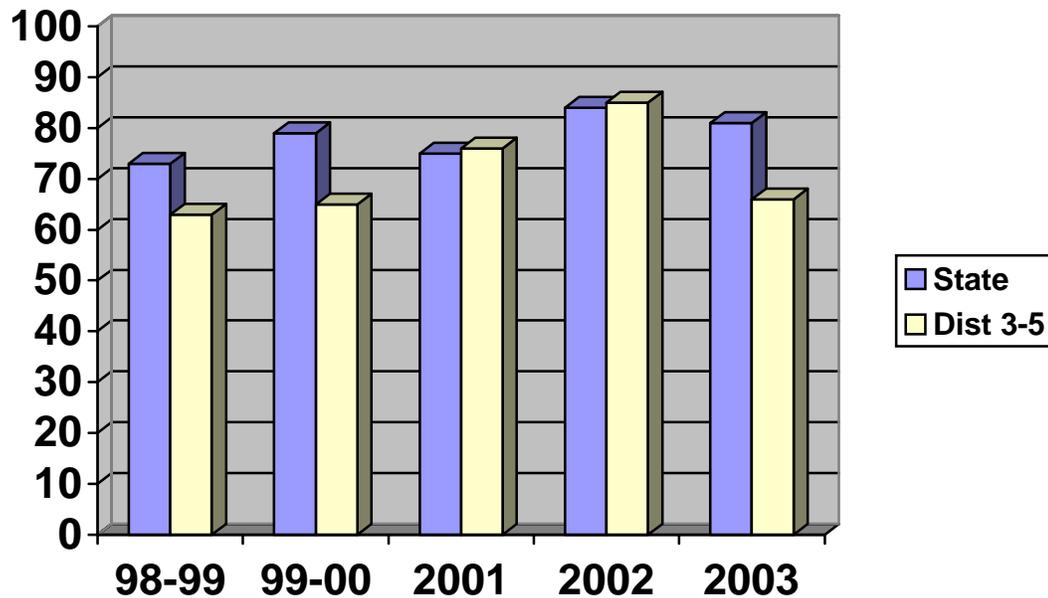
Table 54 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. In the 2003 study, children born to Medicaid women had a higher immunization rate than children born to women using non-Medicaid.

Individual Health District Report: District 3-5

The eligible sample from this district included 270 children born in January 2001. From the 270 children, 152 records were located (Response Rate=56.3%). Of the 152 located records, there were 2 parental refusals leaving a final sample of 150 records.

- ❖ **The 4:3:1 immunization coverage estimate is 66.0 percent (99/150).** This rate is much lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 58.7 percent (88/150).** This rate is also much lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 55:
District Immunization Rates for
Health District 3-5 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	64.4%	66.2%	77.0%	84.6%	66.0%
3 OPV/IPV	76.4%	75.7%	83.7%	88.7%	82.0%
1 MMR	73.3%	71.6%	87.8%	86.7%	80.7%
3 Hib	76.7%	77.0%	89.3%	86.2%	76.0%
3 HepB	73.6%	77.9%	88.8%	85.6%	78.0%
1 Varicella	51.0%	57.2%	81.1%	83.6%	74.0%

Table 55 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 66.0 to 82.0 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-5

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	134	89.3%
DTP2/DTaP2	130	86.7%
DTP3DTaP3	123	82.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	134	89.3%
OPV/IPV2	128	85.3%
OPV/IPV3	58	38.7%
OPV/IPV4	0	0.0%
MMR1	4	2.7%
MMR2	0	0.0%
HIB1	132	88.0%
HIB2	124	82.7%
HIB3	58	38.7%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	135	90.0%
HEPB2	128	85.3%
HEPB3	57	38.0%
HEPB4	1	0.7%
VAR1	7	4.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 150

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
White	78/111 (70.3)	38/52 (73.1)	51/63 (81.0)	36/45 (80.0)
Black	94/166 (56.6)	100/130 (76.9)	101/117 (86.3)	53/100 (53.0)
Other	12/15 (80.0)	10/14 (71.4)	9/10 (90.0)	2/5 (40.0)
Unknown	---	---	4/5 (80.0)	---
Total	184/292 (63.0)	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)

*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 in District 3-5 varied with maternal race with no clear trend emerging.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	8/11 (72.7)	12/17 (70.6)	11/15 (73.3)	2/5 (40.0)
Some high school	19/36 (52.8)	17/25 (68.0)	19/22 (86.4)	9/13 (69.2)
High school graduate	47/84 (56.0)	43/59 (72.9)	40/48 (83.3)	22/42 (52.4)
Some college	30/56 (53.6)	33/46 (71.7)	38/49 (77.6)	21/39 (53.8)
College or more	80/105 (76.2)	43/49 (87.8)	51/54 (94.4)	37/51 (72.5)
Unknown	---	---	6/7 (85.7)	---
Total	184/292 (63.0)	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	69/98 (70.4)	66/82 (80.5)	36/72 (50.0)
Non-Medicaid	79/98 (80.6)	99/113 (87.6)	55/78 (70.5)
Total	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)

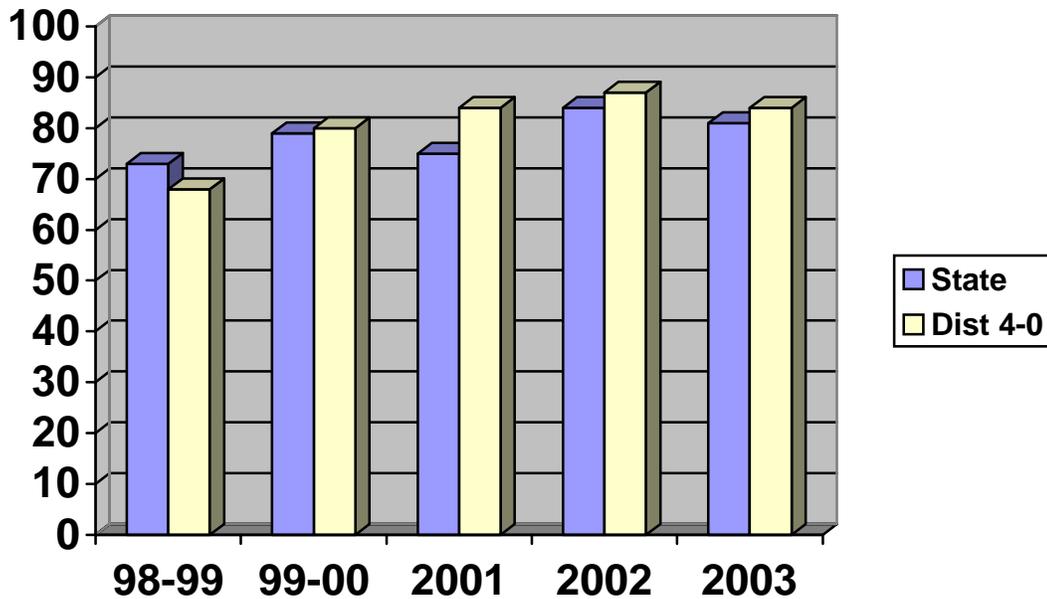
Table 59 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 3-5, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 4-0

The eligible sample from this district included 180 children born in January 2001. From the 180 children, 119 records were located (Response Rate=66.1%). Of the 119 located records, there were 9 parental refusals leaving a final sample of 110 records.

- ❖ **The 4:3:1 immunization coverage estimate is 83.6 percent (92/110).** This rate is higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 79.1 percent (87/110).** This rate is higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 60:
District Immunization Rates for
Health District 4-0 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	69.0%	79.7%	83.5%	87.8%	84.5%
3 OPV/IPV	80.2%	85.9%	86.4%	92.5%	92.7%
1 MMR	73.1%	84.9%	86.4%	93.2%	92.7%
3 Hib	81.0%	88.5%	88.3%	93.2%	87.3%
3 HepB	81.0%	85.9%	88.8%	92.5%	92.7%
1 Varicella	31.7%	65.6%	83.0%	92.5%	92.7%

Table 60 reveals the coverage rates of each vaccine series. Coverage rates ranged from 84.5 to 92.7 percent for the 2003 study data.

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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	107	97.3%
DTP2/DTaP2	103	93.6%
DTP3/DTaP3	94	85.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	107	97.3%
OPV/IPV2	103	93.6%
OPV/IPV3	45	40.9%
OPV/IPV4	0	0.0%
MMR1	3	2.7%
MMR2	0	0.0%
HIB1	105	95.5%
HIB2	102	92.7%
HIB3	53	48.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	107	97.3%
HEPB2	106	96.4%
HEPB3	64	58.2%
HEPB4	1	0.9%
VAR1	3	2.7%
VAR2	0	0.0%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	132/203 (65.0)	115/138 (83.3)	89/99 (89.9)	57/68 (83.8)
Black	47/63 (74.6)	54/65 (83.1)	39/47 (83.0)	29/42 (69.0)
Other	2/2 (100)	3/3 (100.0)	0/1 (0.0)	---
Total	181/268 (67.5)	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)

*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 2002 and 2003, the immunization rate of children born to white mothers was higher than that of children born to black mothers.

Table 63:

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	5/8 (62.5)	4/5 (80.0)	2/2 (100.0)	4/4 (100.0)
Some high school	37/52 (71.2)	43/49 (87.8)	37/44 (84.1)	21/29 (72.4)
High school graduate	75/108 (69.4)	69/84 (82.1)	44/52 (84.6)	28/33 (84.8)
Some college	43/62 (69.4)	32/41 (78.0)	24/26 (92.3)	15/20 (75.0)
College or more	21/38 (55.2)	24/27 (88.9)	21/23 (91.3)	18/24 (75.0)
Unknown	---	---	---	---
Total	181/268 (67.5)	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	85/102 (83.3)	62/71 (87.3)	53/69 (76.8)
Non-Medicaid	87/104 (83.7)	66/76 (86.8)	33/41 (80.5)
Total	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)

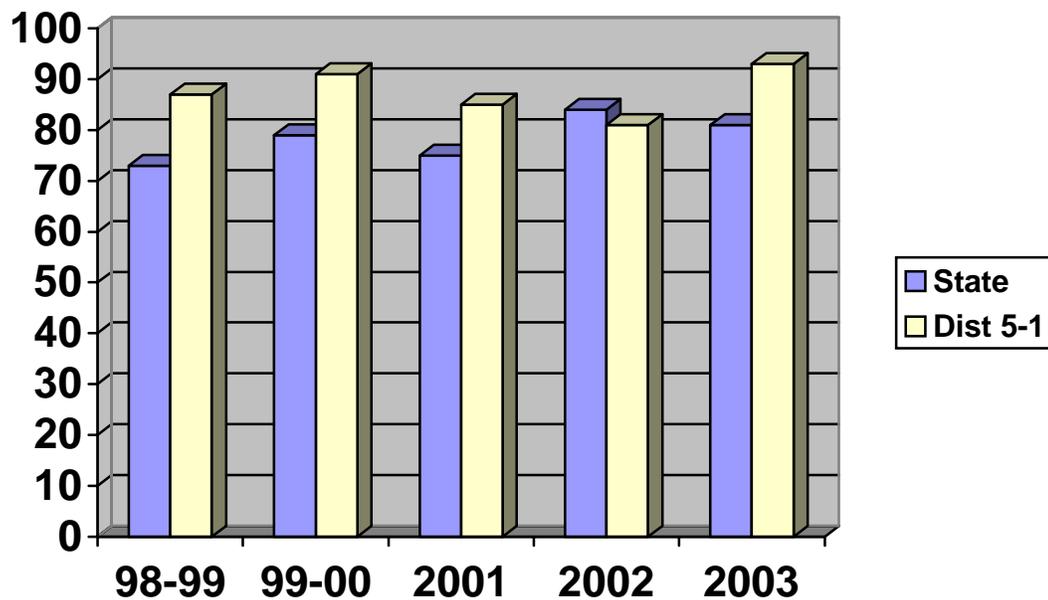
Table 64 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. The immunization rate of children born to non-Medicaid women did not vary significantly from the immunization rate of children born to women using Medicaid.

Individual Health District Report: District 5-1

The eligible sample from this district included 92 children born in January 2001. From the 92 children, 91 records were located (Response Rate=98.9%). Of the 91 located records, there was 1 parental refusal leaving a final sample of 90 records.

- ❖ **The 4:3:1 immunization coverage estimate is 93.3 percent (84/90).** This rate is much higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate 83.3 percent (75/90).** This rate is much higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 65:
District Immunization Rates for
Health District 5-1 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	87.1%	91.3%	86.7%	80.8%	93.3%
3 OPV/IPV	92.9%	93.8%	93.3%	96.2%	97.8%
1 MMR	91.8%	96.3%	91.7%	97.4%	97.8%
3 Hib	94.1%	96.3%	91.7%	97.4%	97.8%
3 HepB	89.4%	96.3%	93.3%	96.2%	96.7%
1 Varicella	21.2%	61.3%	86.7%	84.6%	95.6%

Table 65 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 93.3 to 97.8 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	90	100.0%
DTP2/DTaP2	89	98.9%
DTP3/DTaP3	81	90.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	90	100.0%
OPV/IPV2	89	98.9%
OPV/IPV3	39	43.3%
OPV/IPV4	0	0.0%
MMR1	3	3.3%
MMR2	1	1.1%
HIB1	89	98.9%
HIB2	88	97.8%
HIB3	51	56.7%
HIB4	1	1.1%
HIB5	0	0.0%
HEPB1	89	98.9%
HEPB2	71	78.9%
HEPB3	44	48.9%
HEPB4	0	0.0%
VAR1	2	2.2%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 90

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	39/45 (86.7)	32/36 (88.9)	34/44 (77.3)	56/64 (87.5)
Black	34/39 (87.2)	19/24 (79.2)	29/34 (85.3)	19/25 (76.0)
Other	1/1 (100)	---	---	1/1 (100.0)
Total	74/85 (87.1)	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	2/2 (100.0)	2/2 (100.0)	1/2 (50.0)	---
Some high school	19/22 (86.4)	13/19 (68.4)	23/26 (88.5)	13/16 (81.3)
High school graduate	36/42 (85.7)	19/21 (90.5)	28/36 (77.8)	30/36 (83.3)
Some college	8/9 (88.9)	11/12 (91.7)	3/3 (100.0)	10/12 (83.3)
College or more	9/10 (90.0)	6/6 (100.0)	8/11 (72.7)	23/26 (88.5)
Unknown	---	---	---	---
Total	74/85 (87.1)	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2002 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	29/35 (82.9)	35/43 (81.4)	37/48 (77.1)
Non-Medicaid	22/25 (88.0)	28/35 (80.0)	39/42 (92.9)
Total	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)

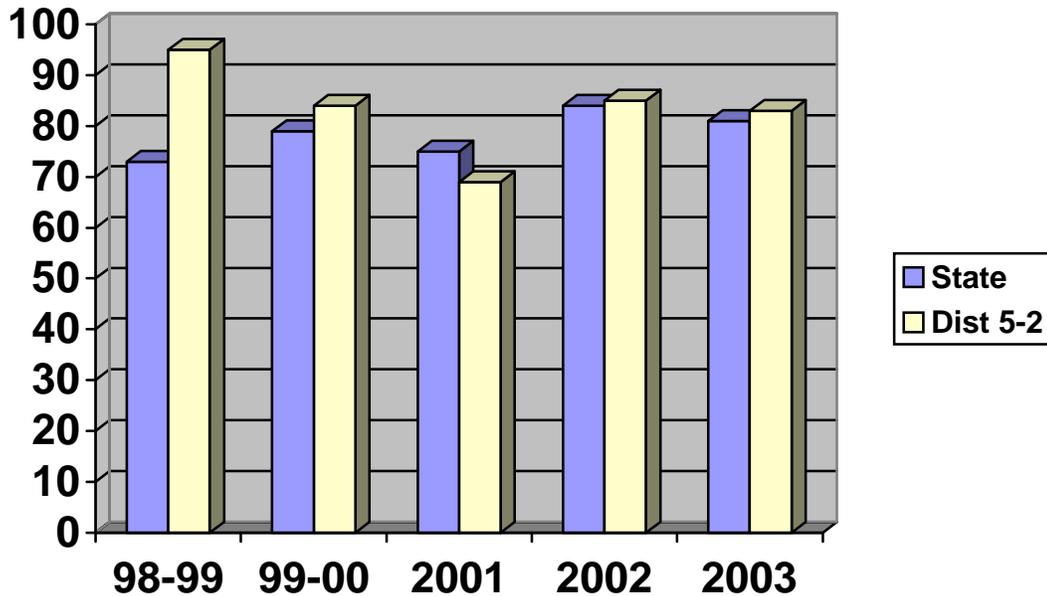
Table 69 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. The immunization rates for District 5-1 vary with maternal Medicaid status.

Individual Health District Report: District 5-2

The eligible sample from this district included 175 children born in January 2001. From the 175 children, 138 records were located (Response Rate=78.9%). Of the 138 located records, there were 12 parental refusals leaving a final sample of 126 records.

- ❖ **The 4:3:1 immunization coverage estimate is 83.3 percent (105/126).**
This rate is higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 74.6 percent (94/126).**
This rate is nearly equal to the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 70:
District Immunization Rates for
Health District 5-2 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	96.5%	83.6%	72.7%	85.5%	84.9%
3 OPV/IPV	98.0%	87.3%	81.8%	94.0%	93.7%
1 MMR	95.7%	90.9%	82.7%	92.3%	96.8%
3 Hib	98.0%	96.4%	84.5%	92.7%	91.3%
3 HepB	97.7%	89.1%	83.6%	93.1%	93.7%
1 Varicella	63.7%	61.8%	80.0%	90.3%	92.9%

Table 70 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 84.9 to 96.8 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	121	96.0%
DTP2/DTaP2	117	92.9%
DTP3/DTaP3	108	85.7%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	121	96.0%
OPV/IPV2	117	92.9%
OPV/IPV3	55	43.7%
OPV/IPV4	0	0.0%
MMR1	6	4.8%
MMR2	0	0.0%
HIB1	121	96.0%
HIB2	117	92.9%
HIB3	41	32.5%
HIB4	1	0.8%
HIB5	0	0.0%
HEPB1	120	95.2%
HEPB2	116	92.1%
HEPB3	72	57.1%
HEPB4	0	0.0%
VAR1	5	4.0%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 126

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	143/151 (94.7)	33/52 (63.5)	109/123 (88.6)	55/68 (80.9)
Black	97/103 (94.2)	43/58 (74.1)	96/120 (80.0)	41/56 (73.2)
Other	2/2 (100.0)	---	4/4 (100.0)	2/2 (100.0)
Unknown	---	----	1/1 (100.0)	---
Total	242/256 (94.5)	76/110 (69.1)	210/248 (84.7)	98/126 (77.8)

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/10 (90.0)	1/4 (25.0)	6/6 (100.0)	---
Some high school	48/51 (94.1)	13/17 (76.5)	45/54 (83.3)	18/23 (78.3)
High school graduate	93/99 (93.9)	41/53 (77.4)	85/104 (81.7)	30/42 (71.4)
Some college	47/50 (94.0)	12/23 (52.2)	44/52 (84.6)	26/33 (78.8)
College or more	45/46 (97.8)	9/13 (69.2)	30/32 (93.8)	24/28 (85.7)
Total	242/256 (94.5)	76/110 (69.1)	210/248 (84.7)	98/126 (77.8)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	44/63 (69.8)	103/131 (78.6)	48/70 (68.6)
Non-Medicaid	32/47 (68.1)	107/117 (91.5)	50/56 (89.3)
Total	76/110 (69.1)	210/248 (84.7)	98/126 (77.8)

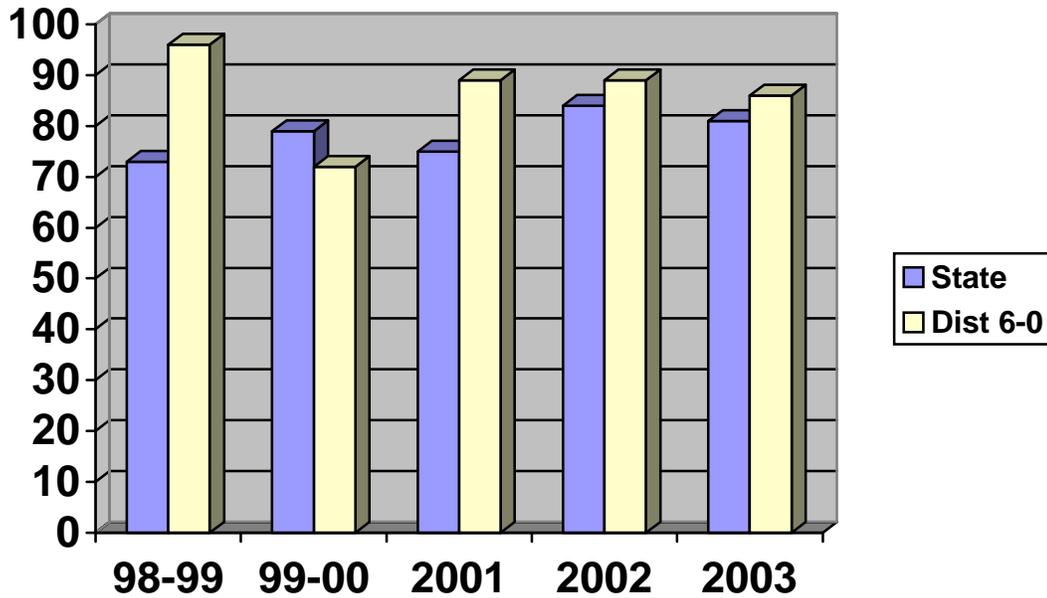
Table 74 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. In the 2002 and 2003 study years, children born to women not using Medicaid had a higher immunization rate than children born to Medicaid women.

Individual Health District Report: District 6-0

The eligible sample from this district included 135 children born in January 2001. From the 135 children, 125 records were located (Response Rate=92.6%). Of the 125 located records, there were 2 parental refusals leaving a final sample of 123 records.

- ❖ **The 4:3:1 immunization coverage estimate is 86.2 percent (106/123).**
This rate is higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 78.9 percent (97/123).**
This rate is higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 75:
District Immunization Rates for
Health District 6-0 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	96.1%	74.5%	89.5%	89.2%	87.8%
3 OPV/IPV	98.3%	85.1%	93.2%	95.1%	91.9%
1 MMR	98.3%	87.2%	95.1%	96.1%	91.9%
3 Hib	98.3%	87.2%	97.5%	97.1%	93.5%
3 HepB	98.9%	85.1%	93.2%	96.1%	95.1%
1 Varicella	75.3%	61.7%	88.3%	97.1%	90.2%

Table 75 reveals the coverage rates of each vaccine series. Coverage rates ranged from 87.8 to 95.1 percent for the 2003 study data.

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:
2003 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 6-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	122	99.2%
DTP2/DTaP2	120	97.6%
DTP3/DTaP3	109	88.6%
DTP4/DTaP4	1	0.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	122	99.2%
OPV/IPV2	119	96.7%
OPV/IPV3	54	43.9%
OPV/IPV4	0	0.0%
MMR1	4	3.3%
MMR2	0	0.0%
HIB1	122	99.2%
HIB2	119	96.7%
HIB3	64	52.0%
HIB4	2	1.6%
HIB5	0	0.0%
HEPB1	122	99.2%
HEPB2	118	95.9%
HEPB3	77	62.6%
HEPB4	0	0.0%
VAR1	4	3.3%
VAR2	0	0.0%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	98/102 (96.0)	57/65 (87.7)	39/42 (92.9)	51/61 (83.6)
Black	71/74 (95.9)	86/96 (89.6)	52/60 (86.7)	48/59 (81.4)
Other	2/2 (100.0)	1/1 (100.0)	---	3/3 (100.0)
Total	171/178 (96.1)	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)

*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 in District 6-0 varied with maternal race.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/4 (100.0)	10/12 (83.3)	3/3 (100.0)	0/1 (0.0)
Some high school	36/37 (97.3)	32/38 (84.2)	18/21 (85.7)	18/21 (81.8)
High school graduate	65/69 (94.2)	47/52 (90.4)	37/42 (88.1)	35/44 (79.5)
Some college	43/44 (97.7)	34/35 (97.1)	18/19 (94.7)	23/26 (88.5)
College or more	23/24 (95.8)	21/25 (84.0)	15/17 (88.2)	26/30 (86.7)
Total	171/178 (96.1)	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)

*Excludes 1999-00 study years.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	83/93 (89.2)	53/61 (86.9)	69/83 (83.1)
Non-Medicaid	61/69 (88.4)	38/41 (92.7)	33/40 (82.5)
Total	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)

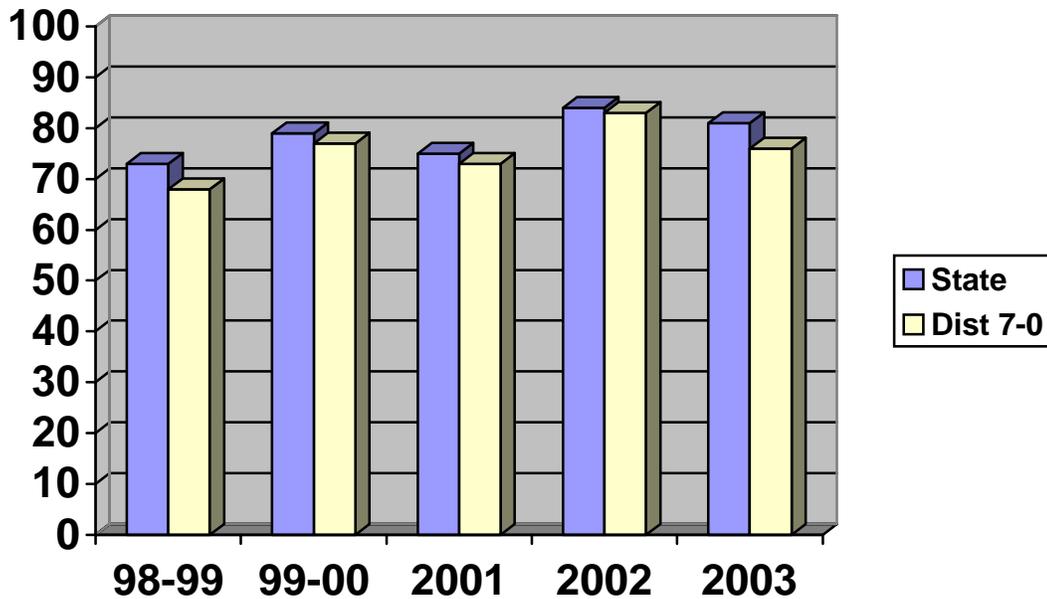
Table 79 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. Table 79 shows that the immunization rates of children in District 6-0 vary with maternal Medicaid status.

Individual Health District Report: District 7-0

The eligible sample from this district included 236 children born in January 2001. From the 236 children, 140 records were located (Response Rate=59.3%). Of the 140 located records, there were no parental refusals leaving a final sample of 140 records.

- ❖ **The 4:3:1 immunization coverage estimate is 76.4 percent (107/140).**
This rate is lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 67.1 percent (94/140).**
This rate is lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 80:
District Immunization Rates for
Health District 7-0 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	69.3%	77.1%	74.3%	83.6%	77.1%
3 OPV/IPV	83.2%	85.9%	78.4%	90.5%	85.0%
1 MMR	83.2%	85.3%	80.2%	92.2%	87.9%
3 Hib	85.4%	85.3%	82.6%	89.7%	85.7%
3 HepB	84.7%	87.6%	85.0%	90.5%	87.9%
1 Varicella	24.1%	53.5%	74.9%	88.8%	85.7%

Table 80 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 77.1 to 87.9 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 7-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	133	95.0%
DTP2/DTaP2	126	90.0%
DTP3/DTaP3	112	80.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	133	95.0%
OPV/IPV2	125	89.3%
OPV/IPV3	45	32.1%
OPV/IPV4	0	0.0%
MMR1	0	0.0%
MMR2	0	0.0%
HIB1	132	94.3%
HIB2	124	88.6%
HIB3	58	41.4%
HIB4	2	1.4%
HIB5	0	0.0%
HEPB1	134	95.7%
HEPB2	126	90.0%
HEPB3	76	54.3%
HEPB4	2	1.4%
VAR1	4	2.9%
VAR2	1	0.7%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	46/61 (75.4)	43/64 (67.2)	36/44 (81.8)	26/38 (68.4)
Black	45/73 (61.6)	78/101 (77.2)	60/72 (83.3)	74/102 (72.5)
Other	2/3 (66.7)	1/2 (50.0)	---	---
Total	93/137 (67.9)	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)

*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, 2002 and 2003 study years.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	8/10 (80.0)	4/6 (66.7)	3/3 (100.0)	1/1 (100.0)
Some high school	14/24 (58.3)	41/53 (77.4)	34/40 (85.0)	23/38 (60.5)
High school graduate	36/58 (62.1)	55/72 (76.4)	35/42 (83.3)	36/51 (70.6)
Some college	21/29 (72.4)	10/13 (76.9)	18/23 (78.3)	21/24 (87.5)
College or more	14/16 (87.5)	12/23 (52.2)	6/7 (85.7)	19/26 (73.1)
Unknown	---	---	0/1 (0.0)	---
Total	93/137 (67.9)	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)

*Excludes 1999-00 study data.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	79/104 (76.0)	70/83 (84.3)	75/101 (74.3)
Non-Medicaid	43/63 (68.3)	26/33 (78.8)	25/39 (64.1)
Total	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)

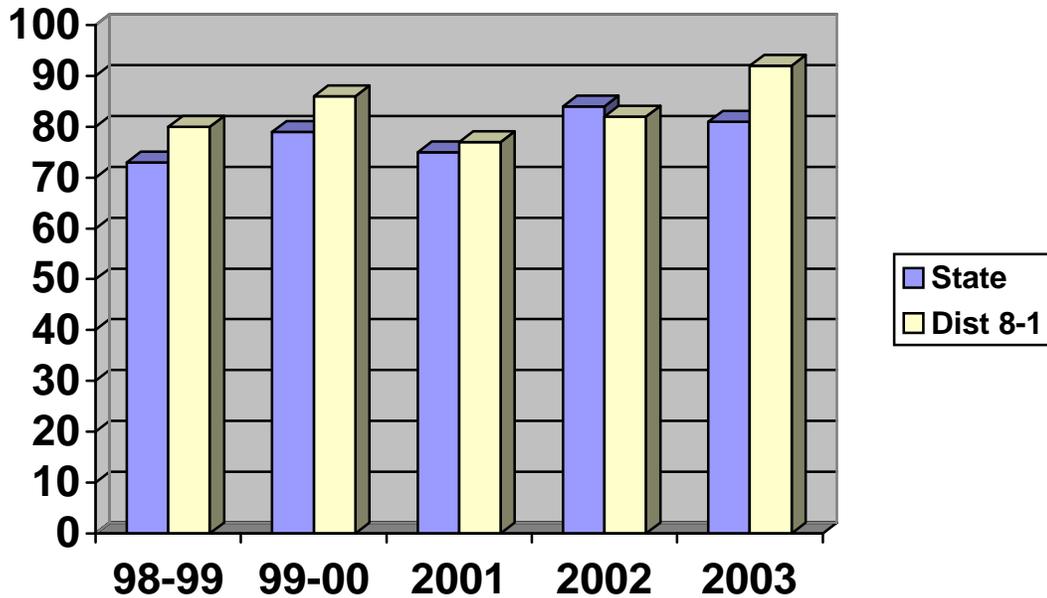
Table 84 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 7-0, children born to Medicaid women had a higher immunization rate than children born to women not using Medicaid for all study years.

Individual Health District Report: District 8-1

The eligible sample from this district included 129 children born in January 2001. From the 129 children, 124 records were located (Response Rate=96.1%). Of the 124 located records, there were no parental refusals leaving a final sample of 124 records.

- ❖ **The 4:3:1 immunization coverage estimate is 91.9 percent (114/124).**
This rate is much higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 87.1 percent (108/124).**
This rate is also much higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 85:
District Immunization Rates for
Health District 8-1 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	81.5%	86.9%	77.7%	82.2%	91.9%
3 OPV/IPV	94.6%	87.9%	84.5%	91.5%	96.0%
1 MMR	89.1%	90.7%	82.5%	93.8%	95.2%
3 Hib	94.6%	92.5%	81.6%	94.6%	95.2%
3 HepB	91.3%	92.5%	84.5%	94.6%	96.0%
1 Varicella	30.4%	61.7%	78.6%	93.0%	94.4%

Table 85 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 91.9 to 96.0 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	123	99.2%
DTP2/DTaP2	119	96.0%
DTP3/DTaP3	112	90.3%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	123	99.2%
OPV/IPV2	119	96.0%
OPV/IPV3	24	19.4%
OPV/IPV4	0	0.0%
MMR1	0	0.0%
MMR2	0	0.0%
HIB1	123	99.2%
HIB2	119	96.0%
HIB3	48	38.7%
HIB4	1	0.8%
HIB5	0	0.0%
HEPB1	124	100.0%
HEPB2	121	97.6%
HEPB3	62	50.0%
HEPB4	1	0.8%
VAR1	8	6.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 124

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	46/56 (82.1)	42/60 (70.0)	67/80 (83.8)	59/69 (85.5)
Black	28/35 (80.0)	36/42 (85.7)	38/48 (79.2)	45/53 (84.9)
Other	0/1 (0.0)	1/1 (100.0)	1/1 (100.0)	2/2 (100.0)
Total	74/92 (80.4)	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)

*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 immunization rate of children varies with maternal race in District 8-1.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/8 (87.5)	9/13 (69.2)	6/9 (66.7)	---
Some high school	21/31 (67.7)	19/26 (73.1)	29/35 (82.9)	19/23 (82.6)
High school graduate	24/27 (88.9)	27/34 (79.4)	34/40 (85.0)	41/47 (87.2)
Some college	12/15 (80.0)	17/22 (77.3)	22/27 (81.5)	17/19 (89.5)
College or more	10/11 (90.9)	7/8 (87.5)	15/18 (83.3)	29/35 (82.9)
Total	74/92 (80.4)	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	50/68 (73.5)	64/74 (86.5)	80/92 (87.0)
Non-Medicaid	29/35 (82.9)	42/55 (76.4)	26/32 (81.3)
Total	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)

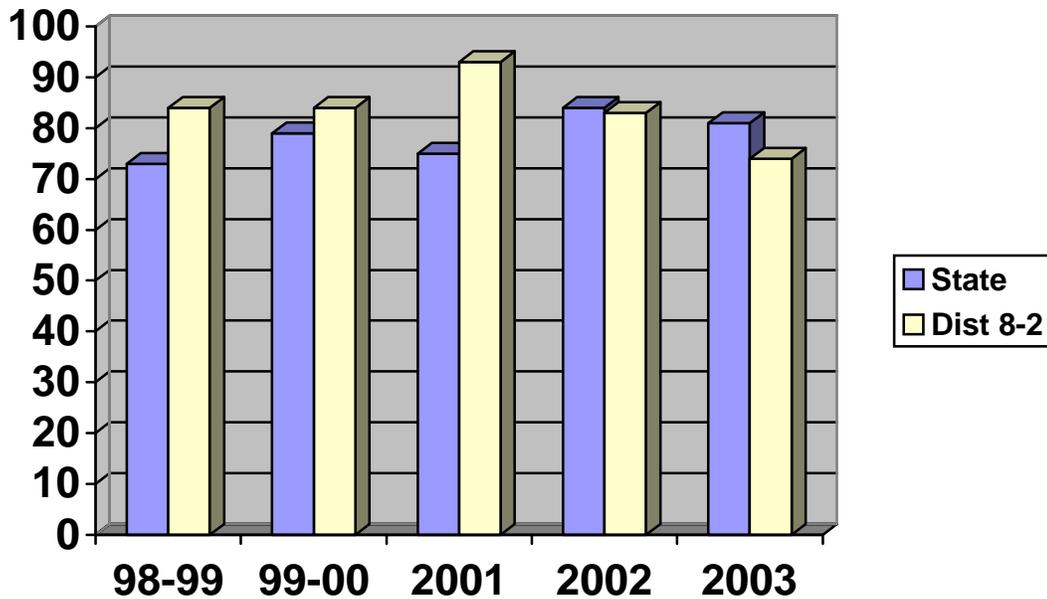
Table 89 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For 2002 and 2003 study years, children born to women using Medicaid had a higher immunization rate than children born to non-Medicaid women.

Individual Health District Report: District 8-2

The eligible sample from this district included 166 children born in January 2001. From the 166 children, 151 records were located (Response Rate=91.0%). Of the 151 located records, there was 1 parental refusal leaving a final sample of 150 records.

- ❖ **The 4:3:1 immunization coverage estimate is 74.0 percent (111/150).**
This rate is lower than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate rate is 68.0 percent (102/150).** This rate is lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

**Table 90:
District Immunization Rates for
Health District 8-2 by Study Year**

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	84.5%	85.6%	94.7%	85.7%	75.3%
3 OPV/IPV	90.1%	90.8%	96.2%	90.9%	80.7%
1 MMR	91.5%	88.9%	97.0%	92.2%	81.3%
3 Hib	90.8%	92.8%	92.5%	92.2%	81.3%
3 HepB	90.8%	90.2%	95.5%	92.2%	82.0%
1 Varicella	71.8%	66.0%	96.2%	90.9%	78.0%

Table 90 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 75.3 to 82.0 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-2**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	132	88.0%
DTP2/DTaP2	128	85.3%
DTP3/DTaP3	116	77.3%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	131	87.3%
OPV/IPV2	128	85.3%
OPV/IPV3	64	42.7%
OPV/IPV4	0	0.0%
MMR1	8	5.3%
MMR2	0	0.0%
HIB1	131	87.3%
HIB2	129	86.0%
HIB3	54	36.0%
HIB4	2	1.3%
HIB5	0	0.0%
HEPB1	131	87.3%
HEPB2	130	86.7%
HEPB3	78	52.0%
HEPB4	1	0.7%
VAR1	6	4.0%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 150

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	56/71 (78.9)	55/58 (94.8)	21/28 (75.0)	47/78 (60.3)
Black	62/70 (88.6)	67/73 (91.8)	40/46 (87.0)	50/71 (70.4)
Other	1/1 (100.0)	2/2 (100.0)	1/1 (100.0)	0/1 (0.0)
Unknown	---	---	2/2 (100.0)	---
Total	119/142 (83.8)	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)

*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 in District 8-2 vary with maternal race.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/11 (81.8)	9/9 (100.0)	7/10 (70.0)	0/2 (0.0)
Some high school	41/48 (85.4)	39/44 (88.6)	21/24 (87.5)	25/37 (67.6)
High school graduate	41/47 (87.2)	44/48 (91.7)	19/25 (76.0)	30/49 (61.2)
Some college	18/23 (78.2)	22/22 (100.0)	11/12 (91.7)	21/29 (72.4)
College or more	10/13 (76.9)	10/10 (100.0)	6/6 (100.0)	21/33 (63.6)
Total	119/142 (83.8)	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	82/90 (91.1)	43/54 (79.6)	60/87 (70.0)
Non-Medicaid	42/43 (97.7)	21/23 (91.3)	37/63 (58.7)
Total	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)

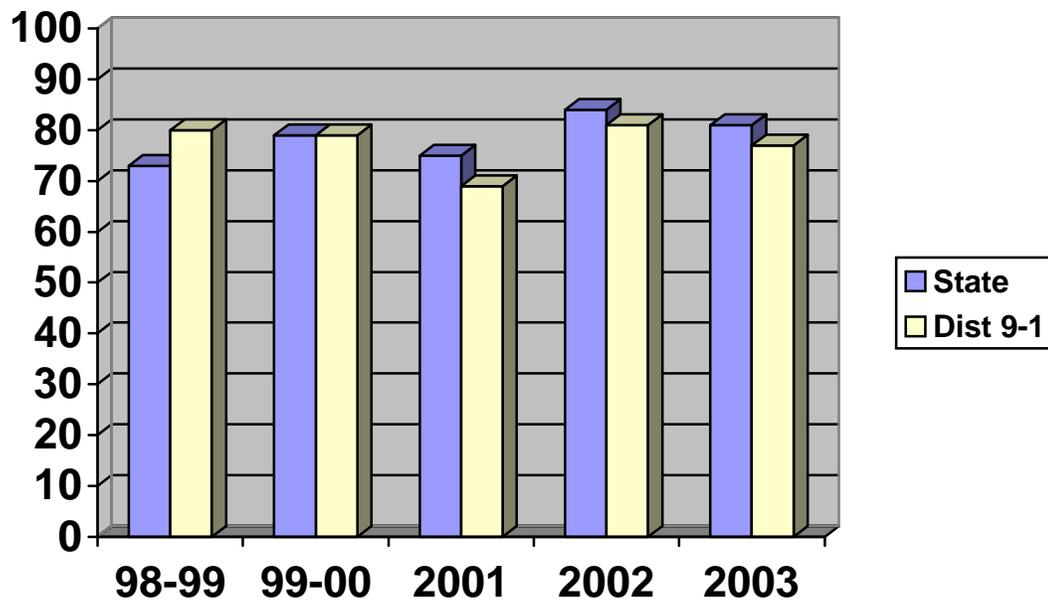
Table 94 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. In the 2003 study year, children born to Medicaid women had a higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 9-1

The eligible sample from this district included 167 children born in January 2001. From the 167 children, 150 records were located (Response Rate=89.8%). Of the 150 located records, there were no parental refusals leaving a final sample of 150 records.

- ❖ **The 4:3:1 immunization coverage estimate is 77.3 percent (116/150).**
This rate is lower to the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 60.7 percent (91/150).**
This rate is also much lower than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 95:
District Immunization Rates for
Health District 9-1 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	80.4%	80.8%	69.9%	81.6%	77.3%
3 OPV/IPV	87.4%	88.5%	79.7%	90.1%	88.7%
1 MMR	86.7%	85.4%	79.7%	89.5%	90.0%
3 Hib	86.0%	91.5%	81.3%	90.8%	87.3%
3 HepB	84.6%	89.2%	76.4%	90.1%	79.3%
1 Varicella	18.8%	51.5%	71.5%	83.6%	83.3%

Table 95 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 77.3 to 90.0 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	150	100.0%
DTP2/DTaP2	141	94.0%
DTP3/DTaP3	127	84.7%
DTP4/DTaP4	2	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	150	100.0%
OPV/IPV2	141	94.0%
OPV/IPV3	83	55.3%
OPV/IPV4	2	1.3%
MMR1	4	2.7%
MMR2	0	0.0%
HIB1	150	100.0%
HIB2	141	94.0%
HIB3	83	55.3%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	147	98.0%
HEPB2	138	92.0%
HEPB3	78	52.0%
HEPB4	4	2.7%
VAR1	5	3.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 150

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	47/66 (71.2)	36/55 (65.5)	51/65 (78.5)	53/74 (71.6)
Black	68/77 (88.3)	47/66 (71.2)	70/83 (84.3)	55/73 (75.3)
Other	---	2/2 (100.0)	0/1 (0.0)	2/3 (66.7)
Unknown	---	---	2/3 (66.7)	---
Total	115/143 (80.4)	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)

*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 rate of children born to white mothers was less than that of black mothers in each of the years of the study.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	8/8 (100.0)	0/2 (0.0)	2/2 (100.0)	---
Some high school	31/37 (83.8)	18/22 (81.8)	21/29 (72.4)	10/15 (66.7)
High school graduate	40/49 (81.6)	38/58 (65.5)	50/60 (83.3)	44/61 (72.1)
Some college	19/26 (73.1)	11/22 (50.0)	19/27 (70.4)	22/30 (73.3)
College or more	17/23 (73.9)	18/19 (94.7)	30/33 (90.9)	34/44 (77.3)
Unknown	---	---	1/1 (100.0)	---
Total	115/143 (80.4)	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	43/64 (67.2)	69/89 (77.5)	60/86 (69.8)
Non-Medicaid	42/59 (71.2)	54/63 (85.7)	50/64 (78.1)
Total	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)

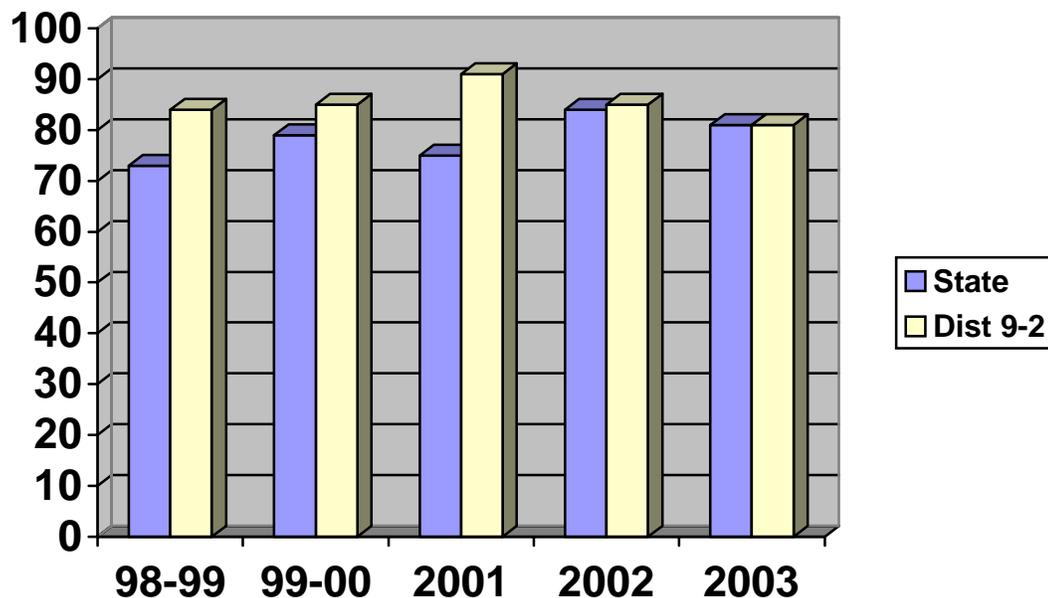
Table 99 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. For Health District 9-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid for all study years.

Individual Health District Report: District 9-2

The eligible sample from this district included 147 children born in January 2001. From the 147 children, 140 records were located (Response Rate=95.2%). Of the 140 located records, there were 2 parental refusals leaving a final sample of 138 records.

- ❖ **The 4:3:1 immunization coverage estimate is 81.2 percent (112/138).**
This rate is essentially the same as the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 73.9 percent (102/138).**
This rate is also essentially the same as the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 100:
District Immunization Rates for
Health District 9-2 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	83.5%	88.0%	92.4%	86.5%	82.6%
3 OPV/IPV	93.4%	90.2%	92.4%	92.1%	88.4%
1 MMR	85.1%	91.0%	93.1%	94.4%	90.6%
3 Hib	93.4%	95.5%	95.4%	93.3%	86.2%
3 HepB	91.7%	91.7%	95.4%	92.1%	87.7%
1 Varicella	27.3%	58.6%	88.5%	87.6%	91.3%

Table 100 reveals the coverage rates of each vaccine series. Coverage rates ranged from 82.6 to 91.3 percent for the 2003 study data.

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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	136	98.6%
DTP2/DTaP2	134	97.1%
DTP3/DTaP3	122	88.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	135	97.8%
OPV/IPV2	131	94.9%
OPV/IPV3	23	16.7%
OPV/IPV4	0	0.0%
MMR1	9	6.5%
MMR2	0	0.0%
HIB1	136	98.6%
HIB2	131	94.9%
HIB3	35	25.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	136	98.6%
HEPB2	132	95.7%
HEPB3	35	25.4%
HEPB4	2	1.4%
VAR1	9	6.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 138

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	81/96 (84.4)	82/92 (89.1)	50/59 (84.7)	76/104 (73.1)
Black	20/25 (80.0)	36/38 (94.7)	24/28 (85.7)	25/32 (78.1)
Other	---	1/1 (100.0)	---	1/2 (50.0)
Unknown	---	---	2/2 (100.0)	---
Total	101/121 (83.5)	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)

*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 rate of children born to white mothers was similar to that of black mothers.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/8 (87.5)	12/12 (100.0)	7/9 (77.8)	1/1 (100.0)
Some high school	18/23 (78.3)	28/33 (84.8)	17/19 (89.5)	10/17 (58.8)
High school graduate	44/51 (86.3)	48/55 (87.3)	33/37 (89.2)	39/59 (66.1)
Some college	15/17 (88.2)	21/21 (100.0)	13/18 (72.2)	26/31 (83.9)
College or more	17/22 (77.3)	10/10 (100.0)	5/5 (100.0)	26/30 (86.7)
Unknown	---	---	1/1 (100.0)	---
Total	101/121 (83.5)	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	68/76 (89.5)	54/62 (87.1)	56/81 (69.1)
Non-Medicaid	51/55 (92.7)	22/27 (81.5)	46/57 (80.7)
Total	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)

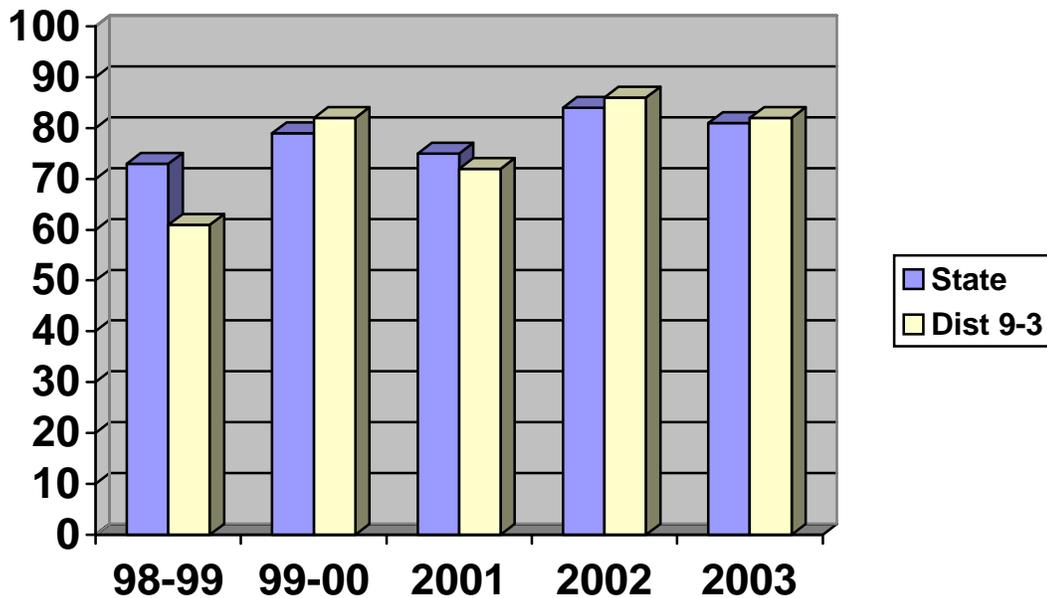
- ❖ Table 104 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. The immunization status of the children in District 9-2 varied with maternal Medicaid status.

Individual Health District Report: District 9-3

The eligible sample from this district included 110 children born in January 2001. From the 110 children, 94 records were located (Response Rate=85.5%). Of the 94 located records, there were no parental refusals leaving a final sample of 94 records.

- ❖ **The 4:3:1 immunization coverage estimate is 81.9 percent (77/94).** This rate is slightly higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 73.4 percent (69/94).** This rate is essentially the same as the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 105:
District Immunization Rates for
Health District 9-3 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	64.2%	82.2%	71.6%	85.6%	83.0%
3 OPV/IPV	77.1%	86.3%	76.8%	89.8%	89.4%
1 MMR	67.9%	87.7%	80.0%	87.3%	89.4%
3 Hib	78.0%	89.0%	81.1%	91.5%	89.4%
3 HepB	81.7%	87.7%	81.1%	89.0%	86.2%
1 Varicella	25.7%	57.5%	69.5%	83.9%	86.2%

Table 105 reveals the coverage rates of each vaccine series. Coverage rates ranged from 83.0 to 89.4 percent for the 2003 study data.

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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-3**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	89	94.7%
DTP2/DTaP2	88	93.6%
DTP3/DTaP3	81	86.2%
DTP4/DTaP4	1	1.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	89	94.7%
OPV/IPV2	87	92.6%
OPV/IPV3	42	44.7%
OPV/IPV4	0	0.0%
MMR1	4	4.3%
MMR2	0	0.0%
HIB1	89	94.7%
HIB2	86	91.5%
HIB3	32	34.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	88	93.6%
HEPB2	85	90.4%
HEPB3	39	41.5%
HEPB4	3	3.2%
VAR1	4	4.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 94

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	38/60 (63.3)	47/67 (70.1)	61/70 (87.1)	51/62 (82.3)
Black	26/46 (56.5)	21/28 (75.0)	39/46 (84.8)	21/29 (72.4)
Other	2/3 (66.7)	---	1/1 (100.0)	3/3 (100.0)
Unknown	---	---	0/1 (0.0)	---
Total	66/109 (60.6)	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)

*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 rate of children born to white mothers was higher than that of black mothers for the 1998-99, 2002 and 2003 study years.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	2/2 (100.0)	7/8 (87.5)	3/3 (100.0)	---
Some high school	17/30 (56.7)	15/23 (65.2)	26/29 (89.7)	15/17 (88.2)
High school graduate	29/47 (61.7)	23/31 (74.2)	38/48 (79.2)	25/35 (71.4)
Some college	12/19 (63.1)	15/21 (71.4)	22/24 (91.7)	15/17 (88.2)
College or more	6/11 (54.5)	8/12 (66.7)	9/11 (81.8)	20/25 (80.0)
Unknown	---	---	3/3 (100.0)	---
Total	66/109 (60.6)	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	38/53 (71.7)	64/73 (87.7)	43/60 (71.7)
Non-Medicaid	30/42 (71.4)	37/45 (82.2)	32/34 (94.1)
Total	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)

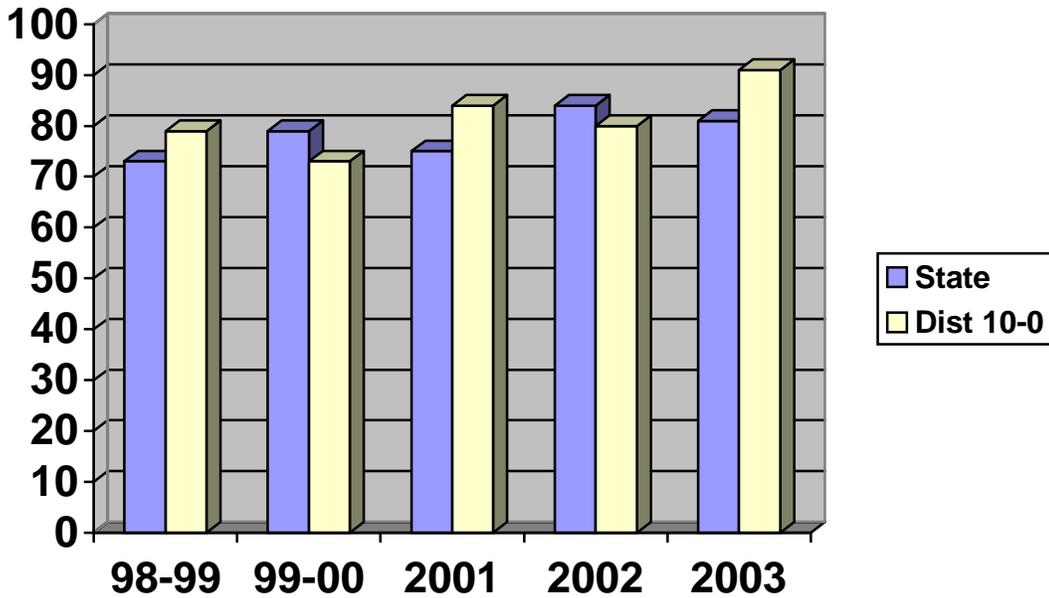
Table 109 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. The immunization status of the children in the sample in District 9-3 varies with maternal Medicaid status.

Individual Health District Report: District 10-0

The eligible sample from this district included 185 children born in January 2001. From the 185 children, 169 records were located (Response Rate=91.4%). Of the 169 located records, there were 7 parental refusals leaving a final sample of 162 records.

- ❖ **The 4:3:1 immunization coverage estimate is 90.7 percent (147/162).**
This rate is much higher than the statewide 4:3:1 immunization rate of 80.8 percent.

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



- ❖ **The 4:3:1+3 immunization coverage estimate is 86.4 percent (140/162).**
This rate is also much higher than the statewide 4:3:1+3 immunization rate of 74.3 percent.

Table 110:
District Immunization Rates for
Health District 10-0 by Study Year

Vaccine	1998-99 Adequate Rates	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates
4 DTP/DTaP	78.9%	74.7%	85.1%	80.2%	93.2%
3 OPV/IPV	86.5%	76.0%	88.3%	86.0%	93.2%
1 MMR	84.8%	77.3%	89.6%	90.1%	93.8%
3 Hib	87.7%	79.9%	94.2%	86.8%	95.7%
3 HepB	87.7%	79.9%	91.6%	88.4%	95.1%
1 Varicella	52.0%	55.8%	87.0%	86.8%	95.7%

Table 110 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 93.2 to 95.7 percent for the 2003 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:
2003 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 10-0**

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	159	98.1%
DTP2/DTaP2	157	96.9%
DTP3/DTaP3	148	91.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	159	98.1%
OPV/IPV2	157	96.9%
OPV/IPV3	50	30.9%
OPV/IPV4	0	0.0%
MMR1	2	1.2%
MMR2	0	0.0%
HIB1	158	97.5%
HIB2	155	95.7%
HIB3	47	29.0%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	157	96.9
HEPB2	154	95.1%
HEPB3	49	30.2%
HEPB4	0	0.0%
VAR1	2	1.2%
VAR2	0	0.0%

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

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	109/141 (77.3)	98/118 (83.1)	69/88 (78.4)	111/127 (87.4)
Black	25/28 (89.2)	32/35 (91.4)	26/31 (83.9)	23/30 (76.7)
Other	1 /2 (50.0)	0/1 (0.0)	1/1 (100.0)	4/5 (80.0)
Unknown	---	---	1/1 (100.0)	---
Total	135/171 (78.9)	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)

*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 vary with maternal race.

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

	1998-99 4:3:1 Adequate	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	2/3 (66.7)	14/18 (77.8)	5/7 (71.4)	---
Some high school	25/33 (75.8)	28/32 (87.5)	25/29 (86.2)	26/32 (81.3)
High school graduate	50/66 (75.8)	48/59 (81.4)	35/47 (74.5)	45/59 (76.3)
Some college	33/39 (84.6)	23/26 (88.5)	12/14 (85.7)	28/31 (90.3)
College or more	25/30 (83.3)	17/19 (89.5)	20/23 (87.0)	39/40 (97.5)
Unknown	---	---	0/1 (0.0)	---
Total	135/171 (78.9)	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)

*Excludes 1999-00 study year.

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

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

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

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	57/69 (82.6)	47/59 (79.7)	71/86 (82.6)
Non-Medicaid	73/85 (85.9)	50/62 (80.6)	67/76 (88.2)
Total	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)

Table 114 shows immunization status of children born to women stratified by Medicaid status for the 2001, 2002 and 2003 study years. 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 seventh 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 2002-03. To assess these rates, the study drew an original sample of 3,813 children born in January 2001. The final sample of returned immunization records totaled 3,813. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 3,613. Of these, 2,567 were located and make up the final sample.

The seventh year of the GIS, 2003, measured immunization coverage for children born in 2001 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 1998-99, 1999-00, 2001, 2002 and 2003. The newer 4:3:1+3 measure of

*It must be remembered that the 2003 study is estimating 2001 rates. The 2002 study is estimating 2000 rates, 2001 study estimated 1999 rates, 1999-00 study estimated 1997 rates, and the 1998-99 study estimated rates for 1996.

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, 2001 and 2002.

The 2003 results reflect immunization rates for children born in 2001. The results of the study indicate that, of the 2,567 children whose immunization records were located during 2003 data collection:

- 74.3 percent of children born in January of 2001 in Georgia were adequately immunized with the 4:3:1+3 vaccine series.
- 80.8 percent of children born in January of 2001 in Georgia were adequately immunized with the 4:3:1 vaccine series, compared to 83.9 percent of children born in January of 2000, 75.1 percent of children born in January of 1999, 78.8 percent of children born in November of 1997, and 73.3 percent of children born in April of 1996

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

- 66.0 percent to 94.7 percent in the 2003 study
- 73.9 percent to 94.3 percent in the 2002 study
- 42.4 percent to 94.8 percent in the 2001 study
- 60.7 percent to 94.5 percent in the 1999-00 study
- 53.8 percent to 96.1 percent in the 1998-99 study

The study investigated where the immunizations are being administered in Georgia (See Appendix E). In the seventh study year, 74.8 percent of the shots found were given by private providers.

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

Conclusions

Immunization rates for the 4:3:1+3 vaccine series decreased slightly from the 2002 study (78.9 to 74.3). The 2003 Georgia Immunization Study (GIS) measured Varicella rates for the sixth 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 decreased slightly statewide from the 2002 study (83.9 percent) to 80.8 percent in 2003.

The results of the previous four years of the GIS study (1998-99, 1999-00, 2001 and 2002) 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.

Strengths

1. This study represents Georgia's seventh 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 1996, 1997, 1999, 2000 and 2001 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 1 percent for the 2003 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 2001 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 2001, it could not account for variations that may routinely occur in other months of the year. Second, limiting the sample to children born in one month does not form the basis of a surveillance system capable of detecting changes in the health care system. Third, there may be children in the eligible sample who were erroneously included in the eligible sample and listed as not located. Examples of this type of error would be cases where a child died, was adopted, or was part of a military family, but the child's ineligibility related to these circumstances never became known to the study participants because the child could not be found. Although public health representatives were trained to follow the same protocol, each worked independently with limited supervision and may have deviated from the stated protocol in order to obtain all of the information.
2. Each year of the study fewer records were found in the public health system and consequently more parents had to be located. Parents in the Metro Atlanta area more often refused to participate (District 3-2). Response rates tended to be lower in the Metro area (District 3-1, 3-2 and 3-5).

APPENDIX A:

DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

APPENDIX A: DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

The target population for this study was children born in the state of Georgia in 2001 who were residing in the state in 2003. 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 2001 in the state of Georgia who were born to Georgia residents, not in military hospitals, and who survived until their first birthday. This choice of sampling frame assumes no seasonality in birth coverage or exposure to immunizations in the state in 2001. 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 2003. 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 2003 Study. Response rates and immunization coverage levels from the 2002 study were used in the sample size calculation for the 2003 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 2002 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 36.1 percent to a high of 98.9 percent, with the average response rate for the state at 74.2 percent. The state level data are based on a sample stratified by health district, with differing probabilities of selection. Therefore, the district data were weighted in order to provide more accurate, weighted estimates for the state level coverage rates.

**Table 115:
Data Used for Sample Size Estimates
for the 2003 Study**

A	B	C	D	E	F	G	H
Health District	Jan 2001 Total Births	Jan 2001 Eligible Births	2002 4:3:1 Immunization Rates	2003 First Sample Estimate	2003 Second Sample Estimate	Return Rate based on 2002 Eligible Sample	2003 Adjusted Sample Size
1-1	694	670	0.806	240.275	176.852	0.882	201
1-2	500	490	0.791	254.036	167.300	0.893	187
2-0	628	610	0.934	94.725	81.9923	0.724	113
3-1	1,016	980	0.845	201.261	166.971	0.675	247
3-2	1,109	1,063	0.826	220.852	182.860	0.367	498
3-3	391	374	0.739	296.386	165.350	0.307	374
3-4	1,104	1,078	0.943	82.596	76.7178	0.848	90
3-5	908	868	0.846	200.200	162.679	0.579	281
4-0	784	749	0.871	172.655	140.312	0.796	176
5-1	163	155	0.808	238.388	93.928	0.988	95
5-2	576	549	0.847	199.135	146.130	0.790	185
6-0	546	526	0.892	148.033	115.522	0.843	137
7-0	447	430	0.828	218.842	145.031	0.571	254
8-1	305	298	0.822	224.835	128.149	0.942	136
8-2	482	469	0.831	215.804	147.797	0.875	169
9-1	383	375	0.809	237.440	145.386	0.817	178
9-2	408	394	0.854	191.594	128.909	0.891	145
9-3	314	296	0.856	189.412	115.502	0.758	152
10-0	430	416	0.802	244.012	153.799	0.790	195
State	11,188	10,790	0.839			0.686	3,813

Figure 23:
Explanations of Table 115
Data Used for Sample Size Estimates
For the 2003 Study

<u>Column A:</u>	Health District	District number.
<u>Column B:</u>	January 2001 Total Births	Given. Source: DHR Vital Statistics Office.
<u>Column C:</u>	January 2001 Eligible Births	
<u>Column D:</u>	2002 4:3:1 Immunization Rates	Given. Source: Georgia Birth Cohort Follow-up Study (2001).
<u>Column E:</u>	First Sample Estimate - 2003 Study	Formula Used: $3.8416 \times (D) (1 - D) / .0025$
<u>Column F:</u>	Second Sample Estimate - 2003 Study	Adjustment for small size district populations. Formula Used: $E / (1 + E/C)$.
<u>Column G:</u>	Estimated Return Rate (Based on 2002 Study)	Given. Source: Georgia Birth Cohort Follow-up Study (2001).
<u>Column H:</u>	Adjusted Sample Size - 2003 Study	Formula Used: $(\text{Column F}) / (\text{Column G})$

APPENDIX B:

**LIST OF 2003 PUBLIC HEALTH REPRESENTATIVES
FOR THE
GEORGIA IMMUNIZATION STUDY**

APPENDIX B: LIST OF 2003 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	Sandy Moore, LPN
3-1	Joy Stymest
3-2	Georgia Goseer, R.N. Likesar McCray
3-3	Lisa Germany Freda Sheppard
3-4	Kathy Heidish, R.N. Gloria Melvin Eunice Rose
3-5	Joyce Hess, R.N.
4-0	Tina Dempsey, L.P.N. Deborah Cox, L.P.N. Amy Fenn, RN
5-1	Donna Forth, R.N.
5-2	Debbie Liby, R.N. German Gonzales, MD
6-0	Melba McNorril, R.N. Clois Witt, R.N., B.S.N.
7-0	Beverly Roberson, R.N., B.S.N.
8-1	Simple Singh, M.D, M.P.H Yugonda Thomas Dorene Wilson
8-2	Edward W. Sullivan
9-1	Susan Malone, R.N.
9-2	Lisa Boyett Hollard Phillips, M.S. Doris Wilbon, B.S. Stacy Giles, R.N. JoAnn Deas, R.N. Pat Thomas, R.N. Linda Sornson, R.N.
9-3	Jennifer Foster, M.S.
10-0	Dionne Hansey Barbie Bushey, R.N., C.P.N., M.P.H.

APPENDIX C:
DATA COLLECTION FORM

APPENDIX D:
VARICELLA VACCINE AND
CHICKEN POX DATA

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 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.

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:
2003 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	116	76.8	131	86.8	0	0.0
1-2	132	86.3	138	90.2	1	0.7
2-0	89	94.7	91	96.8	0	0.0
3-1	112	77.2	117	80.7	0	0.0
3-2	96	69.6	99	71.7	0	0.0
3-3	221	82.5	227	84.7	0	0.0
3-4	50	83.3	54	90.0	0	0.0
3-5	104	69.3	111	74.0	1	0.7
4-0	99	90.0	102	92.7	0	0.0
5-1	78	86.7	86	95.6	1	1.1
5-2	104	82.5	117	92.9	0	0.0
6-0	104	84.6	111	90.2	1	0.8
7-0	112	80.0	120	85.7	0	0.0
8-1	111	89.5	117	94.4	0	0.0
8-2	112	74.7	117	78.0	0	0.0
9-1	115	76.7	125	83.3	2	1.3
9-2	121	87.7	126	91.3	0	0.0
9-3	75	79.8	81	86.2	1	1.1
10-0	149	92.0	155	95.7	0	0.0
Statewide	2,101	81.8	2,226	86.7	7	0.3

Figure 24: 2003 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

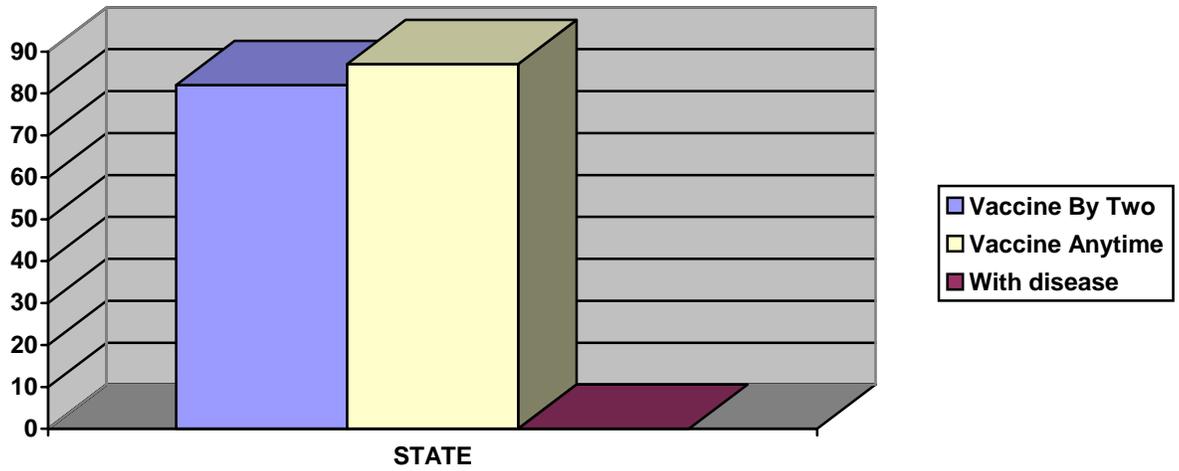


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

Appendix E:
Provider of Immunizations

Appendix E: Provider of Immunizations

Information about the provider of the immunizations was collected by noting where the shots were given (Public Health, Private Health, or Both) and who provided the information (Health Department, Private Provider, or Parent). If there was no indication of who gave the individual shot, the location for that shot was classified as unknown. The total number and percentage of shots given at each of the provider categories is shown in Table 117.

Table 117:
Statewide Percentage of Shots by Provider: 1998-99, 1999-00, 2001, 2002 and 2003

Provider	1998-99		1999-00		2001		2002		2003	
	Total #	%								
Public Health Dept	20,222	45.1	11,248	29.1	9,472	25.5	8,085	20.3	5,873	16.3
Private Physician	22,686	50.6	23,984	61.9	25,797	69.5	28,667	71.9	26,956	74.8
Unknown	1,934	4.3	3,503	9.0	1,866	5.0	3,112	7.8	3,205	8.9
Total	44,842	100.0	38,735	100.0	37,135	100.0	39,864	100.0	36,034	100.0

As shown in Table 117, in 2003, over 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 2003

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	Percent	# Shots Given	Percent	# Shots Given	Percent	
1-1	347	16.4	1,410	66.9	351	16.7	2,108
1-2	358	16.2	1,788	81.0	61	2.8	2,207
2-0	344	25.2	999	73.0	25	1.8	1,368
3-1	358	18.4	822	42.2	768	39.4	1,948
3-2	532	32.1	798	48.2	325	19.7	1,655
3-3	206	5.4	3,486	90.7	150	3.9	3,842
3-4	18	2.1	821	97.9	0	0.0	839
3-5	225	11.6	1,421	73.5	288	14.9	1,934
4-0	319	19.7	1,033	64.0	264	16.3	1,616
5-1	318	23.1	1,021	74.1	38	2.8	1,377
5-2	411	22.2	1,365	73.9	72	3.9	1,848
6-0	117	6.4	1,643	89.7	71	3.9	1,831
7-0	422	21.7	1,495	76.8	30	1.5	1,947
8-1	416	22.4	1,446	77.6	0	0.0	1,862
8-2	229	11.7	1,214	62.2	510	26.1	1,953
9-1	200	9.2	1,866	86.0	104	4.8	2,170
9-2	644	32.6	1,311	66.4	21	1.0	1,976
9-3	83	6.2	1,245	93.8	0	0.0	1,328
10-0	326	14.7	1,772	79.6	127	5.7	2,225
State	5,873	16.3	26,956	74.8	3,205	8.9	36,034

In Year Seven:

- ❖ Seventeen health districts gave more than 50% of the shots in the **Private sector**.

Results by region:

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

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

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

In the metro-Atlanta area more of the immunizations were administered in the private sector than in the public sector. District 3-1, Cobb County had the highest number of unknown shot locations (39.4 percent).

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

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

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

Private providers provided the majority of vaccinations in all health districts.

Four Year Comparison of Provider Information

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

Table 119:
Location of Immunizations by District
Four Year Comparison
1999-00, 2001, 2002, 2003

District	Public Health Department				Private Physician			
	99-00	2001	2002	2003	99-00	2001	2002	2003
1-1	51.7	26.5	20.3	16.4	44.2	65.7	73.2	66.9
1-2	24.9	16.0	13.7	16.2	72.6	81.3	66.9	81.0
2-0	35.5	20.3	24.3	25.2	48.3	75.9	75.0	73.0
3-1	18.8	18.9	19.1	18.4	57.5	55.3	54.4	42.2
3-2	30.6	28.7	24.0	32.1	60.2	48.9	56.5	48.2
3-3	19.1	20.2	26.6	5.4	53.4	66.2	59.1	90.7
3-4	8.9	3.1	7.4	2.1	77.1	96.9	87.9	97.9
3-5	25.9	22.0	11.7	11.6	65.9	75.7	86.4	73.5
4-0	35.8	25.4	19.9	19.7	61.0	74.2	76.5	64.0
5-1	51.8	43.7	29.9	23.1	43.2	52.5	69.0	74.1
5-2	46.3	44.9	26.7	22.2	53.6	51.4	66.2	73.9
6-0	34.9	14.5	24.1	6.4	59.8	84.9	74.6	89.7
7-0	36.1	36.1	22.8	21.7	55.6	63.8	77.1	76.8
8-1	23.1	30.6	20.5	22.4	76.3	69.3	78.7	77.6
8-2	26.5	29.6	22.8	11.7	59.8	70.4	73.9	62.2
9-1	14.4	16.7	17.5	9.2	81.7	81.1	78.2	86.0
9-2	57.9	53.9	36.4	32.6	39.7	45.5	59.7	66.4
9-3	31.0	23.6	16.9	6.2	61.2	75.7	82.2	93.8
10-0	34.1	19.7	19.9	14.7	65.8	80.1	80.1	79.6
State Totals	29.0	25.5	20.3	16.3	61.9	69.5	71.9	74.8

Four-Year Comparison: Summary of Table 119

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 public 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 public health department 69.5% of the shots were given in the private sector 5.0% of the shot locations were unknown
In 2002	20.3% of the shots were received at the public health department 71.9% of the shots were given in the private sector 7.8% of the shot locations were unknown
In 2003	16.3% of the shots were received at the public health department 74.8% of the shots were given in the private sector 8.9% of the shot locations were unknown

APPENDIX F:

**MARGINS OF ERROR FOR
IMMUNIZATION COVERAGE RATES**

APPENDIX F: MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

Margins of error were calculated for all statewide and district immunization coverage rates, including 4:3:1+3 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 2001 is between 79.2 and 82.4 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 2003
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	151	66.9	+/- 7.5	59.4 – 74.4
1-2	153	81.7	+/- 6.1	75.6 – 87.8
2-0	94	91.5	+/- 5.6	85.9 – 97.1
3-1	145	72.4	+/- 7.3	65.1 – 79.7
3-2	138	65.9	+/- 7.9	58.0 – 73.8
3-3	269	74.6	+/- 5.2	69.4 – 79.8
3-4	60	83.3	+/- 9.4	73.9 – 92.7
3-5	150	58.7	+/- 7.9	50.8 – 66.6
4-0	110	79.1	+/- 7.6	71.5 – 86.7
5-1	90	83.3	+/- 7.7	75.6 – 91.0
5-2	126	74.6	+/- 7.6	67.0 – 82.2
6-0	123	78.9	+/- 7.2	71.7 – 86.1
7-0	140	67.1	+/- 7.8	59.3 – 74.9
8-1	124	87.1	+/- 5.9	81.2 – 93.0
8-2	150	68.0	+/- 7.5	60.5 – 75.5
9-1	150	60.7	+/- 7.8	52.9 – 68.5
9-2	138	73.9	+/- 7.3	66.6 – 81.2
9-3	94	73.4	+/- 8.9	64.5 – 82.3
10-0	162	86.4	+/- 5.3	81.1 – 91.7
Statewide Rate (weighted)	2,567	74.3	+/- 1.7	72.6 – 76.0

Table 121:
Margins of Error for 2003
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	151	77.5	+/- 6.7	70.8 – 84.2
1-2	153	85.6	+/- 5.6	80.0 – 91.2
2-0	94	94.7	+/- 4.5	90.2 – 99.2
3-1	145	75.2	+/- 7.0	68.2 – 82.2
3-2	138	68.1	+/- 7.8	60.3 – 75.9
3-3	269	78.4	+/- 4.9	73.5 – 83.3
3-4	60	90.0	+/- 7.6	82.4 – 97.6
3-5	150	66.0	+/- 7.6	58.4 – 73.6
4-0	110	83.6	+/- 6.9	76.7 – 90.5
5-1	90	93.3	+/- 5.2	88.1 – 98.5
5-2	126	83.3	+/- 6.5	76.8 – 89.8
6-0	123	86.2	+/- 6.1	80.1 – 92.3
7-0	140	76.4	+/- 7.0	69.4 – 83.4
8-1	124	91.9	+/- 4.8	87.1 – 96.7
8-2	150	74.0	+/- 7.0	67.0 – 81.0
9-1	150	77.3	+/- 6.7	70.6 – 84.0
9-2	138	81.2	+/- 6.5	74.7 – 87.7
9-3	94	81.9	+/- 7.8	74.1 – 89.7
10-0	162	90.7	+/- 4.5	86.2 – 95.2
Statewide Rate (weighted)	2,567	80.8	+/- 1.6	79.2 – 82.4

**Table 122:
Margins of Error for 2003
Statewide and District 3:3:1 Rates**

Health District	Sizes of Final Sample (Records Located)	3:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	151	82.1	+/- 6.1	76.0 – 88.2
1-2	153	88.9	+/- 5.0	83.9 – 93.9
2-0	94	94.7	+/- 4.5	90.2 – 99.2
3-1	145	80.0	+/- 6.5	73.5 – 86.5
3-2	138	69.6	+/- 7.7	61.9 – 77.3
3-3	269	83.6	+/- 4.4	79.2 – 88.0
3-4	60	90.0	+/- 7.6	82.4 – 97.6
3-5	150	78.7	+/- 6.6	72.1 – 85.3
4-0	110	90.0	+/- 5.6	84.4 – 95.6
5-1	90	96.7	+/- 3.7	93.0 – 100.4
5-2	126	92.9	+/- 4.5	88.4 – 97.4
6-0	123	90.2	+/- 5.3	84.9 – 95.5
7-0	140	84.3	+/- 6.0	78.3 – 90.3
8-1	124	95.2	+/- 3.8	91.4 – 99.0
8-2	150	79.3	+/- 6.5	72.8 – 85.8
9-1	150	86.0	+/- 5.6	80.4 – 91.6
9-2	138	86.2	+/- 5.8	80.4 – 92.0
9-3	94	87.2	+/- 6.8	80.4 – 94.0
10-0	162	91.4	+/- 4.3	87.1 – 95.7
Statewide Rate (weighted)	2,567	85.9	+/- 1.3	84.6 – 87.2