

# Georgia Immunization Study

— 2016 —

GEORGIA DEPARTMENT of PUBLIC HEALTH

**Immunization Program** | Acute Disease | Epidemiology Section



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# Executive Summary

The 2016 Georgia Immunization Study (GIS) was conducted by the Georgia Department of Public Health Epidemiology Program, Georgia Immunization Program, and Public Health Districts. The study employed a retrospective cohort research design to determine the up-to-date (UTD) immunization rate for 2-year-old children born in the State of Georgia. Immunization history data for 18 Health District cohorts of children who turned two in January 2016 were analyzed to calculate these rates. Identifying information was obtained from electronic birth records, and immunization history data were collected primarily via the Georgia Registry of Immunization Transactions and Services (GRITS). Immunization rates for the 4:3:1:3:3:1:4 series (4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 Hepatitis B, 1 Varicella, and 4 PCV) were based on the childhood immunization and catch-up schedules recommended by the Advisory Committee on Immunization Practices (ACIP) in 2014<sup>1</sup>.

Each child's immunization record was reviewed to determine if it was up-to-date (UTD). If the child's record was not UTD, an effort was made by local public health staff to contact parents, guardians and providers to obtain any missing immunization history data. If further follow-up revealed that the child was truly not up-to-date, the data collection process served as a reminder-recall system for parents and providers.

If all of the 4:3:1:3:3:1:4 series dates occurred before the child reached 24 months of age or if the series was completed according to the ACIP catch-up schedule guidance, the child was classified as *up-to-date by 24 months*. Children were excluded from the *up-to-date by 24 months* classification if at least one of the 4:3:1:3:3:1:4 dates occurred after the child reached 24 months of age and did not meet the catch-up schedule recommendations. **In 2016, the Georgia statewide up-to-date immunization rate by 24 months was 82.1 percent, down from 82.7 percent in 2015 ( Table 1, pg. 12).**

There was considerable variation by District in the percent of children found to be UTD by 24 months, ranging from 73.5 percent in District 9-1 to 91.4 percent in District 9-2. The greatest UTD by 24 months improvement was observed in District 2-0, which had a 6.9 percentage point increase from 2015 to 2016 (Appendix Table C, pg. iv).

The vaccine completion rate at the end of the study period was calculated as *up-to-date by end of data collection*. This rate ranged from 81.9 percent in District 9-1 to 96.8 percent in District 8-1. Efforts to bring children up-to-date resulted in an overall 8.9 percentage point increase in the

immunization rates between 24 months of age and the end of the data collection period statewide (Table 1, pg 12). This increase provides evidence that many of the children who are not up-to-date by 24 months can be brought up-to-date within six months if parent outreach and educational measures are taken. The greatest impact was observed in District 9-2, where up-to-date immunization rates increased by 16.9 percentage points by the end of the data collection period (Appendix Table C, pg. iv). Although the majority of immunizations in our sample were administered in the private sector, the increase in up-to-date immunization rates by the end of the data collection period is a testament to how instrumental District- and County-level public health staff can be in raising childhood immunization rates for a selected group of children. In addition, this increase shows that parents want their children to stay current on their vaccinations, but may benefit from reminders and follow-up from their providers.

An additional immunization rate was calculated: *up-to-date by 24 months based on GRITS alone*. This rate represents the percentage of study participants whose vaccines were UTD by 24 months based only on the information found in GRITS, i.e. no follow up with parents or providers. The UTD immunization rate based on GRITS data alone for the state was 76.5 percent- 3.2 percentage points lower than 2015 and 5.6 percentage points below the UTD by 24 months rate for 2016- indicating that GRITS is well utilized among GA practitioners and serves as an excellent source of vaccination information for young children.

Although acute infection with Hepatitis B causes severe disease in only a small proportion of those infected, the greater burden of disease lies in those cases progressing to chronic infection, cirrhosis and liver cancer later in life. Therefore, timely immunization practices with hepatitis B vaccine are a high priority for the Georgia Immunization Program, as well as for providers and hospitals throughout the state. Among the 2016 study sample, 83.6 percent received their first dose of hepatitis B vaccine at birth, an increase from 81.8 percent in 2015. In addition, the percentage of children who received the entire 3-dose hepatitis B series by 24 months of age decreased from 95.9 percent in 2015 to 95.0 percent in 2016 (Table 1, pg. 12).

The percentage of Georgia children who received the fourth dose of DTaP by 24 months of age decreased by 0.4 percentage points from 2015 to 2016. This rate continues to significantly lag behind the percentage of children who received the third dose by 24 months of age. In fact, 95.4 percent of children received three doses of DTaP by 24

<sup>1</sup> Department of Health and Human Services - Centers for Disease Control and Prevention. (February 1, 2014). MMWR weekly; Recommended Immunization Schedule for Persons Aged 0 Through 18 Years --- United States, 2014. MMWR 2014; 63(01). Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/su6201a2.htm>

months of age while only 84.3 percent received their fourth dose in 2016 (Table 1, pg. 12). The third dose of DTaP can be given as early as 6 months of age; however, the fourth dose must be delayed until at least 12 months of age and 6 months after the third dose. These results suggest that patient outreach efforts specific to the fourth dose of DTaP may be helpful for parents after their child's one year check-up.

Medicaid eligibility, entered into GRITS by providers at time of vaccination, was analyzed to determine Medicaid status at time of vaccine administration. Participants were assigned into categories based on their Medicaid coverage (Medicaid both years, first year only, second year only and never covered by Medicaid). The UTD rate by 24 months (57.3%) for children who were covered by Medicaid the first year, but not the second year, was much lower than in any of the other categories, including

those not covered by Medicaid either year (Table 4, pg. 14). Further analysis revealed that vaccines that are typically administered after 12 months (MMR, Varicella and 4th DTaP) were less likely among those whose Medicaid coverage only lasted the first year of life (Table 5, pg. 14).

The 2016 GIS report offers the people of Georgia and its Health Districts a chance to study demographic and immunization history data simultaneously, so that evidence-based programs can be created to raise immunization rates across the State of Georgia. The 2016 data show that although the vast majority of immunizations are administered outside of public health clinics, public health staff can effectively collaborate with parents and private sector providers and have an impact on improving immunization coverage rates.

# Abbreviations and Vaccine Names

<b>Abbreviation</b>	<b>Definition</b>
2YO	Two-year-old
ACIP	Advisory Committee on Immunization Practices
CDC	Centers for Disease Control and Prevention
GIS	Georgia Immunization Study
GRITS	Georgia Registry of Immunization Transactions and Services
NIS	National Immunization Survey (CDC)
UTD	Up-to-date [immunization history]
WIC	Women, Infants, and Children Program
DTaP	Diphtheria, Tetanus, and acellular Pertussis [vaccine]
IPV	Inactivated Polio Virus [vaccine]
MMR	Measles, Mumps, Rubella [vaccine]
HepB	Hepatitis B [vaccine]
Hib	Haemophilus influenza type b [vaccine]
Varicella	Varicella (chicken pox) [vaccine]
PCV	Pneumococcal Conjugate Vaccine
Rotavirus	Rotavirus [vaccine]
Influenza	Seasonal Influenza [vaccine]
HepA	Hepatitis A [vaccine]

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# Section I: Project Overview

## Methods

### Study Design

The annual Georgia Immunization Study (GIS) employs a retrospective cohort research design to ascertain the up-to-date (UTD) immunization rates for 2-year-old children born in the State of Georgia. Immunization history data for cohorts of children who turned two in January, 2016 from 18 Health Districts, were analyzed to calculate these rates. Identifying information was obtained from electronic birth records, and immunization history data were collected primarily via the Georgia Registry of Immunization Transactions and Services (GRITS). Immunization rates for the 4:3:1:3:3:1:4 vaccine series (4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 Hepatitis B, 1 Varicella and 4 PCV vaccine doses) were based on the childhood immunization and catch-up schedules recommended by the Advisory Committee on Immunization Practices (ACIP) in 2014.

During the six-month data collection period, each immunization date was compared to the child's birth date to determine whether it was administered before or after 24 months of age. If all of the 4:3:1:3:3:1:4 series dates occurred before the child reached 24 months of age or if the series was completed according to the ACIP catch-up schedule guidance, the child was classified as up-to-date by 24 months. Children were excluded from the up-to-date by 24 months classification if at least one of the 4:3:1:3:3:1:4 dates occurred after the child reached 24 months of age and did not meet the catch-up schedule recommendations.

A distinction was made between "UTD by 24 months" and "UTD by end of data collection" because the data collection process, which involved contact with each child's parent and healthcare provider, indirectly served as a reminder-recall system. Many of the parents of study participants were simply unaware that their child was not current on their immunizations; therefore, the difference between the percentage of children *UTD by 24 months* and children *UTD by end of data collection* may be a proxy measure of the impact of parent and provider contact in raising immunization rates.

The third rate calculated, *UTD by 24 months based on GRITS alone*, served to ascertain how accurately GRITS data reflect UTD immunization rates by 24 months of age, without parent/provider contact.

All of the UTD immunization rates (*UTD based on GRITS alone*, *UTD by 24 months* and *UTD by end of data collection*) were calculated for the state sample and the District samples, as well as for demographic groups within these samples.

### Target and Sample Populations

The target population of the 2016 GIS included all 24-month-old children born in the State of Georgia in 2014. A sample of 2,742 children born in the month of January 2014 was selected for the study. The sample design allowed for independent estimates to be calculated for each of the 18 Health Districts in the state. The final sample estimate for the state was based on weighted data to account for differential probabilities of selection for each Health District and selected from the total number of statewide births during the month of January, 2014. The number of children randomly selected from each District depended on number of births, response rates and District immunization rates from the previous year's GIS. Information for each child, including birth certificate data, was collected. Examples of the type of birth certificate information obtained for each child included:

- Child's first, middle and last name
- Child's gender
- Child's date of birth
- Mother's residential and mailing address(es)
- Mother's residential County
- Mother's first, middle and last name
- Father's first, middle and last name (if available)
- Mother's race and ethnicity
- Mother's level of education
- Mother's marital status
- Mother's age

Other demographic variables used in the analysis, such as Provider Type and Number of Providers, were obtained from GRITS. The WIC enrollment variable was collected for each child by matching the names and dates of birth for all of the sample children with WIC enrollment data. If a child was found to be enrolled in WIC for any amount of time during their first 24 months of life, they were designated as "enrolled in WIC".

Provider-related variables were compiled using GRITS data. When the data were originally collected, the number of providers was recorded. Each child was classified as having "One", "Two", or "Three or more" providers.

The "Provider Type" variable was determined based on the location where each individual vaccine was administered (see Part III: Immunization History, below). If a child received vaccines exclusively in private provider offices, the child was classified as "Private Sector Only." If a child received vaccines exclusively in public health clinics, the child was classified as "Public Sector Only." If a child received vaccines in both private provider offices and public health clinics, the child was classified as "Both private and public sector."

## Data Collection

An electronic web-based data collection system named “TWOY” was used to systematically collect the required information for each child. The TWOY system follows 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 TWOY data collection system contains six distinct sections to be completed by the public health data collectors: Child, Medicaid Eligibility, Notes, Guardians, Providers and VX List (Immunization History).

Data collection was carried out by County and District Public Health Nurses. Data collectors in each Health District participated in training via conference call at the start of the data collection period. A training manual was also provided and made available on the TWOY log-in screen.

### Data Collection Protocol

*Step #1: Search for immunization records at state and local health departments.*

Before the data collection process began, birth certificate information for each child in the sample was loaded into TWOY. This demographic information was used to query GRITS and return the vaccination records for the sample. If a child was up-to-date (UTD) at this point, the child was listed as “Complete, Based on Initial GRITS Record,” and no longer required follow-up. If a child was *not* UTD at this point, the data collection process was passed to the District staff, with the dates found in GRITS already entered into the TWOY system. Next, data collectors reviewed GRITS records or health department records for additional immunization history. If the child’s immunization record was still incomplete, the data collectors proceeded to Steps 2 and 3.

*Step #2: Search for immunization records by contacting the parent(s) and/or guardian(s).*

In this step, data collectors used the contact information from the birth certificate or any updated contact information found at the health department, provider’s office or in GRITS to contact the child’s parent/guardian.

Parents were then contacted by phone and/or by letter and asked to provide an immunization history or the location of immunization information for their child (i.e., the name of the doctor or clinic office). In some cases, representatives made home visits to collect data.

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

Data collectors contacted private physicians by phone or fax and requested the child’s immunization history. Most physicians preferred to respond by updating the child’s immunization history in GRITS. In some cases, providers preferred to communicate by phone, fax or office visit.

*Step #4: Data returned to State Epidemiology office and checked for accuracy.*

Using the TWOY system, data collectors completed follow up on all children by the end of the six-month data collection period. All completed records were reviewed by the Principal Investigator throughout the process. Attempts were made to resolve any unclear information before data cleaning.

### Data Analysis

The 2016 data analysis methods were similar to those employed in 2015. Data cleaning and analysis was done using SAS 9.4 and R (ver. 3.3.2) software.

Demographic variables were used to determine which demographic groups were more or less often *UTD by 24 months*. UTD immunization rates for demographic groups were assessed at both the State and District levels.

Up-to-date (UTD) immunization rates were calculated using each individual vaccine date for each participant. An immunization was classified as given prior to the 24 month birthday if the difference between the dose date and the child’s DOB was equal to or less than 24 months; this was the case even for dates that were not originally found in the child’s GRITS record. For a child to be considered UTD by 24 months, all of the doses in the 4:3:1:3:3:1:4 series had to be given within 24 months of the child’s birth date or had to meet the ACIP catch-up conditions by 24 months. To account for possible scheduling delays by physician office staff, a 2-week grace period was applied to the 24-month calculations.

Margins of error are provided for most rate estimates. The margin of error is a convenient notation of the 95% confidence interval range, for example,  $82.1 \pm 1.4$  represents the confidence interval (80.7, 83.5) for the statewide UTD by 24 months estimate of 82.1%. Where appropriate, overlapping confidence intervals are noted, indicating a notable difference in rates but not necessarily a significant difference because statistical testing was not performed.

Significance testing for the effect of WIC enrollment on UTD by 24 months was performed using R (ver 3.3.2, *stats* package), utilizing a 2 sample test for equality of proportions.

## Limitations

The following describe important limitations of the study that should be considered when interpreting its findings:

A. There were three limitations related to sampling:

- 1) Although the study included a random sample of children born in Georgia during January 2014 and, thus, represented a fair estimate of immunization rates for all 2-year-olds born in 2014, it could not account for variations that may routinely occur in other months of the year.
- 2) 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.
- 3) There may be children in the eligible sample who were erroneously included in the eligible sample and listed as unable-to-locate. Examples of this type of error would be cases where a child died, was adopted, or was part of a military family, but the child's ineligibility related to these circumstances never became known to the public health data collectors because the child could not be found.

B. Response rates for each District are included on the first and second pages of all District reports. Response rate is calculated by subtracting the number of "Unable to Locate" children by the number of eligible participants and then dividing by the number of eligible participants. Caution should be taken when interpreting immunization rates for a District with a low response rate. The reason for this necessary caution is that the children who are unable-to-locate could also be the least UTD. However, we cannot use their immunization history without knowing that it is current, so they must be excluded. Table 2 (pg. 13) shows how the response rate was calculated for the state sample; this same method was used for each of the Health District samples.

C. Maternal race was used as a demographic variable in the analysis but some race categories were not used in analyses due to an insufficient number of participants. The categories included in analysis were:

- White (n=1440)
- Black or African American (n=822)
- Asian (n=82)
- Multiracial (n=71)



## Section II: Statewide Results

State-Level Immunization Study Staff, 2016 Georgia Immunization Study

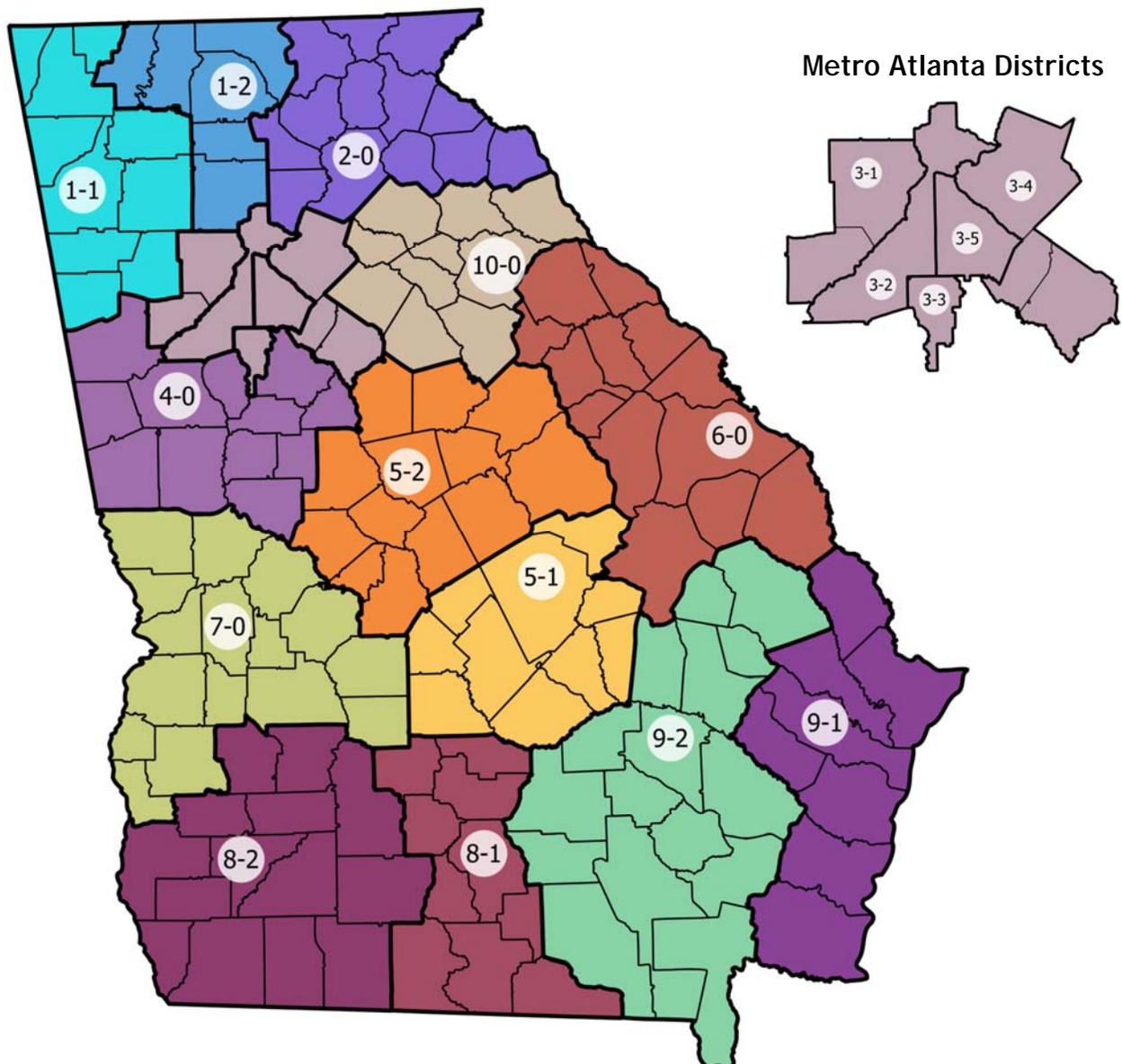
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Figure 1: Georgia Health Districts



# State of Georgia

## Immunization Rates

The up-to-date (UTD) immunization rates based on GRITS alone, by 24 months, and by the end of data collection were calculated using the ACIP's 4:3:1:3:3:1:4 vaccination schedule and catch-up schedule. Individual antigen vaccination rates were calculated using the same ACIP guidance. The estimate for the percent UTD for the combination series and individual antigens are displayed on Table 1 along with the accompanying margin of error. Rates that decreased are shown in red in Table 1 and Figure 2. Rates with confidence intervals that did not overlap with the 2016 rates are *italicized and bolded* in Table 1. Although significance testing was not performed, these differences may be noteworthy.

Statewide, the UTD immunization rate by 24 months of age was estimated at 82.1%, which was lower than in 2015 (82.7%). The UTD immunization rate based on GRITS alone was 76.5%, lower than the 2015 rate (79.7%). The immunization rate by end of data collection was 91.0%, which was lower than the rate in 2015 (91.8%).

Several of the vaccine specific rates decreased slightly from the previous year. Notable changes include a decrease of 3.2 percentage points for Hib vaccination and an increase of 1.9 percentage points for MMR vaccination. Note that the confidence intervals for Hib rates were not overlapping, suggesting a notable change from 2015 to 2016.

The UTD immunization rates and rates by individual antigen from 2010 to 2016 are shown in Figure 2.

**Table 1: Immunization Rates by Series and Vaccine Antigen, Georgia, 2016**

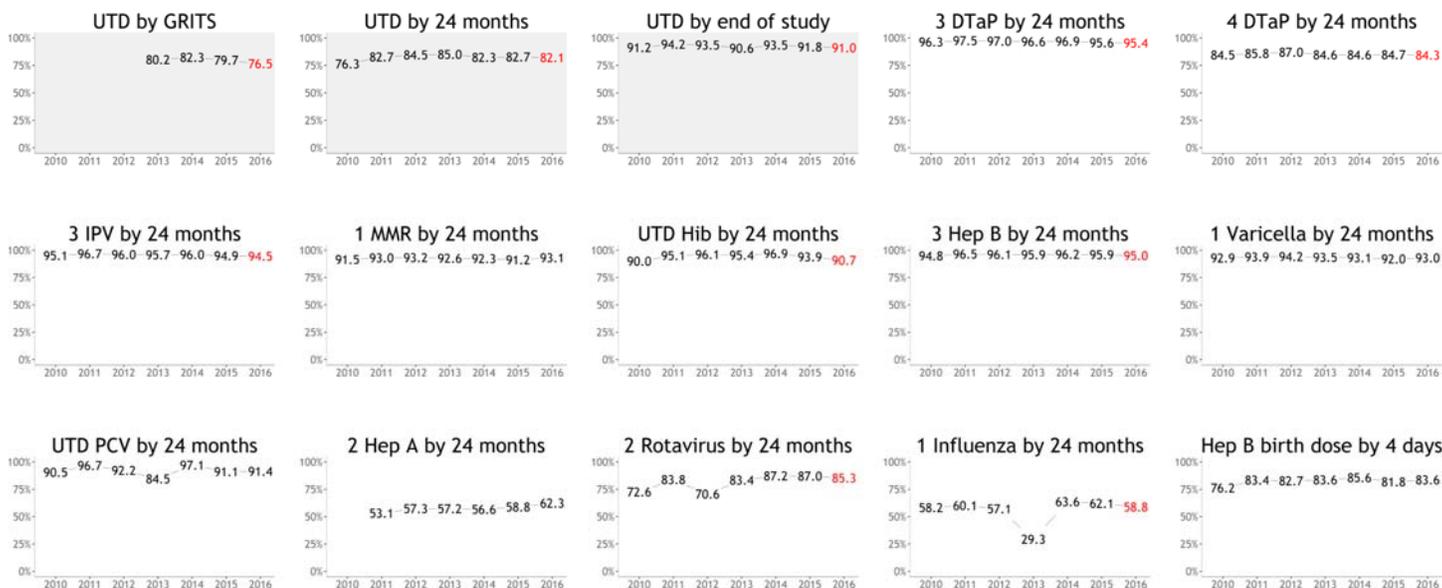
	2015 n = 2,002 (%)	2016 n = 2,464 (%)
UTD immunization rate based on GRITS alone*	79.7 ± 1.8	<b>76.5 ± 1.6</b>
UTD immunization rate by 24 months*	82.7 ± 1.7	<b>82.1 ± 1.4</b>
UTD immunization rate by end of data collection*†	91.8 ± 1.2	<b>91.0 ± 1.1</b>
3 DTaP by 24 months	95.6 ± 0.9	<b>95.4 ± 0.8</b>
4 DTaP by 24 months	84.7 ± 1.6	<b>84.3 ± 1.3</b>
3 IPV by 24 months	94.9 ± 1.0	<b>94.5 ± 0.9</b>
1 MMR by 24 months	91.2 ± 1.2	93.1 ± 0.9
UTD Hib by 24 months*	<b>93.9 ± 1.1</b>	<b>90.7 ± 1.1</b>
3 Hep B by 24 months	95.9 ± 0.9	<b>95.0 ± 0.8</b>
1 Varicella by 24 months	92.0 ± 1.2	93.0 ± 1.0
UTD PCV by 24 months*	91.1 ± 1.3	91.4 ± 1.0
2 Hep A by 24 months	58.8 ± 2.2	62.3 ± 1.8
2 Rotavirus by 24 months	87.0 ± 1.5	<b>85.3 ± 1.3</b>
1+ Influenza by 24 months	62.1 ± 2.1	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	81.8 ± 1.7	83.6 ± 1.4

† Includes children who become UTD during the data collection period  
 \* Includes children up-to-date by ACIP recommended catch-up schedule  
 Red font indicates a rate decrease since 2015  
 Italicized and bolded font indicates that confidence intervals don't overlap with 2016 rate

## Immunization Administration

Statewide, 46,684 vaccine doses were administered to the study sample; 2,589 (5.5%) were administered by public providers and 44,095 (94.4%) were administered by private providers.

**Figure 2: Immunization Rates (%) by Series and Vaccine Antigen, Georgia, 2010-2016**



## Final Sample Determination

The original 2016 GIS sample consisted of 2,742 children born in January 2014 (Table 2). Of these, 215 children were determined to be ineligible for the study. Of those eligible, 63 children were excluded. The final sample of 2,464 children was used to calculate all the immunization rates. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Demographic Findings

The demographic breakdown of the GIS sample (and all Georgia 2014 births), alongside the UTD immunization rates by demographic groups are displayed in Table 3. The results suggest that the following are the least UTD by 24 months (confidence intervals do not overlap with others in the same demographic subgroup):

- Children born to Multiracial or Black/African American mothers
- Children born to mothers that were less than 25 years old at the time of delivery
- Children born to mothers with an education between 9th-11th grade or with a GED at delivery

**Table 2: GIS Sampling Scheme, Georgia, 2016**

	2015	2016
Original sample (n)	2225	2742
Ineligible (n)	159	215
(Refused to participate) (n)	15	12
Eligible sample (n)	2066	2527
Unable to locate <sup>†</sup> (n)	64	63
Final sample (n)	2002	2464
Response rate (%)	96.9	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

- Children born to unmarried mothers at the time of delivery
- Children who were enrolled in WIC
- Children who exclusively visited a public provider or a combination of public and private

UTD by 24 month rates with confidence intervals that do not overlap with other demographic subgroups are ***italicized and bolded*** in Table 3. Although significance testing was not performed, these differences may be noteworthy.

**Table 3: Sample Demographics and Immunization Rates, Georgia, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		GIS Sample ‡ n = 2,464	All 2014 births ‡ N = 126,257	GRITS alone n = 2,464 (%)	24 months n = 2,464 (%)	End of study n = 2,464 (%)
Mother's race*	White	1440 (58.4%)	71816 (56.8%)	78.9 ± 2.0	<b><i>84.6 ± 1.7</i></b>	91.6 ± 1.3
	Black or African-American	822 (33.4%)	43425 (34.4%)	71.8 ± 2.9	<b><i>76.8 ± 2.7</i></b>	89.4 ± 2.0
	Asian	82 (3.3%)	5262 (4.2%)	91.8 ± 4.9	<b><i>96.2 ± 3.2</i></b>	98.9 ± 1.8
	Multiracial	71 (2.9%)	3251 (2.6%)	67.6 ± 10.0	<b><i>72.7 ± 10.0</i></b>	87.3 ± 7.5
Mother's ethnicity*	non-Hispanic	2128 (86.4%)	108034 (85.5%)	75.9 ± 1.7	<b><i>81.6 ± 1.5</i></b>	90.2 ± 1.2
	Hispanic	336 (13.6%)	16709 (13.2%)	80.7 ± 4.0	<b><i>85.1 ± 3.6</i></b>	95.6 ± 1.9
Mother's age*	<25 years old	822 (33.4%)	40644 (32.2%)	71.6 ± 2.9	<b><i>76.7 ± 2.8</i></b>	88.9 ± 2.1
	25 - 35 years old	1291 (52.4%)	67000 (53.0%)	77.9 ± 2.1	<b><i>83.7 ± 1.9</i></b>	91.8 ± 1.4
	35+ years old	351 (14.2%)	18697 (14.8%)	82.2 ± 3.7	<b><i>87.5 ± 3.2</i></b>	92.4 ± 2.6
Mother's education*	Some college or higher	1220 (49.5%)	67066 (53.1%)	80.3 ± 2.1	<b><i>86.4 ± 1.8</i></b>	92.3 ± 1.4
	High School Graduate/GED	765 (31.0%)	36083 (28.6%)	71.6 ± 3.0	<b><i>76.5 ± 2.8</i></b>	88.6 ± 2.1
	9th - 11th grade	283 (11.5%)	14785 (11.7%)	74.6 ± 4.7	<b><i>78.2 ± 4.5</i></b>	91.4 ± 3.0
	<9th grade	97 (3.9%)	4889 (3.9%)	89.1 ± 5.6	<b><i>91.8 ± 4.6</i></b>	97.6 ± 2.5
Marital status*	Married	1281 (52.0%)	68308 (54.1%)	81.3 ± 2.0	<b><i>86.3 ± 1.7</i></b>	91.3 ± 1.5
	Unmarried	1162 (47.2%)	57570 (45.6%)	71.8 ± 2.4	<b><i>77.7 ± 2.2</i></b>	90.8 ± 1.6
Child's WIC status	WIC	1439 (58.4%)		74.7 ± 2.1	<b><i>78.8 ± 2.0</i></b>	90.7 ± 1.4
	non-WIC	1025 (41.6%)		78.8 ± 2.3	<b><i>86.2 ± 2.0</i></b>	91.3 ± 1.6
Number of provider(s) visited	One	1434 (58.2%)		81.3 ± 1.9	85.4 ± 1.7	92.5 ± 1.3
	Two	740 (30.0%)		73.8 ± 2.9	81.1 ± 2.6	93.4 ± 1.6
	Three or more	216 (8.8%)		73.6 ± 5.6	80.5 ± 5.1	92.6 ± 3.4
Type of provider(s) visited	Private	2032 (82.5%)		80.6 ± 1.6	<b><i>86.1 ± 1.4</i></b>	93.6 ± 1.0
	Public	33 (1.3%)		55.8 ± 16.0	<b><i>55.8 ± 16.0</i></b>	75.3 ± 14.0
	Both	325 (13.2%)		65.0 ± 4.8	<b><i>69.8 ± 4.6</i></b>	89.1 ± 3.1

‡ Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

***Italicized and bolded font indicates that confidence intervals don't overlap***

## Medicaid and UTD Status

Children whose vaccines are covered by Medicaid during the first year of life must have their Medicaid status renewed annually. The relationship between Medicaid status in the second year of life and UTD immunization status at 24 months was examined to determine if a discontinuation of Medicaid coverage in the second year of life contributed to lower immunization rates, particularly for vaccine doses given in the second year of life, such as the fourth DTaP dose.

Medicaid eligibility, entered into GRITS by providers at time of vaccination, was analyzed to determine Medicaid status at time of vaccine administration. Participants were assigned into categories based on their Medicaid coverage (Medicaid both years, first year only, second year only and no Medicaid either year). The first year of life was defined as starting from the day of birth until the end of the month of the first birthday (for this study cohort, January 31, 2015). The second year of life was defined as starting on the month after the first birthday (February 1, 2015) until the second birthday.

The UTD rate by 24 months (57.3%) and by end of data collection (78.2%) for children who were covered by Medicaid the first year only were much lower than any of the other categories, including those not covered by Medicaid either year (Table 4).

Selected vaccinations were analyzed to determine if Medicaid status impacted the vaccination rates at 12 and 24 months of age. The vaccination rates for Varicella and MMR, typically administered at 12 months, and the 4th DTaP dose, typically administered at 15 months, by Medicaid Status, are presented in Table 5. At 12 months of age, these vaccination rates did not differ greatly based on Medicaid status. At 24 months, greater differences can be observed between the Medicaid status categories. In general, those whose Medicaid coverage did not continue during the second year of life were the least likely to be UTD for each of the selected vaccines. A graphical presentation of these differences is shown in Figure 3.

## Medicaid and not UTD Status

A total of 444 children were identified as not UTD at 24 months of age. Of these, 323 (73%) had immunizations covered by Medicaid during their first year of life. Of those, 169 (52%) remained on Medicaid during the second year of life and 154 (48%) did not. Data collectors attempted to determine, via parental interviews, why these children were not enrolled in Medicaid the second year of life (Table 6). Data collectors were unable to interview the majority of parents. Of those they were able to interview, the majority said they were not eligible for Medicaid as the reason why they didn't renew their Medicaid.

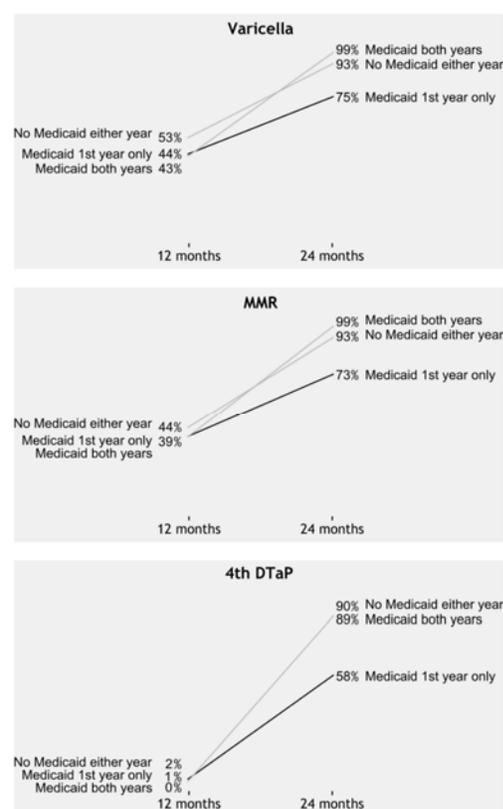
**Table 4: UTD by Medicaid Status, Georgia, 2016**

<i>Medicaid Status</i>	<i>n (%)</i>	<i>UTD by 24 months</i>	<i>UTD by end of study</i>
Medicaid both years	1226 (49.8)	86.0%	95.0%
Medicaid 1st year only	363 (14.7)	<b>57.3%</b>	<b>78.2%</b>
Medicaid 2nd year only	68 (2.8)	79.0%	89.8%
No Medicaid either year	807 (32.8)	86.9%	90.6%
State	2464 (100)	82.1%	91.0%

**Table 5: UTD by 12 and 24 months by Vaccine Antigen and Medicaid Status, Georgia, 2016**

	<i>Medicaid Status</i>	<i>n</i>	<i>Varicella</i>	<i>MMR</i>	<i>4th DTaP</i>
UTD at 12 months	Medicaid both years	1226	43.2%	38.6%	0.4%
	Medicaid 1st year only	363	44.1%	38.6%	2.5%
	No Medicaid either year	807	52.8%	44.4%	1.1%
UTD at 24 months	Medicaid both years	1226	98.8%	98.9%	88.6%
	Medicaid 1st year only	363	<b>75.5%</b>	<b>73.3%</b>	<b>58.4%</b>
	No Medicaid either year	807	92.6%	93.2%	89.7%

**Figure 3: UTD by 12 and 24 months by Vaccine Antigen and Medicaid Status, Georgia, 2016**



**Table 6: Reason for lapse in Medicaid status during second year of life among those not UTD by 24 months, Georgia, 2016**

<i>Reason</i>	<i>n (%)</i>
Eligible - but did not recertify	5 (3)
Not Eligible - currently not insured	3 (2)
Not Eligible - insured elsewhere	10 (6)
Unknown - contact with uninformed family member	1 (1)
Unknown - unable to contact anyone in household	11 (7)
Missing or couldn't contact parents	124 (81)

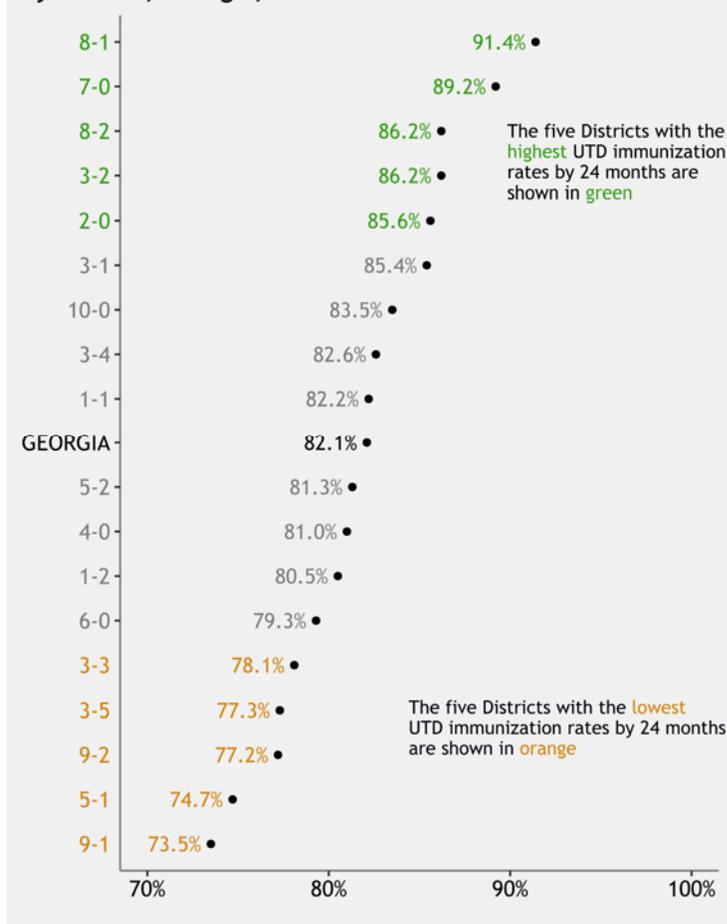
## District Immunization Rates

State-wide, the UTD immunization coverage rate by 24 months was 82.1%. This rate varied per District ranging from 73.5% to 91.4%. The five Districts with the highest UTD immunization rates by 24 months are shown in green, while the five Districts with the lowest UTD immunization rates by 24 months are shown in orange (Figure 4 and Table 7).

Response rates for each District are included on the second page of all District reports (Section III). Caution should be taken when interpreting immunization rates for a District with a low response rate because children who were classified as unable-to-locate could also be the least UTD, but must be excluded.

Note that the difference between coverage rates based on GRITS alone and up-to-date at 24 months of age is an indicator of how accurate GRITS records reflect these rates. Physician practices should be encouraged to utilize GRITS for immunization documentation to maintain its accuracy and thereby value.

**Figure 4: UTD by 24 months Immunization Rates by District, Georgia, 2016**



**Table 7: District UTD Immunization Rates, Georgia, 2016**

District	Final Sample size (n)	UTD GRITS alone (%)	UTD by 24 months (%)	UTD by End of study (%)
1-1 Northwest (Rome)	169	81.1 ± 4.8	82.2 ± 4.7	89.9 ± 3.7
1-2 North Georgia (Dalton)	159	78.6 ± 5.1	80.5 ± 4.9	91.2 ± 3.5
2-0 North (Gainesville)	153	83.0 ± 5.1	85.6 ± 4.8	93.5 ± 3.3
3-1 Cobb-Douglas	164	79.3 ± 5.6	85.4 ± 4.9	95.1 ± 3.0
3-2 Fulton	159	84.3 ± 5.2	86.2 ± 5.0	92.5 ± 3.8
3-3 Clayton	96	69.8 ± 7.8	78.1 ± 7.0	92.7 ± 4.4
3-4 Gwinnett, Newton, Rockdale (GNR)	172	82.6 ± 5.2	82.6 ± 5.2	91.9 ± 3.8
3-5 DeKalb	220	74.1 ± 5.1	77.3 ± 4.8	89.1 ± 3.6
4-0 LaGrange	184	81.0 ± 5.0	81.0 ± 5.0	86.4 ± 4.4
5-1 South Central (Dublin)	75	74.7 ± 5.8	74.7 ± 5.8	86.7 ± 4.6
5-2 North Central (Macon)	123	76.4 ± 6.6	81.3 ± 6.1	86.2 ± 5.4
6-0 East Central (Augusta)	140	78.6 ± 5.9	79.3 ± 5.8	92.1 ± 3.9
7-0 West Central (Columbus)	102	80.4 ± 6.6	89.2 ± 5.1	96.1 ± 3.2
8-1 South (Valdosta)	93	91.4 ± 4.7	91.4 ± 4.7	96.8 ± 3.0
8-2 Southwest (Albany)	109	86.2 ± 5.4	86.2 ± 5.4	89.9 ± 4.7
9-1 Coastal (Savannah)	83	73.5 ± 8.9	73.5 ± 8.9	81.9 ± 7.7
9-2 Southeast (Waycross)	136	77.2 ± 5.7	77.2 ± 5.7	94.1 ± 3.2
10-0 Northeast (Athens)	127	82.7 ± 5.6	83.5 ± 5.5	92.9 ± 3.8
<b>Georgia</b>	<b>2,464</b>	<b>79.9 ± 1.5</b>	<b>82.1 ± 1.4</b>	<b>91.0 ± 1.1</b>

The five Districts with the highest UTD immunization rates by 24 months are shown in green  
The five Districts with the lowest UTD immunization rates by 24 months are shown in orange

### Immunization Success Measures by Health District

This study is conducted at the state level and allows for uniform data analysis covering all of the 18 Health Districts in Georgia. Key measures can be very telling of an individual Health District's success in achieving high UTD rates by 24 months of age among their childhood population.

Please refer to Table 8 for a list of these success measures and the first, second, and third-placing Health Districts as applicable to each measure.

The top portion of the table addresses the Districts who had the highest immunization coverage rates and response rates as well as one-year increases. Some of these measures represent an average over a five-year span and some are only relative to 2016 results.

The lower portion of the table addresses the vaccine antigen-specific coverage rates by 24 months and only includes 2016 results.

Congratulations to all of the District Immunization Champions - those ranking in the top three for any of the categories!

**Table 8: District Immunization Champions, Georgia, 2016**

<i>Category</i>	<i>District(s) in 1st Place</i>	<i>District(s) in 2nd Place</i>	<i>District(s) in 3rd Place</i>	<i>State</i>
Highest Response Rate	7-0, 8-1 and 10-0 100%	1-2 and 2-0 99.4%	1-1 98.8%	97.5%
Highest UTD by 24 months	8-1 91.4%	7-0 89.2%	3-2 and 8-2 86.2%	82.1%
Highest UTD by 24 months, based on GRITS alone	8-1 90.3%	10-0 82.7%	3-2 81.1%	76.5%
Highest UTD by end of data collection	8-1 96.8%	7-0 96.1%	3-1 95.1%	91.0%
Greatest Increase in UTD by 24 months from 2015 to 2016	2-0 +6.9%	1-2 +5.1%	5-1 and 7-0 +3.9%	-0.6%
Greatest Increase in UTD from 24 months to end of data collection	9-2 16.9%	3-3 14.6%	6-0 12.8%	+8.9%
Highest Coverage <b>by 24 months</b> : 4+ DTaP Doses	8-1 91.4%	7-0 90.2%	2-0 88.9%	84.3%
Highest Coverage <b>by 24 months</b> : 3+ Polio Doses	9-2 97.8%	8-1 97.8%	2-0 and 3-3 96.9%	94.5%
Highest Coverage <b>by 24 months</b> : 1 MMR Dose	8-1 97.8%	3-1 and 10-0 97.6%	7-0 96.1%	93.1%
Highest Coverage <b>by 24 months</b> : UTD Hib	8-1 96.8%	3-1 and 7-0 95.1%	2-0 94.1%	90.7%
Highest Coverage <b>by 24 months</b> : 3+ Hepatitis B Doses	6-0 99.3%	8-1 98.9%	8-2 98.2%	95.0%
Highest Coverage <b>by 24 months</b> : 1 Varicella Dose	8-1 97.8%	10-0 96.9%	3-1 96.3%	93.0%
Highest Coverage <b>by 24 months</b> : UTD PCV	3-1 96.3%	7-0 96.1%	8-1 94.6%	91.4%
Highest Coverage <b>by 24 months</b> : 2+ Hepatitis A Doses	8-1 75.3%	3-1 71.3%	7-0 70.6%	62.3%
Highest Coverage: Hepatitis B Birth Dose <b>by 4 days old</b>	8-1 97.8%	5-1 96.0%	9-2 94.9%	83.6%

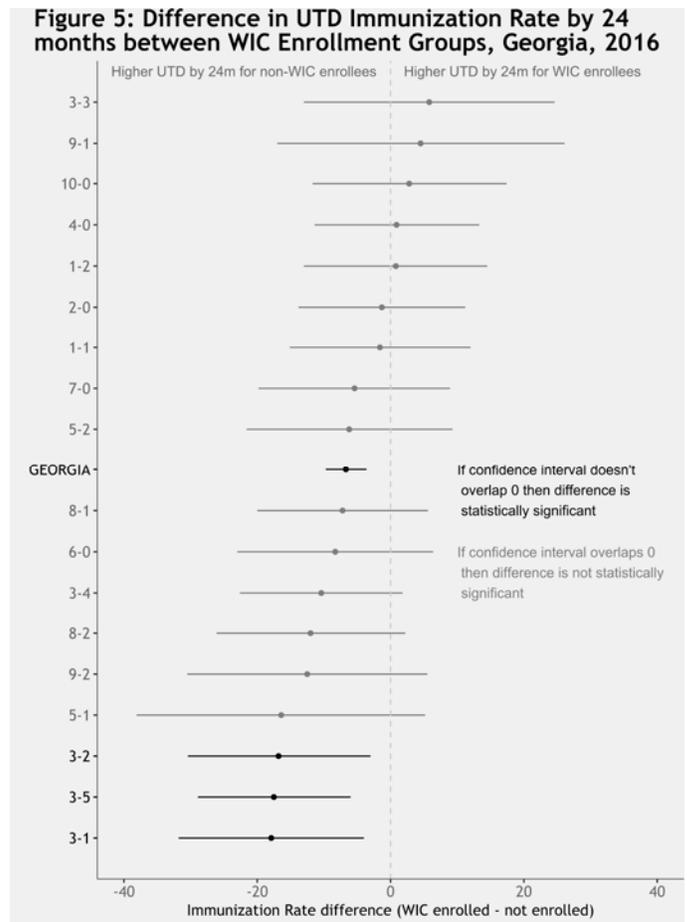
### WIC Enrollment Immunization Rates

The difference in UTD immunization rate by 24 months between WIC-enrolled children and those not enrolled in WIC are shown in Table 9 for each District. The confidence intervals for these rates are graphed in Figure 5. Confidence intervals that do not overlap zero are **bolded** in Table 9 and shown in black in Figure 5.

Statewide, a significant difference was found between WIC enrollees and non-enrollees. Children enrolled in WIC had a lower UTD by 24 months immunization rate (78.8%) than those not enrolled in WIC (86.2%).

Significant differences were found between WIC enrollees and non-enrollees in Districts 3-1, 3-2 and 3-5. In all of these Districts, children who were enrolled in WIC had lower UTD by 24 month immunization rates than those that were not enrolled in WIC.

Immunization campaigns will vary by District based on demographic differences. Findings from this report may be useful in generating ideas for effective strategies.



**Table 9: Difference in UTD Immunization Rate by 24 months between WIC Enrollment Groups, Georgia, 2016**

District	Immunization Rate for children enrolled in WIC	Immunization Rate for children not enrolled in WIC	Immunization Rate difference (WIC enrolled - not enrolled)	95% Confidence Interval of difference
1-1 Northwest (Rome)	81.7%	83.3%	-1.6%	-15.1% - 12.0%
1-2 North Georgia (Dalton)	80.8%	80.0%	0.8%	-13.0% - 14.5%
2-0 North (Gainesville)	85.1%	86.4%	-1.3%	-13.8% - 11.2%
<b>3-1 Cobb-Douglas</b>	<b>73.7%</b>	<b>91.6%</b>	<b>-17.9%</b>	<b>-31.8% - -4.0%</b>
<b>3-2 Fulton</b>	<b>75.4%</b>	<b>92.2%</b>	<b>-16.8%</b>	<b>-30.4% - -3.0%</b>
3-3 Clayton	80.8%	75.0%	5.8%	-13.0% - 24.6%
3-4 Gwinnett, Newton, Rockdale (GNR)	77.9%	88.3%	-10.4%	-22.6% - 1.8%
<b>3-5 DeKalb</b>	<b>69.4%</b>	<b>86.9%</b>	<b>-17.5%</b>	<b>-28.9% - -6.0%</b>
4-0 LaGrange	81.4%	80.5%	0.9%	-11.4% - 13.3%
5-1 South Central (Dublin)	68.8%	85.2%	-16.4%	-38.1% - 5.2%
5-2 North Central (Macon)	78.9%	85.1%	-6.2%	-21.6% - 9.3%
6-0 East Central (Augusta)	75.9%	84.2%	-8.3%	-23.0% - 6.4%
7-0 West Central (Columbus)	87.7%	93.1%	-5.4%	-19.8% - 8.9%
8-1 South (Valdosta)	89.2%	96.4%	-7.2%	-20.0% - 5.6%
8-2 Southwest (Albany)	83.7%	95.7%	-12.0%	-26.1% - 2.2%
9-1 Coastal (Savannah)	75.6%	71.1%	4.5%	-17.0% - 26.1%
9-2 Southeast (Waycross)	75.0%	87.5%	-12.5%	-30.5% - 5.5%
10-0 Northeast (Athens)	84.8%	82.0%	2.8%	-11.7% - 17.4%
<b>Georgia</b>	<b>79.2%</b>	<b>85.9%</b>	<b>-6.7%</b>	<b>-9.7% - -3.6%</b>

Bolded font indicates that the 95% confidence interval does not overlap 0 and that the difference in WIC groups is significant



## Section III: Health District Immunization Reports

### Immunization Study Teams by District, Georgia Immunization Study, 2016

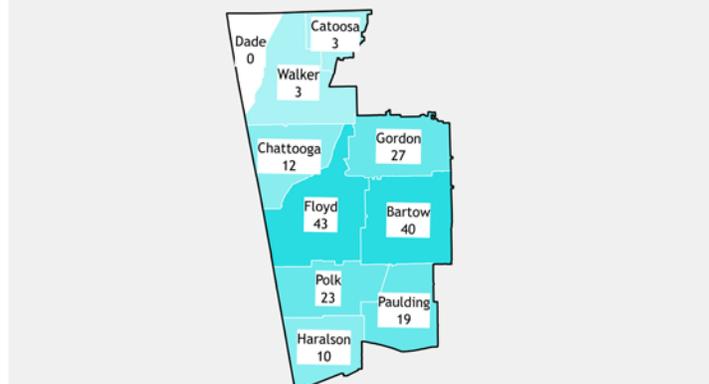
1-1	Janet Eberhart, RN, BSN	Immunization Coordinator
1-2	Marie Smith, RN, BSN Denise Bowman, RN Angie Callaway, RN, BSN Graham Erwood, RN Pamela Graham, LPN	Immunization Coordinator
2-0	Connee Martin, RN, BSN Sandy Moore, LPN	Immunization Coordinator
3-1	Priti Kolhe Marlene Albert	Immunization Coordinator
3-2	Georgia Goseer, RN	Immunization Coordinator
3-3	Sandra Metcalf, RN, BSN, MPH Tawana Evans-Philips Nina Posley, LPN	Immunization Coordinator
3-4	Gloria Melvin LaToya Porter, LPN	Immunization Coordinator
3-5	Jotonna Tulloch, BS Angela Black Angela Bines	Immunization Coordinator
4-0	Amy Fenn, RN, BSN	Immunization Coordinator
5-1	Patty Portwood, BS, M. Ed Jina Adams, RN, MSN Rachel Baggett Shakira Brown Brenda Churchwell Bridgette Clements Terri Griffin, RN, BSN Tina Scarborough Amy Tanner, RN Suzanne Usher, RN Brenda Williams, RN Kristen Wilson, RN, BSN Joni Wilson	Immunization Coordinator
5-2	Judy McChargue, RN	Immunization Coordinator
6-0	Susan Edmunds, RN	Immunization Coordinator
7-0	Cathy Henderson, RN	Immunization Coordinator
8-1	Reomona Thomas, RN, MSN Kenneth Lowery	Immunization Coordinator
8-2	Rebecca Snow, LPN Sandra Palmer	Immunization Coordinator
9-1	Paige Lightsey, RN	Immunization Coordinator
9-2	Kay Davis, RN, MSN	Immunization Coordinator
10-0	Dionne Hansey	Immunization Coordinator

# District 1-1

Figure 1-1-A: Location of District 1-1



Figure 1-1-B: Sampling per County, District 1-1, 2016



## Final Sample Determination

The original 2016 GIS sample for District 1-1 consisted of 180 children born in January of 2014 (Table 1-1-A). Of these, 9 children were determined to be ineligible for the study. Of those eligible, 2 children were unable to be located and were therefore excluded. The final sample size for District 1-1, which was used to calculate all rates, was 169. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 1-1, the UTD immunization rate by 24 months of age was 82.2%, which was slightly higher than the 2015 rate (81.1%) and the state average (82.1%) (Table 1-1-B). The UTD immunization rate based on GRITS alone was 76.9%, lower than the 2015 rate (80.4%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 89.9%, which was lower than the 2015 rate (91.6%) and the state average (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 1-1-B and Figure 1-1-C). Rates that decreased in 2016 are shown as **red** in Table 1-1-B and Figure 1-1-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 1-1-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 3,107 vaccines doses administered to the District 1-1 cohort, 227 (7.3%) were administered by public health providers and 2,880 (92.7%) were administered by private providers.

Table 1-1-A: GIS Sampling Scheme, District 1-1, 2016

	2015	2016	State 2016
Original sample (n)	150	180	2742
Ineligible (n)	2	9	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	148	171	2527
Unable to locate <sup>†</sup> (n)	5	2	63
Final sample (n)	143	169	2464
Response rate (%)	96.6	98.8	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 1-1-B: Immunization Rates by Series and Vaccine Antigen, District 1-1, 2016

	2015 n = 143 (%)	2016 n = 169 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	80.4 ± 6.5	<b>76.9 ± 5.2</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	81.1 ± 6.4	82.2 ± 4.7	82.1 ± 1.4
UTD immunization rate* by end of data collection <sup>†</sup>	91.6 ± 4.6	<b>89.9 ± 3.7</b>	91.0 ± 1.1
3 DTaP by 24 months	94.4 ± 3.8	94.7 ± 2.8	95.4 ± 0.8
4 DTaP by 24 months	82.5 ± 6.2	<b>82.2 ± 4.7</b>	84.3 ± 1.3
3 IPV by 24 months	93.7 ± 4.0	94.1 ± 2.9	94.5 ± 0.9
1 MMR by 24 months	88.8 ± 5.2	94.1 ± 2.9	93.1 ± 0.9
UTD Hib by 24 months	93.0 ± 4.2	<b>86.4 ± 4.2</b>	90.7 ± 1.1
3 Hep B by 24 months	95.1 ± 3.5	95.3 ± 2.6	95.0 ± 0.8
1 Varicella by 24 months	89.5 ± 5.0	93.5 ± 3.0	93.0 ± 1.0
UTD PCV by 24 months	89.5 ± 5.0	<b>88.8 ± 3.9</b>	91.4 ± 1.0
2 Hep A by 24 months	53.8 ± 8.2	54.4 ± 6.1	<b>62.3 ± 1.8</b>
2 Rotavirus by 24 months	<b>92.3 ± 4.4</b>	<b>82.8 ± 4.6</b>	85.3 ± 1.3
1+ Influenza by 24 months	<b>64.3 ± 7.9</b>	<b>47.3 ± 6.2</b>	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	83.9 ± 6.0	84.6 ± 4.4	83.6 ± 1.4

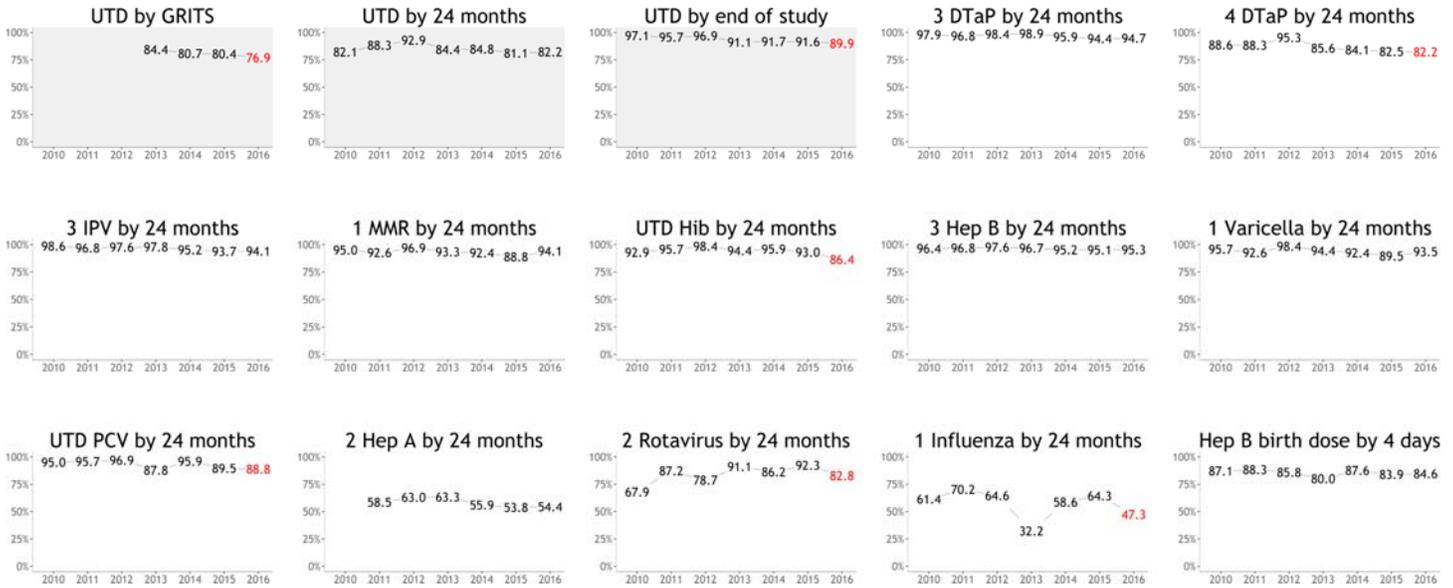
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 1-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 1-1, 2010-2016**



**Demographic Findings**

The demographic breakdown of the District 1-1 sample (and all District 1-1 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 1-1-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 1-1.

**Table 1-1-C: District 1-1 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		1-1 Sample † n = 169	All 2014 births † N = 7,736	GRITS alone n = 169 (%)	24 months n = 169 (%)	End of study n = 169 (%)
Mother's race*	White	135 (79.9%)	6596 (85.3%)	75.6 ± 5.9	82.2 ± 5.3	88.9 ± 4.3
	Black or African-American	24 (14.2%)	828 (10.7%)	79.2 ± 13.0	79.2 ± 13.0	91.7 ± 9.0
	Asian	2 (1.2%)	83 (1.1%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	7 (4.1%)	148 (1.9%)	85.7 ± 21.0	85.7 ± 21.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	147 (87.0%)	6918 (89.4%)	75.5 ± 5.7	81.0 ± 5.2	89.1 ± 4.1
	Hispanic	22 (13.0%)	782 (10.1%)	86.4 ± 12.0	90.9 ± 9.8	95.5 ± 7.1
Mother's age*	<25 years old	68 (40.2%)	2966 (38.3%)	77.9 ± 8.1	85.3 ± 6.9	91.2 ± 5.5
	25 - 35 years old	88 (52.1%)	3957 (51.2%)	75.0 ± 7.4	79.5 ± 6.9	88.6 ± 5.4
	35+ years old	13 (7.7%)	813 (10.5%)	84.6 ± 16.0	84.6 ± 16.0	92.3 ± 12.0
Mother's education*	Some college or higher	63 (37.3%)	3639 (47.0%)	79.4 ± 8.2	84.1 ± 7.4	90.5 ± 5.9
	High School Graduate/GED	66 (39.1%)	2572 (33.2%)	75.8 ± 8.5	80.3 ± 7.8	89.4 ± 6.1
	9th - 11th grade	27 (16.0%)	1085 (14.0%)	74.1 ± 14.0	77.8 ± 13.0	85.2 ± 11.0
	<9th grade	10 (5.9%)	335 (4.3%)	90.0 ± 15.0	90.0 ± 15.0	100.0 ± 0.0
Marital status*	Married	87 (51.5%)	4555 (58.9%)	77.0 ± 7.2	82.8 ± 6.5	87.4 ± 5.7
	Unmarried	79 (46.7%)	3149 (40.7%)	78.5 ± 7.4	82.3 ± 6.9	93.7 ± 4.4
Child's WIC status	WIC	115 (68.0%)		76.5 ± 6.3	81.7 ± 5.8	91.3 ± 4.2
	Non-WIC	54 (32.0%)		77.8 ± 9.1	83.3 ± 8.1	87.0 ± 7.3
Number of provider(s) visited	One	102 (60.4%)		81.4 ± 6.2	84.3 ± 5.8	90.2 ± 4.7
	Two	48 (28.4%)		70.8 ± 11.0	83.3 ± 8.6	97.9 ± 3.3
	Three or more	13 (7.7%)		92.3 ± 12.0	92.3 ± 12.0	92.3 ± 12.0
Type of provider(s) visited	Private	137 (81.1%)		82.5 ± 5.2	88.3 ± 4.4	92.7 ± 3.6
	Public	3 (1.8%)		33.3 ± 44.0	33.3 ± 44.0	100.0 ± 0.0
	Both	23 (13.6%)		65.2 ± 16.0	69.6 ± 15.0	91.3 ± 9.4

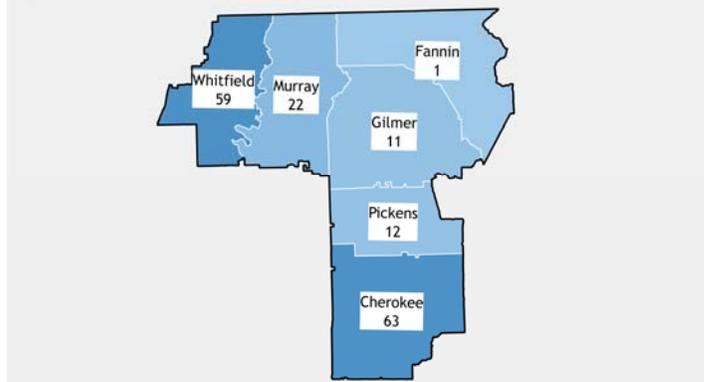
† Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery

# District 1-2

Figure 1-2-A: Location of District 1-2



Figure 1-2-B: Sampling per County, District 1-2, 2016



## Final Sample Determination

The original 2016 GIS sample for District 1-2 consisted of 168 children born in January of 2014 (Table 1-2-A). Of these, 8 children were determined to be ineligible for the study. Of those eligible, 1 child was unable to be located and was therefore excluded. The final sample size for District 1-2, which was used to calculate all rates, was 159. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 1-2, the UTD immunization rate by 24 months of age was 80.5%, which was higher than the 2015 rate (75.4%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 78.0%, higher than the 2015 rate (74.6%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 91.2%, higher than the 2015 rate (89.8%), and the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year and to the state overall (Table 1-2-B and Figure 1-2-C). Rates that decreased in 2016 are shown as **red** in Table 1-2-B and Figure 1-2-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 1-2-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,979 vaccines doses administered to the District 1-2 cohort, 106 (3.6%) were administered by public health providers and 2,873 (96.4%) were administered by private providers.

Table 1-2-A: GIS Sampling Scheme, District 1-2, 2016

	2015	2016	State 2016
Original sample (n)	132	168	2742
Ineligible (n)	11	8	215
(Refused to participate) (n)	3	0	12
Eligible sample (n)	121	160	2527
Unable to locate <sup>†</sup> (n)	3	1	63
Final sample (n)	118	159	2464
Response rate (%)	97.5	99.4	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 1-2-B: Immunization Rates by Series and Vaccine Antigen, District 1-2, 2016

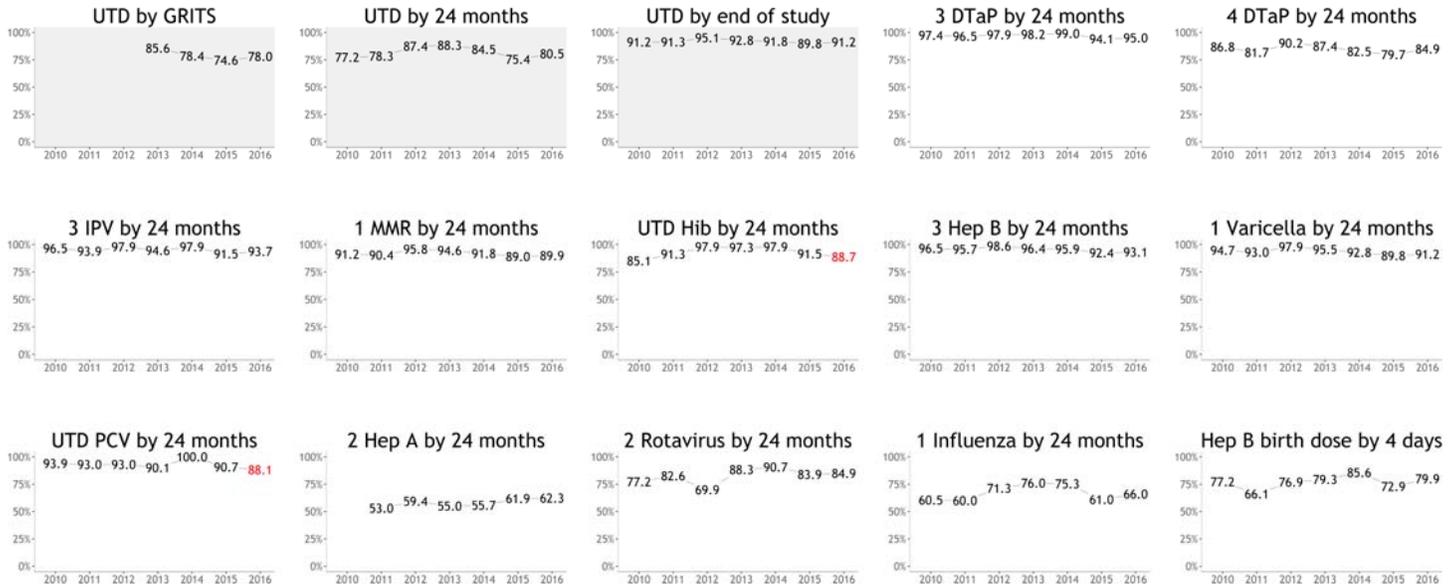
	2015 <i>n = 118</i> (%)	2016 <i>n = 159</i> (%)	State <i>n = 2,464</i> (%)
UTD immunization rate* based on GRITS alone	74.6 ± 7.9	78.0 ± 5.2	76.5 ± 1.6
UTD immunization rate* by 24 months	75.4 ± 7.8	80.5 ± 4.9	82.1 ± 1.4
UTD immunization rate* by end of data collection†	89.8 ± 5.5	91.2 ± 3.5	91.0 ± 1.1
3 DTaP by 24 months	94.1 ± 4.3	95.0 ± 2.7	95.4 ± 0.8
4 DTaP by 24 months	79.7 ± 7.3	84.9 ± 4.5	84.3 ± 1.3
3 IPV by 24 months	91.5 ± 5.0	93.7 ± 3.0	94.5 ± 0.9
1 MMR by 24 months	89.0 ± 5.7	89.9 ± 3.7	93.1 ± 0.9
UTD Hib by 24 months	91.5 ± 5.0	<b>88.7 ± 3.9</b>	90.7 ± 1.1
3 Hep B by 24 months	92.4 ± 4.8	93.1 ± 3.2	95.0 ± 0.8
1 Varicella by 24 months	89.8 ± 5.5	91.2 ± 3.5	93.0 ± 1.0
UTD PCV by 24 months	90.7 ± 5.3	<b>88.1 ± 4.0</b>	91.4 ± 1.0
2 Hep A by 24 months	61.9 ± 8.8	62.3 ± 6.0	62.3 ± 1.8
2 Rotavirus by 24 months	83.9 ± 6.7	84.9 ± 4.5	85.3 ± 1.3
1+ Influenza by 24 months	61.0 ± 8.8	66.0 ± 5.9	58.8 ± 1.8
Hep B birth dose by 4 days	72.9 ± 8.1	79.9 ± 5.0	<b>83.6 ± 1.4</b>

<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 1-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 1-2, 2010-2016**

### Demographic Findings

The demographic breakdown of the District 1-2 sample (and all District 1-2 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 1-2-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 1-2.

**Table 1-2-C: District 1-2 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		1-2 Sample ‡ n = 159	All 2014 births ‡ N = 5,465	GRITS alone n = 159 (%)	24 months n = 159 (%)	End of study n = 159 (%)
Mother's race*	White	152 (95.6%)	4887 (89.4%)	78.3 ± 5.3	80.9 ± 5.0	90.8 ± 3.7
	Black or African-American	2 (1.3%)	283 (5.2%)	50.0 ± 56.0	50.0 ± 56.0	100.0 ± 0.0
	Asian		90 (1.6%)			
	Multiracial	1 (0.6%)	107 (2%)	0.0 ± 0.0	0.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	109 (68.6%)	4188 (76.6%)	75.2 ± 6.5	78.9 ± 6.1	87.2 ± 5.0
	Hispanic	50 (31.4%)	1200 (22.0%)	84.0 ± 8.1	84.0 ± 8.1	100.0 ± 0.0
Mother's age*	<25 years old	60 (37.7%)	1756 (32.1%)	76.7 ± 8.6	78.3 ± 8.4	88.3 ± 6.5
	25 - 35 years old	79 (49.7%)	2913 (53.3%)	79.7 ± 7.1	83.5 ± 6.6	94.9 ± 3.9
	35+ years old	20 (12.6%)	796 (14.6%)	75.0 ± 15.0	75.0 ± 15.0	85.0 ± 13.0
Mother's education*	Some college or higher	57 (35.8%)	2741 (50.2%)	77.2 ± 8.7	80.7 ± 8.2	86.0 ± 7.2
	High School Graduate/GED	51 (32.1%)	1530 (28.0%)	68.6 ± 10.0	72.5 ± 9.8	92.2 ± 5.9
	9th - 11th grade	27 (17.0%)	726 (13.3%)	88.9 ± 9.5	88.9 ± 9.5	92.6 ± 7.9
	<9th grade	11 (6.9%)	280 (5.1%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	99 (62.3%)	3561 (65.2%)	79.8 ± 6.3	81.8 ± 6.1	91.9 ± 4.3
	Unmarried	60 (37.7%)	1890 (34.6%)	75.0 ± 8.8	78.3 ± 8.4	90.0 ± 6.1
Child's WIC status	WIC	104 (65.4%)		78.8 ± 6.3	80.8 ± 6.1	94.2 ± 3.6
	Non-WIC	55 (34.6%)		76.4 ± 9.0	80.0 ± 8.5	85.5 ± 7.5
Number of provider(s) visited	One	92 (57.9%)		83.7 ± 6.1	84.8 ± 5.9	95.7 ± 3.3
	Two	47 (29.6%)		78.7 ± 9.4	83.0 ± 8.6	95.7 ± 4.6
	Three or more	10 (6.3%)		80.0 ± 20.0	90.0 ± 15.0	100.0 ± 0.0
Type of provider(s) visited	Private	128 (80.5%)		83.6 ± 5.1	85.9 ± 4.8	96.9 ± 2.4
	Public	2 (1.3%)		0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
	Both	19 (11.9%)		78.9 ± 15.0	84.2 ± 13.0	100.0 ± 0.0

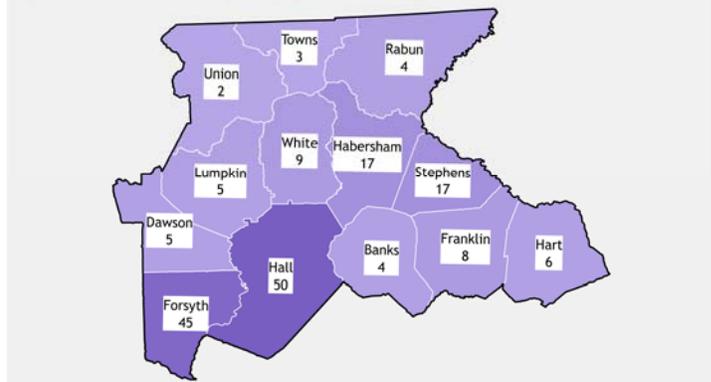
‡ Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 2-0

Figure 2-0-A: Location of District 2-0



Figure 2-0-B: Sampling per County, District 2-0, 2016



## Final Sample Determination

The original 2016 GIS sample for District 2-0 consisted of 175 children born in January of 2014 (Table 2-0-A). Of these, 21 children were determined to be ineligible for the study. Of those eligible, 1 child was unable to be located and was therefore excluded. The final sample size for District 2-0, which was used to calculate all rates, was 153. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 2-0, the UTD immunization rate by 24 months of age was 85.6%, which was higher than the 2015 rate (78.7%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 78.4%, higher than the 2015 rate (73.0%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 93.5%, higher than the 2015 rate (89.3%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 2-0-B and Figure 2-0-C). Rates that decreased in 2016 are shown as **red** in Table 2-0-B and Figure 2-0-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 2-0-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,972 vaccines doses administered to the District 2-0 cohort, 73 (2.5%) were administered by public health providers and 2,899 (97.5%) were administered by private providers.

Table 2-0-A: GIS Sampling Scheme, District 2-0, 2016

	2015	2016	State 2016
Original sample (n)	140	175	2742
Ineligible (n)	18	21	215
(Refused to participate) (n)	2	3	12
Eligible sample (n)	122	154	2527
Unable to locate <sup>†</sup> (n)	0	1	63
Final sample (n)	122	153	2464
Response rate (%)	100.0	99.4	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 2-0-B: Immunization Rates by Series and Vaccine Antigen, District 2-0, 2016

	2015 n = 122 (%)	2016 n = 153 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	73.0 ± 7.9	78.4 ± 5.6	76.5 ± 1.6
UTD immunization rate* by 24 months	78.7 ± 7.3	85.6 ± 4.8	82.1 ± 1.4
UTD immunization rate* by end of data collection†	89.3 ± 5.5	93.5 ± 3.3	91.0 ± 1.1
3 DTaP by 24 months	95.1 ± 3.9	96.7 ± 2.4	95.4 ± 0.8
4 DTaP by 24 months	82.8 ± 6.7	88.9 ± 4.3	84.3 ± 1.3
3 IPV by 24 months	94.3 ± 4.1	96.7 ± 2.4	94.5 ± 0.9
1 MMR by 24 months	86.9 ± 6.0	90.8 ± 3.9	93.1 ± 0.9
UTD Hib by 24 months	93.4 ± 4.4	94.1 ± 3.2	90.7 ± 1.1
3 Hep B by 24 months	93.4 ± 4.4	93.5 ± 3.3	95.0 ± 0.8
1 Varicella by 24 months	89.3 ± 5.5	90.8 ± 3.9	93.0 ± 1.0
UTD PCV by 24 months	89.3 ± 5.5	93.5 ± 3.3	91.4 ± 1.0
2 Hep A by 24 months	54.9 ± 8.9	62.7 ± 6.6	62.3 ± 1.8
2 Rotavirus by 24 months	85.2 ± 6.3	92.2 ± 3.6	<b>85.3 ± 1.3</b>
1+ Influenza by 24 months	63.9 ± 8.6	<b>56.9 ± 6.7</b>	58.8 ± 1.8
Hep B birth dose by 4 days	68.0 ± 8.3	74.5 ± 5.9	<b>83.6 ± 1.4</b>

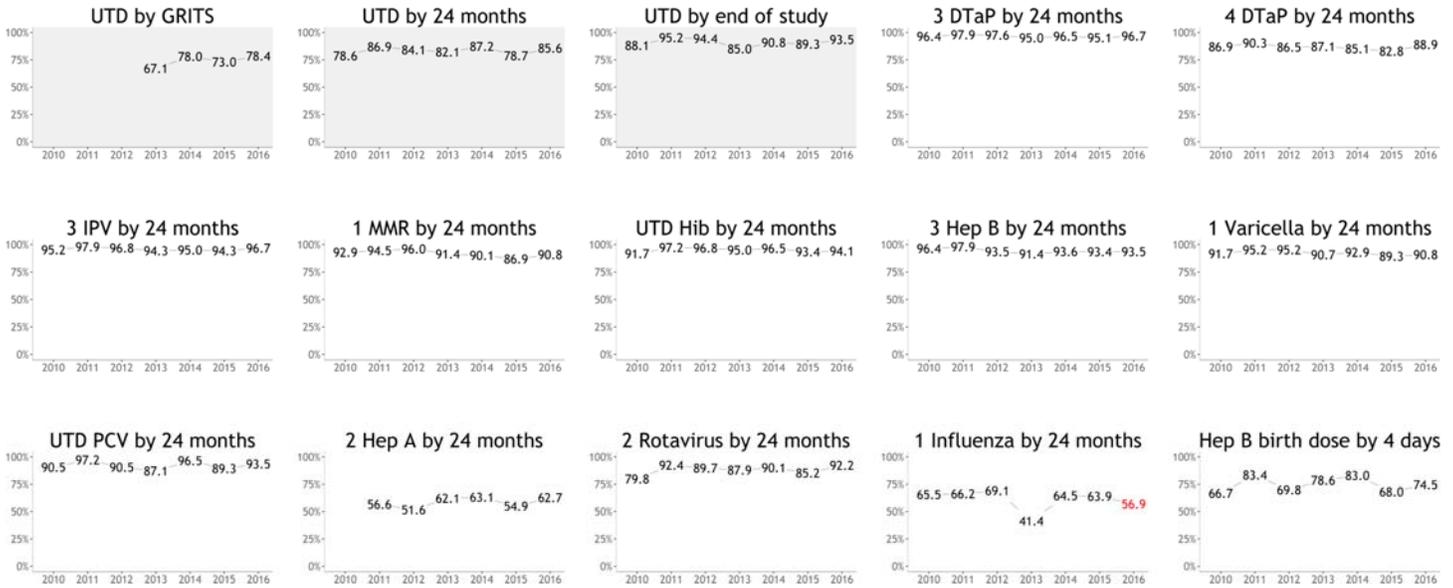
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 2-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 2-0, 2010-2016**



**Demographic Findings**

The demographic breakdown of the District 2-0 sample (and all District 2-0 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 2-0-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 2-0.

**Table 2-0-C: District 2-0 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		2-0 Sample † n = 153	All 2014 births † N = 7,417	GRITS alone n = 153 (%)	24 months n = 153 (%)	End of study n = 153 (%)
Mother's race*	White	137 (89.5%)	6435 (86.8%)	75.9 ± 6.1	83.9 ± 5.3	92.7 ± 3.7
	Black or African-American	5 (3.3%)	401 (5.4%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Asian	5 (3.3%)	351 (4.7%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	3 (2.0%)	112 (1.5%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	128 (83.7%)	5757 (77.6%)	76.6 ± 6.3	85.2 ± 5.3	92.2 ± 4.0
	Hispanic	25 (16.3%)	1620 (21.8%)	88.0 ± 11.0	88.0 ± 11.0	100.0 ± 0.0
Mother's age*	<25 years old	41 (26.8%)	2228 (30.0%)	80.5 ± 10.0	85.4 ± 9.3	90.2 ± 7.8
	25 - 35 years old	90 (58.8%)	4015 (54.1%)	75.6 ± 7.6	85.6 ± 6.2	94.4 ± 4.0
	35+ years old	22 (14.4%)	1174 (15.8%)	86.4 ± 12.0	86.4 ± 12.0	95.5 ± 7.4
Mother's education*	Some college or higher	88 (57.5%)	3864 (52.1%)	79.5 ± 7.2	85.2 ± 6.3	93.2 ± 4.5
	High School Graduate/GED	40 (26.1%)	2014 (27.2%)	75.0 ± 11.0	87.5 ± 8.8	92.5 ± 7.0
	9th - 11th grade	14 (9.2%)	881 (11.9%)	71.4 ± 20.0	78.6 ± 18.0	92.9 ± 12.0
	<9th grade	6 (3.9%)	447 (6.0%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	104 (68.0%)	4832 (65.1%)	77.9 ± 6.8	83.7 ± 6.1	92.3 ± 4.4
	Unmarried	48 (31.4%)	2536 (34.2%)	79.2 ± 9.8	89.6 ± 7.4	95.8 ± 4.8
Child's WIC status	WIC	87 (56.9%)		80.5 ± 7.1	85.1 ± 6.4	94.3 ± 4.2
	Non-WIC	66 (43.1%)		75.8 ± 8.8	86.4 ± 7.1	92.4 ± 5.5
Number of provider(s) visited	One	102 (66.7%)		89.2 ± 5.1	91.2 ± 4.7	97.1 ± 2.8
	Two	36 (23.5%)		61.1 ± 14.0	75.0 ± 12.0	88.9 ± 8.8
	Three or more	10 (6.5%)		70.0 ± 24.0	90.0 ± 16.0	100.0 ± 0.0
Type of provider(s) visited	Private	135 (88.2%)		83.7 ± 5.3	88.9 ± 4.5	96.3 ± 2.7
	Public	0 (0%)				
	Both	13 (8.5%)		53.8 ± 23.0	69.2 ± 21.0	84.6 ± 17.0

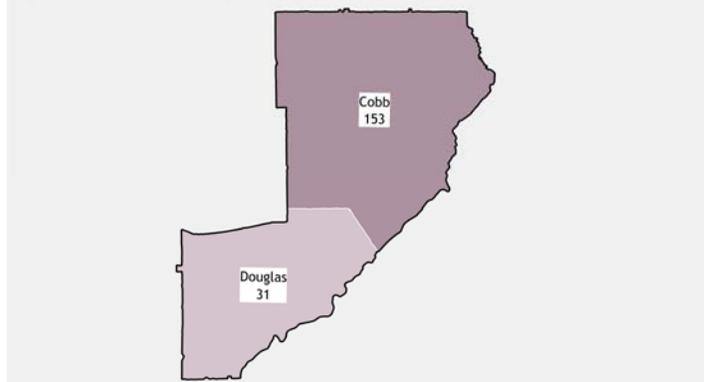
† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 3-1

Figure 3-1-A: Location of District 3-1



Figure 3-1-B: Sampling per County, District 3-1, 2016



## Final Sample Determination

The original 2016 GIS sample for District 3-1 consisted of 184 children born in January of 2014 (Table 3-1-A). Of these, 16 children were determined to be ineligible for the study. Of those eligible, 4 children were unable to be located and were therefore excluded. The final sample size for District 3-1, which was used to calculate all rates, was 164. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 3-1, the UTD immunization rate by 24 months of age was 85.4%, which was higher than the 2015 rate (81.7%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 78.7%, higher than the 2015 rate (78.5%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 95.1%, higher than the 2015 rate (90.3%), and the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 3-1-B and Figure 3-1-C). Rates that decreased in 2016 are shown as **red** in Table 3-1-B and Figure 3-1-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 3-1-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 3,297 vaccines doses administered to the District 3-1 cohort, 67 (2.0%) were administered by public health providers and 3,230 (98.0%) were administered by private providers.

Table 3-1-A: GIS Sampling Scheme, District 3-1, 2016

	2015	2016	State 2016
Original sample (n)	110	184	2742
Ineligible (n)	17	16	215
(Refused to participate) (n)	1	1	12
Eligible sample (n)	93	168	2527
Unable to locate <sup>†</sup> (n)	0	4	63
Final sample (n)	93	164	2464
Response rate (%)	100	97.6	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 3-1-B: Immunization Rates by Series and Vaccine Antigen, District 3-1, 2016

	2015 n = 93 (%)	2016 n = 164 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	78.5 ± 8.4	78.7 ± 5.7	76.5 ± 1.6
UTD immunization rate* by 24 months	81.7 ± 7.9	85.4 ± 4.9	82.1 ± 1.4
UTD immunization rate* by end of data collection†	90.3 ± 6.0	95.1 ± 3.0	<b>91.0 ± 1.1</b>
3 DTaP by 24 months	95.7 ± 4.1	97.0 ± 2.4	95.4 ± 0.8
4 DTaP by 24 months	81.7 ± 7.9	87.8 ± 4.6	84.3 ± 1.3
3 IPV by 24 months	94.6 ± 4.6	<b>94.5 ± 3.2</b>	94.5 ± 0.9
1 MMR by 24 months	96.8 ± 3.6	97.6 ± 2.1	<b>93.1 ± 0.9</b>
UTD Hib by 24 months	94.6 ± 4.6	95.1 ± 3.0	<b>90.7 ± 1.1</b>
3 Hep B by 24 months	96.8 ± 3.6	<b>93.9 ± 3.3</b>	95.0 ± 0.8
1 Varicella by 24 months	96.8 ± 3.6	<b>96.3 ± 2.6</b>	93.0 ± 1.0
UTD PCV by 24 months	95.7 ± 4.1	96.3 ± 2.6	<b>91.4 ± 1.0</b>
2 Hep A by 24 months	55.9 ± 10.0	71.3 ± 6.3	<b>62.3 ± 1.8</b>
2 Rotavirus by 24 months	87.1 ± 6.9	87.8 ± 4.6	85.3 ± 1.3
1+ Influenza by 24 months	54.8 ± 10.0	66.5 ± 6.6	58.8 ± 1.8
Hep B birth dose by 4 days	77.4 ± 8.5	<b>73.8 ± 6.1</b>	<b>83.6 ± 1.4</b>

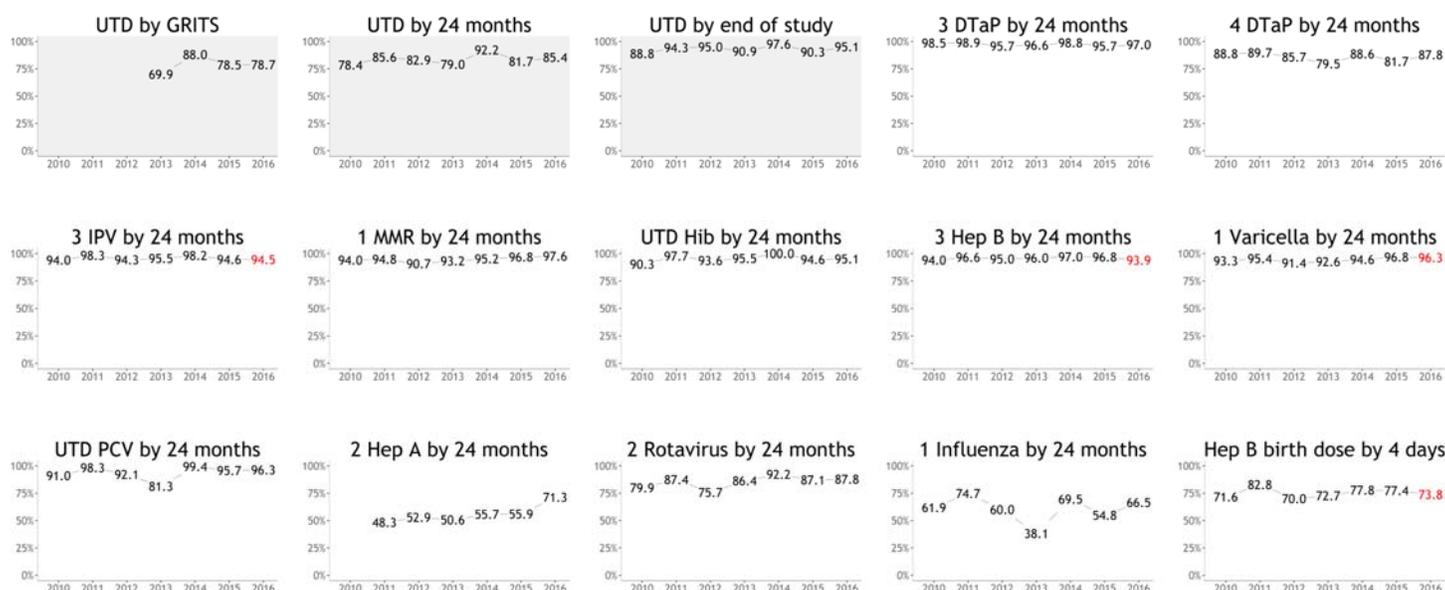
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 3-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-1, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 3-1 sample (and all District 3-1 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 3-1-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 3-1-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 3-1-C: District 3-1 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-1 Sample † n = 164	All 2014 births † N = 11,058	GRITS alone n = 164 (%)	24 months n = 164 (%)	End of study n = 164 (%)
Mother's race*	White	99 (60.4%)	6418 (58.0%)	80.8 ± 7.1	<b>89.9 ± 5.4</b>	97.0 ± 3.1
	Black or African-American	44 (26.8%)	3492 (31.6%)	65.9 ± 13.0	<b>70.5 ± 12.0</b>	88.6 ± 8.5
	Asian	15 (9.1%)	599 (5.4%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	3 (1.8%)	251 (2.3%)	66.7 ± 49.0	66.7 ± 49.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	137 (83.5%)	9068 (82.0%)	80.3 ± 6.1	85.4 ± 5.4	94.9 ± 3.4
	Hispanic	27 (16.5%)	1887 (17.1%)	70.4 ± 16.0	85.2 ± 12.0	96.3 ± 6.5
Mother's age*	<25 years old	22 (13.4%)	2378 (21.5%)	72.7 ± 17.0	81.8 ± 15.0	95.5 ± 7.9
	25 - 35 years old	101 (61.6%)	6321 (57.2%)	75.2 ± 7.7	<b>82.2 ± 6.8</b>	94.1 ± 4.2
	35+ years old	41 (25.0%)	2359 (21.3%)	90.2 ± 8.3	<b>95.1 ± 6.0</b>	97.6 ± 4.3
Mother's education*	Some college or higher	118 (72%)	7145 (64.6%)	80.5 ± 6.5	87.3 ± 5.5	96.6 ± 3.0
	High School Graduate/GED	30 (18.3%)	2204 (19.9%)	70.0 ± 15.0	76.7 ± 14.0	86.7 ± 11.0
	9th - 11th grade	5 (3.0%)	821 (7.4%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	<9th grade	3 (1.8%)	414 (3.7%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	114 (69.5%)	7016 (63.4%)	86.0 ± 5.8	<b>91.2 ± 4.7</b>	95.6 ± 3.4
	Unmarried	47 (28.7%)	4029 (36.4%)	66.0 ± 12.0	<b>72.3 ± 12.0</b>	93.6 ± 6.4
Child's WIC status	WIC	57 (34.8%)		68.4 ± 11.0	<b>73.7 ± 10.0</b>	93.0 ± 6.0
	Non-WIC	107 (65.2%)		84.1 ± 6.3	<b>91.6 ± 4.8</b>	96.3 ± 3.3
Number of provider(s) visited	One	88 (53.7%)		76.1 ± 8.1	81.8 ± 7.3	93.2 ± 4.8
	Two	60 (36.6%)		80.0 ± 9.2	88.3 ± 7.4	96.7 ± 4.1
	Three or more	15 (9.1%)		86.7 ± 16.0	93.3 ± 11.0	100.0 ± 0.0
Type of provider(s) visited	Private	151 (92.1%)		78.8 ± 5.9	85.4 ± 5.1	94.7 ± 3.2
	Public	1 (0.6%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Both	11 (6.7%)		72.7 ± 24.0	81.8 ± 21.0	100.0 ± 0.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 3-2

Figure 3-2-A: Location of District 3-2



Figure 3-2-B: Sampling per County, District 3-2, 2016



## Final Sample Determination

The original 2016 GIS sample for District 3-2 consisted of 177 children born in January of 2014 (Table 3-2-A). Of these, 15 children were determined to be ineligible for the study. Of those eligible, 3 children were unable to be located and were therefore excluded. The final sample size for District 3-2, which was used to calculate all rates, was 159. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 3-2, the UTD immunization rate by 24 months of age was 86.2%, which was higher than the 2015 rate (84.3%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 81.1%, lower than the 2015 rate (83.3%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 92.5%, higher than the 2015 rate (90.7%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 3-2-B and Figure 3-2-C). Rates that decreased in 2016 are shown as **red** in Table 3-2-B and Figure 3-2-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 3-2-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 3,147 vaccines doses administered to the District 3-2 cohort, 46 (1.5%) were administered by public health providers and 3,101 (98.5%) were administered by private providers.

Table 3-2-A: GIS Sampling Scheme, District 3-2, 2016

	2015	2016	State 2016
Original sample (n)	120	177	2742
Ineligible (n)	7	15	215
(Refused to participate) (n)	1	1	12
Eligible sample (n)	113	162	2527
Unable to locate <sup>†</sup> (n)	5	3	63
Final sample (n)	108	159	2464
Response rate (%)	95.6	98.1	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 3-2-B: Immunization Rates by Series and Vaccine Antigen, District 3-2, 2016

	2015 n = 108 (%)	2016 n = 159 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	83.3 ± 7.1	<b>81.1 ± 5.6</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	84.3 ± 6.9	86.2 ± 5.0	82.1 ± 1.4
UTD immunization rate* by end of data collection†	90.7 ± 5.5	92.5 ± 3.8	91.0 ± 1.1
3 DTaP by 24 months	94.4 ± 4.3	95.6 ± 2.9	95.4 ± 0.8
4 DTaP by 24 months	86.1 ± 6.6	86.2 ± 5.0	84.3 ± 1.3
3 IPV by 24 months	94.4 ± 4.3	95.0 ± 3.1	94.5 ± 0.9
1 MMR by 24 months	92.6 ± 5.0	95.6 ± 2.9	93.1 ± 0.9
UTD Hib by 24 months	92.6 ± 5.0	<b>92.5 ± 3.8</b>	90.7 ± 1.1
3 Hep B by 24 months	95.4 ± 4.0	<b>95.0 ± 3.1</b>	95.0 ± 0.8
1 Varicella by 24 months	90.7 ± 5.5	95.6 ± 2.9	93.0 ± 1.0
UTD PCV by 24 months	90.7 ± 5.5	93.7 ± 3.5	91.4 ± 1.0
2 Hep A by 24 months	60.2 ± 9.3	67.9 ± 6.7	62.3 ± 1.8
2 Rotavirus by 24 months	80.6 ± 7.5	85.5 ± 5.0	85.3 ± 1.3
1+ Influenza by 24 months	59.3 ± 9.3	69.2 ± 6.6	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	75.9 ± 8.1	83.0 ± 5.4	83.6 ± 1.4

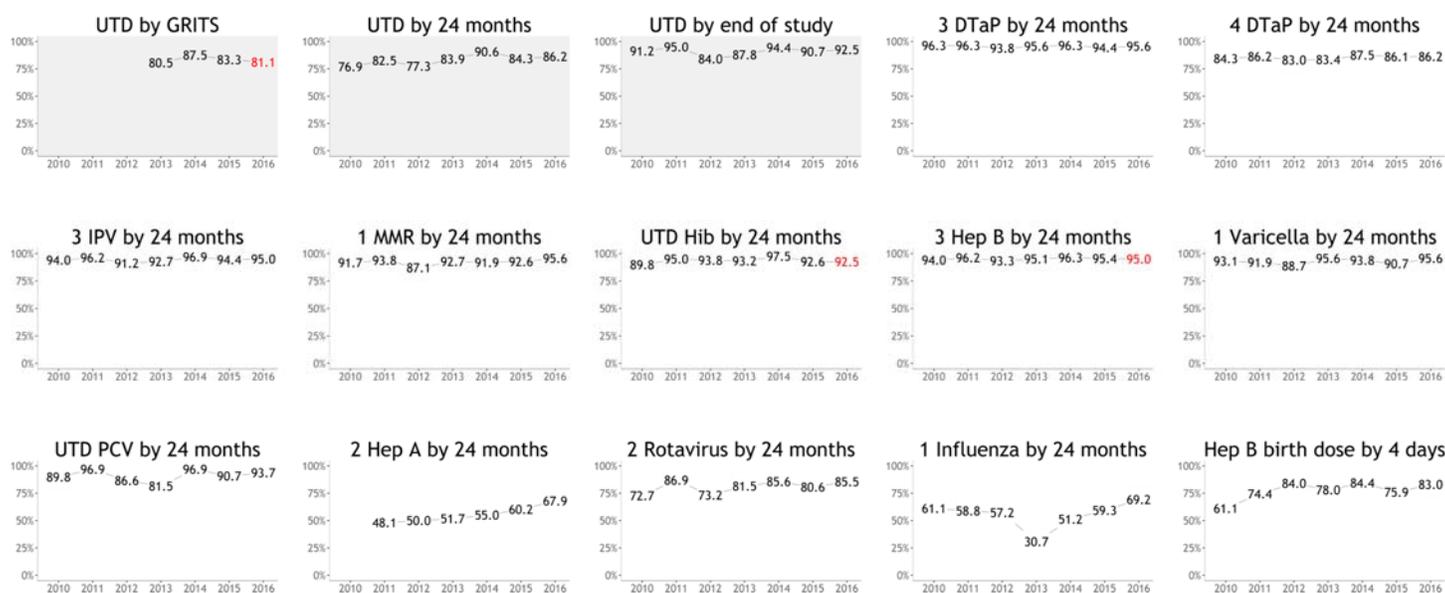
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 3-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-2, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 3-2 sample (and all District 3-2 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 3-2-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 3-2-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 3-2-C: District 3-2 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-2 Sample † n = 159	All 2014 births † N = 12,423	GRITS alone n = 159 (%)	24 months n = 159 (%)	End of study n = 159 (%)
Mother's race*	White	68 (42.8%)	4609 (37.1%)	91.2 ± 6.2	<b>98.5 ± 2.6</b>	100.0 ± 0.0
	Black or African-American	69 (43.4%)	6182 (49.8%)	72.5 ± 9.7	<b>73.9 ± 9.6</b>	85.5 ± 7.7
	Asian	11 (6.9%)	930 (7.5%)	90.9 ± 16.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	4 (2.5%)	320 (2.6%)	50.0 ± 45.0	50.0 ± 45.0	75.0 ± 39.0
Mother's ethnicity*	Non-Hispanic	135 (84.9%)	10872 (87.5%)	80.7 ± 6.1	85.2 ± 5.5	91.1 ± 4.4
	Hispanic	24 (15.1%)	1322 (10.6%)	83.3 ± 14.0	91.7 ± 10.0	100.0 ± 0.0
Mother's age*	<25 years old	40 (25.2%)	2972 (23.9%)	67.5 ± 13.0	<b>70.0 ± 13.0</b>	90.0 ± 8.6
	25 - 35 years old	86 (54.1%)	6818 (54.9%)	84.9 ± 7.0	<b>90.7 ± 5.7</b>	93.0 ± 5.0
	35+ years old	33 (20.8%)	2633 (21.2%)	87.9 ± 10.0	<b>93.9 ± 7.5</b>	93.9 ± 7.5
Mother's education*	Some college or higher	93 (58.5%)	7698 (62.0%)	88.2 ± 6.1	<b>93.5 ± 4.6</b>	94.6 ± 4.2
	High School Graduate/GED	29 (18.2%)	2636 (21.2%)	72.4 ± 15.0	75.9 ± 14.0	93.1 ± 8.5
	9th - 11th grade	25 (15.7%)	1296 (10.4%)	72.0 ± 16.0	<b>72.0 ± 16.0</b>	84.0 ± 13.0
	<9th grade	2 (1.3%)	308 (2.5%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	91 (57.2%)	6552 (52.7%)	87.9 ± 6.2	<b>94.5 ± 4.3</b>	94.5 ± 4.3
	Unmarried	66 (41.5%)	5840 (47.0%)	72.7 ± 9.9	<b>75.8 ± 9.5</b>	89.4 ± 6.9
Child's WIC status	WIC	57 (35.8%)		71.9 ± 11.0	<b>75.4 ± 10.0</b>	86.0 ± 8.3
	Non-WIC	102 (64.2%)		86.3 ± 6.2	<b>92.2 ± 4.8</b>	96.1 ± 3.5
Number of provider(s) visited	One	106 (66.7%)		86.8 ± 5.9	89.6 ± 5.4	93.4 ± 4.4
	Two	41 (25.8%)		75.6 ± 12.0	85.4 ± 10.0	95.1 ± 6.1
	Three or more	9 (5.7%)		55.6 ± 30.0	66.7 ± 28.0	88.9 ± 19.0
Type of provider(s) visited	Private	148 (93.1%)		84.5 ± 5.4	<b>89.9 ± 4.5</b>	95.9 ± 2.9
	Public	1 (0.6%)		0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
	Both	7 (4.4%)		42.9 ± 34.0	<b>42.9 ± 34.0</b>	57.1 ± 34.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

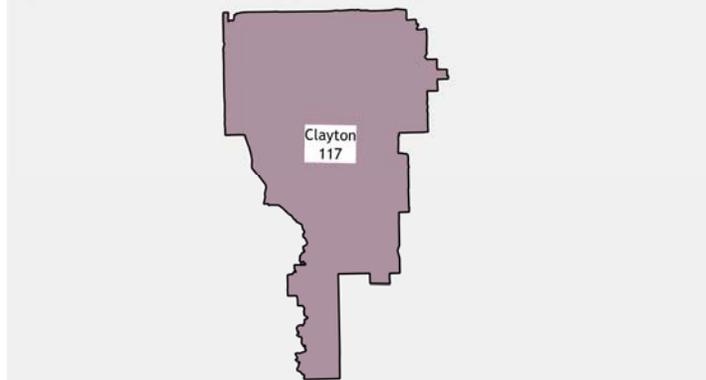
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 3-3

Figure 3-3-A: Location of District 3-3



Figure 3-3-B: Sampling per County, District 3-3, 2016



## Final Sample Determination

The original 2016 GIS sample for District 3-3 consisted of 117 children born in January of 2014 (Table 3-3-A). Of these, 6 children were determined to be ineligible for the study. Of those eligible, 15 children were unable to be located and were therefore excluded. The final sample size for District 3-3, which was used to calculate all rates, was 96. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a smaller sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 3-3, the UTD immunization rate by 24 months of age was 78.1%, which was lower than the 2015 rate (87.2%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 68.8%, lower than the 2015 rate (83.2%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 92.7%, lower than the 2015 rate (96.8%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 3-3-B and Figure 3-3-C). Rates that decreased in 2016 are shown as **red** in Table 3-3-B and Figure 3-3-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 3-3-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 1,860 vaccines doses administered to the District 3-3 cohort, 75 (4%) were administered by public health providers and 1,785 (96%) were administered by private providers.

Table 3-3-A: GIS Sampling Scheme, District 3-3, 2016

	2015	2016	State 2016
Original sample (n)	146	117	2742
Ineligible (n)	12	6	215
(Refused to participate) (n)	2	2	12
Eligible sample (n)	134	111	2527
Unable to locate <sup>†</sup> (n)	9	15	63
Final sample (n)	125	96	2464
Response rate (%)	93.3	86.5	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 3-3-B: Immunization Rates by Series and Vaccine Antigen, District 3-3, 2016

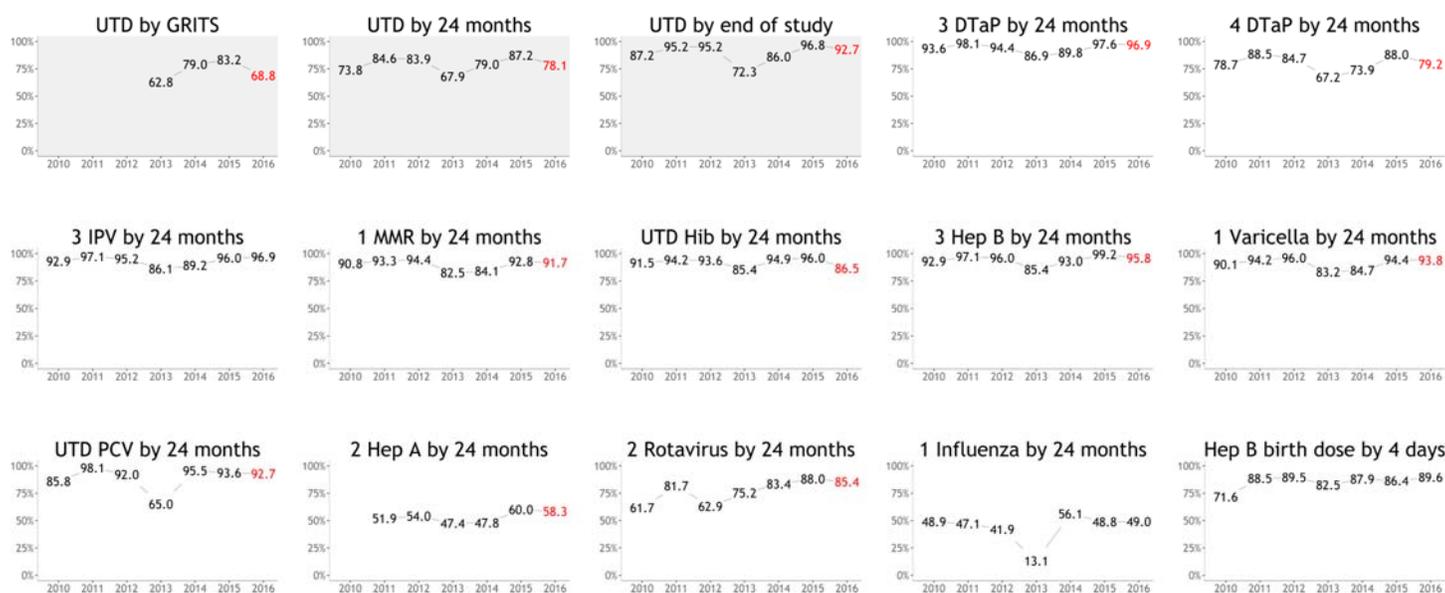
	2015 <i>n</i> = 125 (%)	2016 <i>n</i> = 96 (%)	State <i>n</i> = 2,464 (%)
UTD immunization rate* based on GRITS alone	83.2 ± 6.6	<b>68.8 ± 7.9</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	87.2 ± 5.9	<b>78.1 ± 7.0</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection†	96.8 ± 3.1	<b>92.7 ± 4.4</b>	91.0 ± 1.1
3 DTaP by 24 months	97.6 ± 2.7	<b>96.9 ± 3.0</b>	95.4 ± 0.8
4 DTaP by 24 months	88.0 ± 5.7	<b>79.2 ± 6.9</b>	84.3 ± 1.3
3 IPV by 24 months	96.0 ± 3.4	96.9 ± 3.0	94.5 ± 0.9
1 MMR by 24 months	92.8 ± 4.5	<b>91.7 ± 4.7</b>	93.1 ± 0.9
UTD Hib by 24 months	<b>96.0 ± 3.4</b>	<b>86.5 ± 5.8</b>	90.7 ± 1.1
3 Hep B by 24 months	99.2 ± 1.6	<b>95.8 ± 3.4</b>	95.0 ± 0.8
1 Varicella by 24 months	94.4 ± 4.0	<b>93.8 ± 4.1</b>	93.0 ± 1.0
UTD PCV by 24 months	93.6 ± 4.3	<b>92.7 ± 4.4</b>	91.4 ± 1.0
2 Hep A by 24 months	60.0 ± 8.6	<b>58.3 ± 8.4</b>	62.3 ± 1.8
2 Rotavirus by 24 months	88.0 ± 5.7	<b>85.4 ± 6.0</b>	85.3 ± 1.3
1+ Influenza by 24 months	48.8 ± 8.8	49.0 ± 8.5	58.8 ± 1.8
Hep B birth dose by 4 days	86.4 ± 6.0	89.6 ± 5.2	83.6 ± 1.4

<sup>†</sup> Includes children who become UTD during the data collection period  
\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 3-3-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-3, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 3-3 sample (and all District 3-3 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 3-3-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 3-3-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 3-3-C: District 3-3 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-3 Sample † n = 96	All 2014 births † N = 4,165	GRITS alone n = 96 (%)	24 months n = 96 (%)	End of study n = 96 (%)
Mother's race*	White	24 (25.0%)	922 (22.1%)	87.5 ± 11.0	87.5 ± 11.0	91.7 ± 9.4
	Black or African-American	60 (62.5%)	2797 (67.2%)	65.0 ± 10.0	75.0 ± 9.3	93.3 ± 5.4
	Asian	9 (9.4%)	143 (3.4%)	55.6 ± 28.0	77.8 ± 23.0	100.0 ± 0.0
	Multiracial	3 (3.1%)	176 (4.2%)	33.3 ± 45.0	66.7 ± 45.0	66.7 ± 45.0
Mother's ethnicity*	Non-Hispanic	71 (74.0%)	3349 (80.4%)	64.8 ± 9.4	77.5 ± 8.3	94.4 ± 4.6
	Hispanic	25 (26.0%)	771 (18.5%)	80.0 ± 13.0	80.0 ± 13.0	88.0 ± 11.0
Mother's age*	<25 years old	37 (38.5%)	1566 (37.6%)	64.9 ± 13.0	73.0 ± 12.0	86.5 ± 9.4
	25 - 35 years old	45 (46.9%)	2062 (49.5%)	66.7 ± 12.0	77.8 ± 10.0	97.8 ± 3.7
	35+ years old	14 (14.6%)	537 (12.9%)	85.7 ± 16.0	92.9 ± 11.0	92.9 ± 11.0
Mother's education*	Some college or higher	35 (36.5%)	1651 (39.6%)	68.6 ± 13.0	82.9 ± 11.0	94.3 ± 6.5
	High School Graduate/GED	30 (31.2%)	1444 (34.7%)	76.7 ± 13.0	83.3 ± 11.0	96.7 ± 5.5
	9th - 11th grade	17 (17.7%)	666 (16.0%)	47.1 ± 20.0	58.8 ± 20.0	82.4 ± 15.0
	<9th grade	9 (9.4%)	252 (6.1%)	88.9 ± 17.0	88.9 ± 17.0	100.0 ± 0.0
Marital status*	Married	28 (29.2%)	1357 (32.6%)	75.0 ± 14.0	82.1 ± 12.0	89.3 ± 9.7
	Unmarried	68 (70.8%)	2789 (67.0%)	66.2 ± 9.6	76.5 ± 8.6	94.1 ± 4.8
Child's WIC status	WIC	52 (54.2%)		65.4 ± 11.0	80.8 ± 9.1	96.2 ± 4.4
	Non-WIC	44 (45.8%)		72.7 ± 11.0	75.0 ± 11.0	88.6 ± 8.0
Number of provider(s) visited	One	53 (55.2%)		79.2 ± 9.3	<b>86.8 ± 7.7</b>	96.2 ± 4.4
	Two	35 (36.5%)		51.4 ± 14.0	<b>62.9 ± 14.0</b>	88.6 ± 9.0
	Three or more	8 (8.3%)		75.0 ± 26.0	87.5 ± 19.0	87.5 ± 19.0
Type of provider(s) visited	Private	81 (84.4%)		75.3 ± 8.0	<b>82.7 ± 7.0</b>	95.1 ± 4.0
	Public					
	Both	15 (15.6%)		33.3 ± 20.0	<b>53.3 ± 21.0</b>	80.0 ± 17.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 3-4

Figure 3-4-A: Location of District 3-4



Figure 3-4-B: Sampling per County, District 3-4, 2016



## Final Sample Determination

The original 2016 GIS sample for District 3-4 consisted of 190 children born in January of 2014 (Table 3-4-A). Of these, 15 children were determined to be ineligible for the study. Of those eligible, 3 children were unable to be located and were therefore excluded. The final sample size for District 3-4, which was used to calculate all rates, was 172. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 3-4, the UTD immunization rate by 24 months of age was 82.6%, which was lower than the 2015 rate (83.2%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 76.2%, lower than the 2015 rate (79.4%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 91.9%, higher than the 2015 rate (90.3%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 3-4-B and Figure 3-4-C). Rates that decreased in 2016 are shown as red in Table 3-4-B and Figure 3-4-C. All of the confidence intervals for these rates overlapped, indicating that significant differences between the rates were unlikely.

## Immunization Administration

Of the 3,261 vaccines doses administered to the District 3-4 cohort, 85 (2.6%) were administered by public health providers and 3,176 (97.4%) were administered by private providers.

Table 3-4-A: GIS Sampling Scheme, District 3-4, 2016

	2015	2016	State 2016
Original sample (n)	173	190	2742
Ineligible (n)	13	15	215
(Refused to participate) (n)	0	1	12
Eligible sample (n)	160	175	2527
Unable to locate <sup>†</sup> (n)	5	3	63
Final sample (n)	155	172	2464
Response rate (%)	96.9	98.3	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 3-4-B: Immunization Rates by Series and Vaccine Antigen, District 3-4, 2016

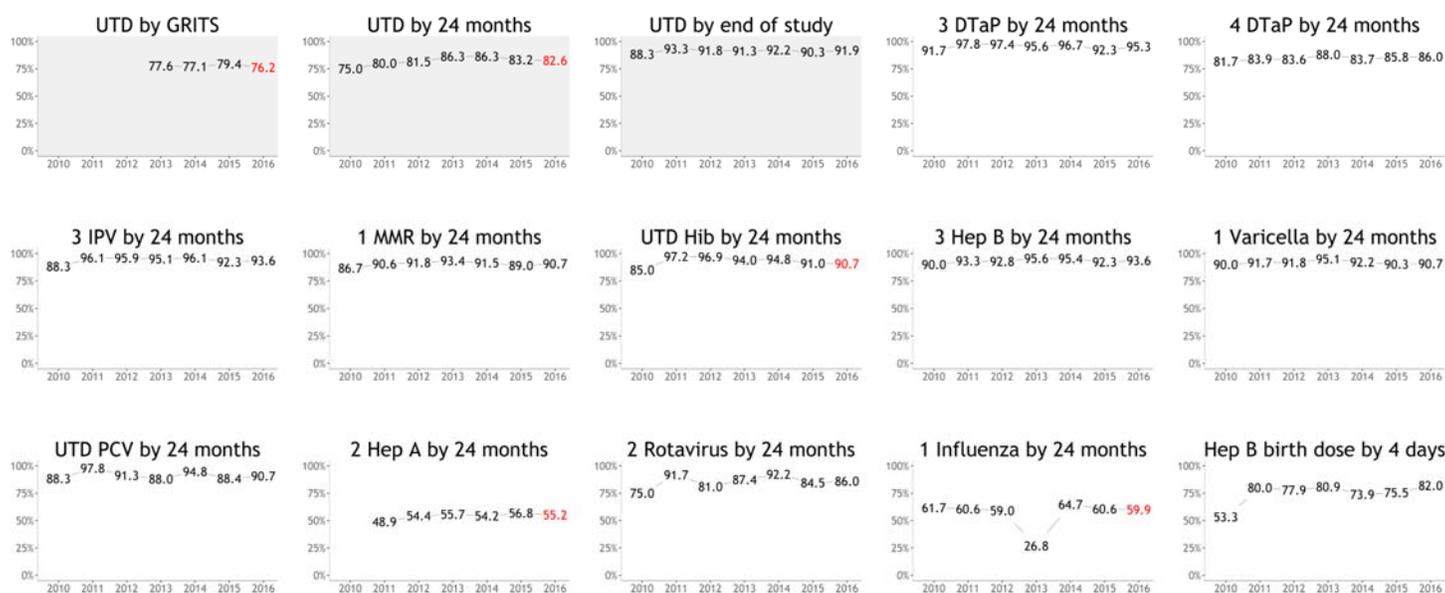
	2015 n = 155 (%)	2016 n = 172 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	79.4 ± 6.4	<b>76.2 ± 5.9</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	83.2 ± 5.9	<b>82.6 ± 5.2</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection†	90.3 ± 4.7	91.9 ± 3.8	91.0 ± 1.1
3 DTaP by 24 months	92.3 ± 4.2	95.3 ± 2.9	95.4 ± 0.8
4 DTaP by 24 months	85.8 ± 5.5	86.0 ± 4.8	84.3 ± 1.3
3 IPV by 24 months	92.3 ± 4.2	93.6 ± 3.4	94.5 ± 0.9
1 MMR by 24 months	89.0 ± 4.9	90.7 ± 4.0	93.1 ± 0.9
UTD Hib by 24 months	91.0 ± 4.5	<b>90.7 ± 4.0</b>	90.7 ± 1.1
3 Hep B by 24 months	92.3 ± 4.2	93.6 ± 3.4	95.0 ± 0.8
1 Varicella by 24 months	90.3 ± 4.7	90.7 ± 4.0	93.0 ± 1.0
UTD PCV by 24 months	88.4 ± 5.1	90.7 ± 4.0	91.4 ± 1.0
2 Hep A by 24 months	56.8 ± 7.8	<b>55.2 ± 6.9</b>	62.3 ± 1.8
2 Rotavirus by 24 months	84.5 ± 5.7	86.0 ± 4.8	85.3 ± 1.3
1+ Influenza by 24 months	60.6 ± 7.7	<b>59.9 ± 6.8</b>	58.8 ± 1.8
Hep B birth dose by 4 days	75.5 ± 6.8	82.0 ± 5.3	83.6 ± 1.4

<sup>†</sup> Includes children who become UTD during the data collection period  
\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 3-4-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-4, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 3-4 sample (and all District 3-4 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 3-4-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 3-4.

**Table 3-4-C: District 3-4 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-4 Sample † n = 172	All 2014 births † N = 13,681	GRITS alone n = 172 (%)	24 months n = 172 (%)	End of study n = 172 (%)
Mother's race*	White	82 (47.7%)	7242 (52.9%)	75.6 ± 8.6	80.5 ± 7.9	91.5 ± 5.6
	Black or African-American	62 (36.0%)	4420 (32.3%)	72.6 ± 10.0	82.3 ± 8.8	91.9 ± 6.3
	Asian	12 (7.0%)	1198 (8.8%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	5 (2.9%)	399 (2.9%)	80.0 ± 32.0	80.0 ± 32.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	139 (80.8%)	10037 (73.4%)	77.0 ± 6.5	83.5 ± 5.7	90.6 ± 4.5
	Hispanic	33 (19.2%)	3377 (24.7%)	72.7 ± 14.0	78.8 ± 13.0	97.0 ± 5.4
Mother's age*	<25 years old	45 (26.2%)	3337 (24.4%)	60.0 ± 13.0	68.9 ± 13.0	88.9 ± 8.5
	25 - 35 years old	99 (57.6%)	7654 (55.9%)	80.8 ± 7.2	85.9 ± 6.4	91.9 ± 5.0
	35+ years old	28 (16.3%)	2690 (19.7%)	85.7 ± 12.0	92.9 ± 8.8	96.4 ± 6.4
Mother's education*	Some college or higher	96 (55.8%)	7703 (56.3%)	81.2 ± 7.2	84.4 ± 6.7	90.6 ± 5.4
	High School Graduate/GED	50 (29.1%)	3468 (25.3%)	74.0 ± 11.0	82.0 ± 9.9	94.0 ± 6.1
	9th - 11th grade	15 (8.7%)	1066 (7.8%)	60.0 ± 23.0	73.3 ± 21.0	100.0 ± 0.0
	<9th grade	4 (2.3%)	663 (4.8%)	75.0 ± 39.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	102 (59.3%)	8237 (60.2%)	84.3 ± 6.5	86.3 ± 6.2	91.2 ± 5.1
	Unmarried	68 (39.5%)	5413 (39.6%)	64.7 ± 11.0	77.9 ± 9.1	94.1 ± 5.2
Child's WIC status	WIC	95 (55.2%)		72.6 ± 8.3	77.9 ± 7.7	90.5 ± 5.5
	Non-WIC	77 (44.8%)		80.5 ± 8.2	88.3 ± 6.6	93.5 ± 5.1
Number of provider(s) visited	One	101 (58.7%)		81.2 ± 7.1	88.1 ± 5.8	95.0 ± 3.9
	Two	53 (30.8%)		81.1 ± 9.8	84.9 ± 8.9	96.2 ± 4.7
	Three or more	13 (7.6%)		46.2 ± 25.0	61.5 ± 24.0	84.6 ± 18.0
Type of provider(s) visited	Private	151 (87.8%)		80.8 ± 5.8	87.4 ± 4.9	94.7 ± 3.3
	Public					
	Both	16 (9.3%)		56.2 ± 23.0	62.5 ± 22.0	93.8 ± 11.0

† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 3-5

Figure 3-5-A: Location of District 3-5



Figure 3-5-B: Sampling per County, District 3-5, 2016



## Final Sample Determination

The original 2016 GIS sample for District 3-5 consisted of 237 children born in January of 2014 (Table 3-5-A). Of these, 12 children were determined to be ineligible for the study. Of those eligible, 5 children were unable to be located and were therefore excluded. The final sample size for District 3-5, which was used to calculate all rates, was 220. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 3-5, the UTD immunization rate by 24 months of age was 77.3%, which was higher than the 2015 rate (73.8%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 69.5%, lower than the 2015 rate (73.1%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 89.1%, higher than the 2015 rate (80.0%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 3-5-B and Figure 3-5-C). Rates that decreased in 2016 are shown as red in Table 3-5-B and Figure 3-5-C. All of the confidence intervals for these rates overlapped, indicating that significant differences between the rates were unlikely.

## Immunization Administration

Of the 4,351 vaccines doses administered to the District 3-5 cohort, 171 (3.9%) were administered by public health providers and 4,180 (96.1%) were administered by private providers.

Table 3-5-A: GIS Sampling Scheme, District 3-5, 2016

	2015	2016	State 2016
Original sample (n)	135	237	2742
Ineligible (n)	0	12	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	135	225	2527
Unable to locate <sup>†</sup> (n)	5	5	63
Final sample (n)	130	220	2464
Response rate (%)	96.3	97.8	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 3-5-B: Immunization Rates by Series and Vaccine Antigen, District 3-5, 2016

	2015 n = 130 (%)	2016 n = 220 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	73.1 ± 7.7	<b>69.5 ± 5.3</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	73.8 ± 7.6	77.3 ± 4.8	82.1 ± 1.4
UTD immunization rate* by end of data collection†	80.0 ± 6.9	89.1 ± 3.6	91.0 ± 1.1
3 DTaP by 24 months	90.8 ± 5.0	96.4 ± 2.2	95.4 ± 0.8
4 DTaP by 24 months	75.4 ± 7.4	81.8 ± 4.5	84.3 ± 1.3
3 IPV by 24 months	89.2 ± 5.3	95.0 ± 2.5	94.5 ± 0.9
1 MMR by 24 months	85.4 ± 6.1	91.8 ± 3.2	93.1 ± 0.9
UTD Hib by 24 months	87.7 ± 5.7	88.6 ± 3.7	90.7 ± 1.1
3 Hep B by 24 months	93.1 ± 4.4	96.4 ± 2.2	95.0 ± 0.8
1 Varicella by 24 months	86.9 ± 5.8	91.4 ± 3.2	93.0 ± 1.0
UTD PCV by 24 months	83.8 ± 6.4	90.5 ± 3.4	91.4 ± 1.0
2 Hep A by 24 months	55.4 ± 8.6	60.9 ± 5.6	62.3 ± 1.8
2 Rotavirus by 24 months	83.1 ± 6.5	<b>82.7 ± 4.4</b>	85.3 ± 1.3
1+ Influenza by 24 months	68.5 ± 8.0	<b>62.7 ± 5.6</b>	58.8 ± 1.8
Hep B birth dose by 4 days	81.5 ± 6.7	85.9 ± 4.0	83.6 ± 1.4

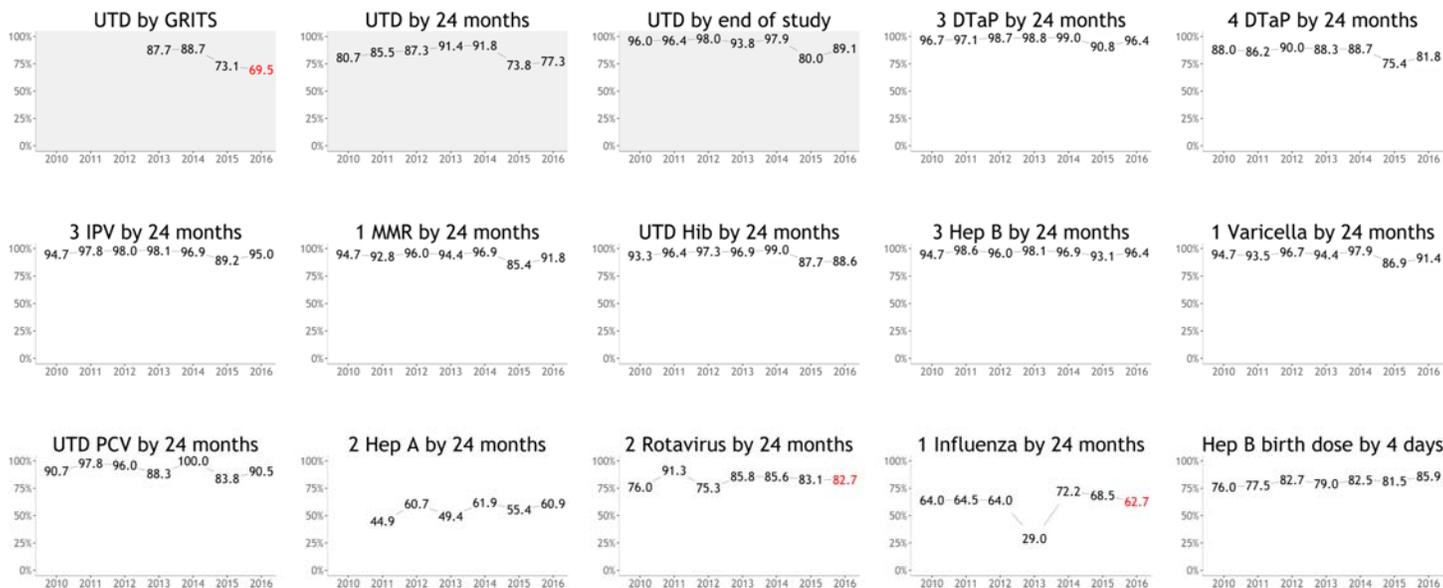
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 3-5-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-5, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 3-5 sample (and all District 3-5 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 3-5-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 3-5-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 3-5-C: District 3-5 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-5 Sample † n = 220	All 2014 births † N = 10,727	GRITS alone n = 220 (%)	24 months n = 220 (%)	End of study n = 220 (%)
Mother's race*	White	75 (34.1%)	3799 (35.4%)	77.3 ± 8.3	84.0 ± 7.3	90.7 ± 5.8
	Black or African-American	111 (50.5%)	5240 (48.8%)	64.0 ± 7.8	69.4 ± 7.5	84.7 ± 5.9
	Asian	9 (4.1%)	828 (7.7%)	77.8 ± 24.0	88.9 ± 18.0	100.0 ± 0.0
	Multiracial	13 (5.9%)	348 (3.2%)	69.2 ± 22.0	84.6 ± 17.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	175 (79.5%)	9011 (84.0%)	66.3 ± 6.1	75.4 ± 5.6	87.4 ± 4.3
	Hispanic	45 (20.5%)	1556 (14.5%)	82.2 ± 9.8	84.4 ± 9.3	95.6 ± 5.3
Mother's age*	<25 years old	65 (29.5%)	2687 (25.0%)	60.0 ± 10.0	69.2 ± 9.8	83.1 ± 8.0
	25 - 35 years old	106 (48.2%)	5902 (55.0%)	74.5 ± 7.3	79.2 ± 6.8	90.6 ± 4.9
	35+ years old	49 (22.3%)	2138 (19.9%)	71.4 ± 11.0	83.7 ± 9.1	93.9 ± 5.9
Mother's education*	Some college or higher	103 (46.8%)	5911 (55.1%)	75.7 ± 7.2	<b>83.5 ± 6.3</b>	90.3 ± 5.0
	High School Graduate/GED	66 (30.0%)	2820 (26.3%)	57.6 ± 10.0	<b>65.2 ± 10.0</b>	81.8 ± 8.1
	9th - 11th grade	26 (11.8%)	863 (8.0%)	73.1 ± 15.0	76.9 ± 14.0	92.3 ± 9.0
	<9th grade	13 (5.9%)	725 (6.8%)	84.6 ± 17.0	84.6 ± 17.0	100.0 ± 0.0
Marital status*	Married	104 (47.3%)	5629 (52.5%)	81.7 ± 6.5	<b>88.5 ± 5.4</b>	93.3 ± 4.2
	Unmarried	115 (52.3%)	5071 (47.3%)	59.1 ± 7.9	<b>67.0 ± 7.5</b>	85.2 ± 5.7
Child's WIC status	WIC	121 (55.0%)		62.8 ± 7.5	<b>69.4 ± 7.2</b>	87.6 ± 5.1
	Non-WIC	99 (45.0%)		77.8 ± 7.2	<b>86.9 ± 5.8</b>	90.9 ± 5.0
Number of provider(s) visited	One	129 (58.6%)		77.5 ± 6.3	82.2 ± 5.8	90.7 ± 4.4
	Two	68 (30.9%)		58.8 ± 10.0	70.6 ± 9.5	86.8 ± 7.1
	Three or more	19 (8.6%)		57.9 ± 19.0	68.4 ± 18.0	89.5 ± 12.0
Type of provider(s) visited	Private	189 (85.9%)		73.0 ± 5.5	<b>80.4 ± 5.0</b>	91.0 ± 3.6
	Public	2 (0.9%)		50.0 ± 61.0	50.0 ± 61.0	50.0 ± 61.0
	Both	25 (11.4%)		48.0 ± 17.0	<b>56.0 ± 17.0</b>	80.0 ± 14.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

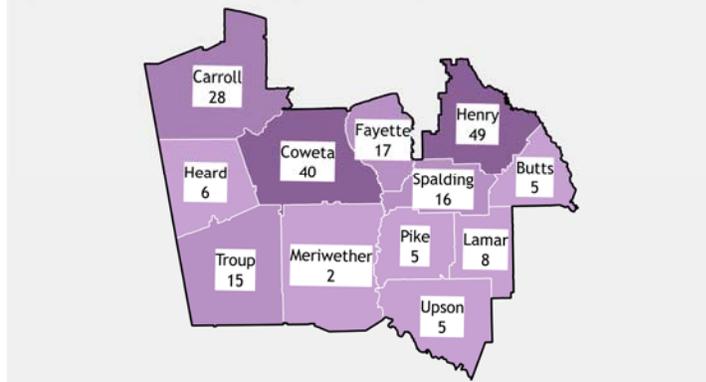
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 4-0

Figure 4-0-A: Location of District 4-0



Figure 4-0-B: Sampling per County, District 4-0, 2016



## Final Sample Determination

The original 2016 GIS sample for District 4-0 consisted of 196 children born in January of 2014 (Table 4-0-A). Of these, 7 children were determined to be ineligible for the study. Of those eligible, 5 children were unable to be located and were therefore excluded. The final sample size for District 4-0, which was used to calculate all rates, was 184. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 4-0, the UTD immunization rate by 24 months of age was 81.0%, which was higher than the 2015 rate (78.2%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 76.6%, lower than the 2015 rate (77.5%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 86.4%, higher than the 2015 rate (85.9%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 4-0-B and Figure 4-0-C). Rates that decreased in 2016 are shown as **red** in Table 4-0-B and Figure 4-0-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 4-0-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 3,362 vaccines doses administered to the District 4-0 cohort, 204 (6.1%) were administered by public health providers and 3,158 (93.9%) were administered by private providers.

Table 4-0-A: GIS Sampling Scheme, District 4-0, 2016

	2015	2016	State 2016
Original sample (n)	146	196	2742
Ineligible (n)	2	7	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	144	189	2527
Unable to locate <sup>†</sup> (n)	2	5	63
Final sample (n)	142	184	2464
Response rate (%)	98.6	97.4	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian.

Table 4-0-B: Immunization Rates by Series and Vaccine Antigen, District 4-0, 2016

	2015 n = 142 (%)	2016 n = 184 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	77.5 ± 6.9	<b>76.6 ± 5.4</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	78.2 ± 6.8	81.0 ± 5.0	82.1 ± 1.4
UTD immunization rate* by end of data collection†	85.9 ± 5.7	86.4 ± 4.4	91.0 ± 1.1
3 DTaP by 24 months	94.4 ± 3.8	<b>94.0 ± 3.0</b>	95.4 ± 0.8
4 DTaP by 24 months	79.6 ± 6.7	84.2 ± 4.6	84.3 ± 1.3
3 IPV by 24 months	94.4 ± 3.8	<b>94.0 ± 3.0</b>	94.5 ± 0.9
1 MMR by 24 months	88.0 ± 5.4	93.5 ± 3.1	93.1 ± 0.9
UTD Hib by 24 months	92.3 ± 4.4	<b>90.8 ± 3.7</b>	90.7 ± 1.1
3 Hep B by 24 months	94.4 ± 3.8	95.1 ± 2.7	95.0 ± 0.8
1 Varicella by 24 months	89.4 ± 5.1	92.4 ± 3.4	93.0 ± 1.0
UTD PCV by 24 months	89.4 ± 5.1	92.4 ± 3.4	91.4 ± 1.0
2 Hep A by 24 months	52.1 ± 8.2	60.9 ± 6.2	62.3 ± 1.8
2 Rotavirus by 24 months	85.2 ± 5.9	85.3 ± 4.5	85.3 ± 1.3
1+ Influenza by 24 months	61.3 ± 8.0	<b>48.9 ± 6.4</b>	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	76.8 ± 7.0	85.3 ± 4.5	83.6 ± 1.4

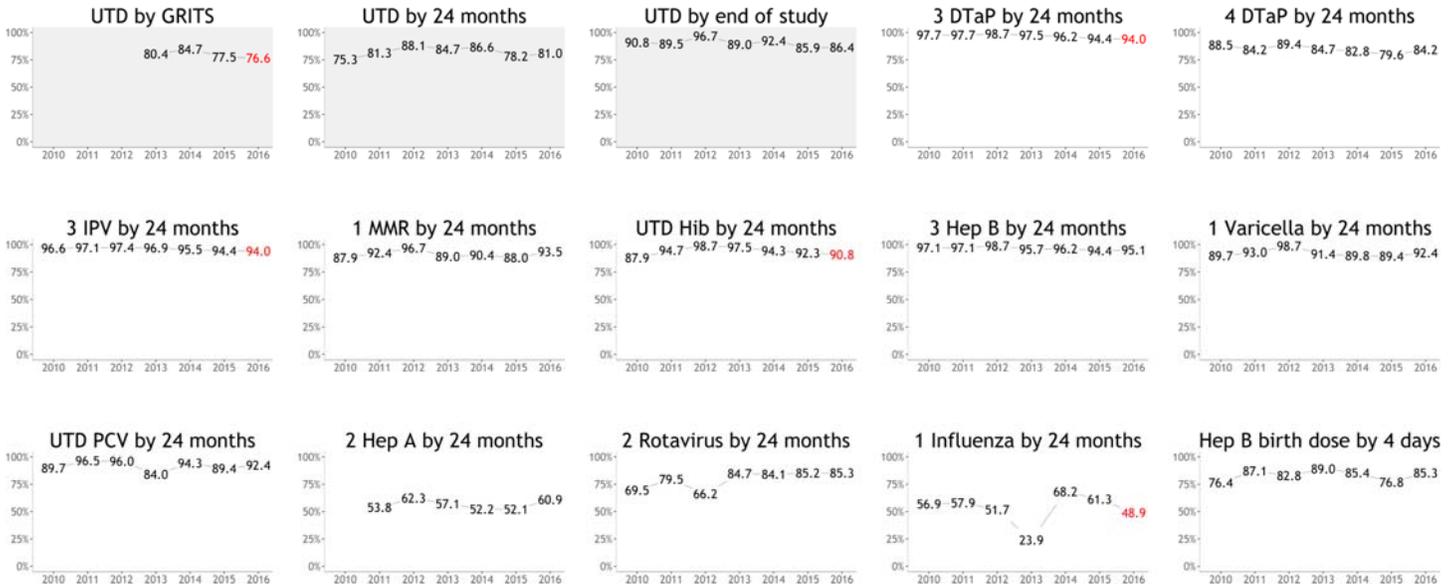
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 4-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 4-0, 2010-2016**



**Demographic Findings**

The demographic breakdown of the District 4-0 sample (and all District 4-0 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 4-0-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 4-0.

**Table 4-0-C: District 4-0 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		4-0 Sample † n = 184	All 2014 births † N = 9,511	GRITS alone n = 184 (%)	24 months n = 184 (%)	End of study n = 184 (%)
Mother's race*	White	109 (59.2%)	5951 (62.6%)	78.9 ± 6.8	83.5 ± 6.1	86.2 ± 5.7
	Black or African-American	63 (34.2%)	2933 (30.8%)	71.4 ± 9.8	76.2 ± 9.3	87.3 ± 7.2
	Asian	4 (2.2%)	222 (2.3%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	6 (3.3%)	245 (2.6%)	66.7 ± 33.0	66.7 ± 33.0	66.7 ± 33.0
Mother's ethnicity*	Non-Hispanic	172 (93.5%)	8727 (91.8%)	76.7 ± 5.6	81.4 ± 5.1	86.6 ± 4.5
	Hispanic	12 (6.5%)	701 (7.4%)	75.0 ± 22.0	75.0 ± 22.0	83.3 ± 19.0
Mother's age*	<25 years old	74 (40.2%)	3360 (35.3%)	73.0 ± 8.9	78.4 ± 8.3	85.1 ± 7.1
	25 - 35 years old	91 (49.5%)	4943 (52.0%)	76.9 ± 7.6	81.3 ± 7.1	86.8 ± 6.1
	35+ years old	19 (10.3%)	1208 (12.7%)	89.5 ± 12.0	89.5 ± 12.0	89.5 ± 12.0
Mother's education*	Some college or higher	91 (49.5%)	4911 (51.6%)	80.2 ± 7.2	85.7 ± 6.3	90.1 ± 5.4
	High School Graduate/GED	61 (33.2%)	3172 (33.4%)	70.5 ± 10.0	73.8 ± 9.7	82.0 ± 8.5
	9th - 11th grade	21 (11.4%)	1055 (11.1%)	76.2 ± 16.0	81.0 ± 15.0	85.7 ± 13.0
	<9th grade	5 (2.7%)	186 (2.0%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	87 (47.3%)	5189 (54.6%)	78.2 ± 7.7	81.6 ± 7.2	83.9 ± 6.8
	Unmarried	96 (52.2%)	4296 (45.2%)	76.0 ± 7.5	81.2 ± 6.9	89.6 ± 5.4
Child's WIC status	WIC	97 (52.7%)		78.4 ± 7.2	81.4 ± 6.8	87.6 ± 5.8
	Non-WIC	87 (47.3%)		74.7 ± 8.1	80.5 ± 7.3	85.1 ± 6.6
Number of provider(s) visited	One	120 (65.2%)		79.2 ± 6.4	82.5 ± 6.0	87.5 ± 5.2
	Two	46 (25.0%)		73.9 ± 11.0	80.4 ± 10.0	89.1 ± 7.9
	Three or more	13 (7.1%)		84.6 ± 17.0	84.6 ± 17.0	84.6 ± 17.0
Type of provider(s) visited	Private	155 (84.2%)		80.6 ± 5.5	<b>85.2 ± 4.9</b>	90.3 ± 4.1
	Public	5 (2.7%)		80.0 ± 31.0	80.0 ± 31.0	80.0 ± 31.0
	Both	19 (10.3%)		57.9 ± 20.0	<b>57.9 ± 20.0</b>	68.4 ± 18.0

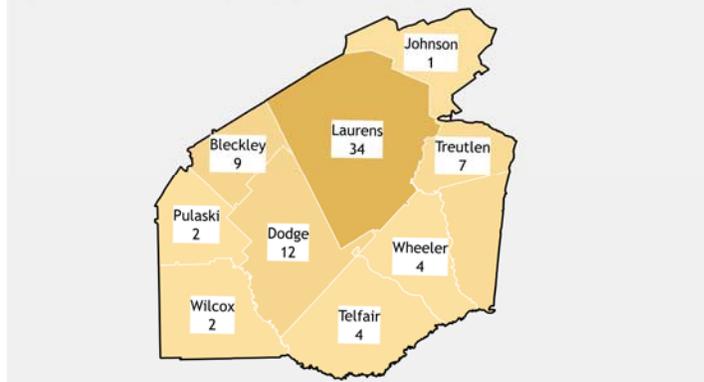
† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 5-1

Figure 5-1-A: Location of District 5-1



Figure 5-1-B: Sampling per County, District 5-1, 2016



## Final Sample Determination

The original 2016 GIS sample for District 5-1 consisted of 82 children born in January of 2014 (Table 5-1-A). Of these, 6 children were determined to be ineligible for the study. Of those eligible, 1 child was unable to be located and was therefore excluded. The final sample size for District 5-1, which was used to calculate all rates, was 75. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 5-1, the UTD immunization rate by 24 months of age was 74.7%, which was higher than the 2015 rate (70.8%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 73.3%, higher than the 2015 rate (70.8%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 86.7%, lower than the 2015 rate (91.7%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 5-1-B and Figure 5-1-C). Rates that decreased in 2016 are shown as **red** in Table 5-1-B and Figure 5-1-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 5-1-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 1,316 vaccines doses administered to the District 5-1 cohort, 111 (8.4%) were administered by public health providers and 1,205 (91.6%) were administered by private providers.

Table 5-1-A: GIS Sampling Scheme, District 5-1, 2016

	2015	2016	State 2016
Original sample (n)	77	82	2742
Ineligible (n)	3	6	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	74	76	2527
Unable to locate <sup>†</sup> (n)	2	1	63
Final sample (n)	72	75	2464
Response rate (%)	97.3	98.7	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 5-1-B: Immunization Rates by Series and Vaccine Antigen, District 5-1, 2016

	2015 n = 72 (%)	2016 n = 75 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	70.8 ± 11.0	73.3 ± 5.9	76.5 ± 1.6
UTD immunization rate* by 24 months	70.8 ± 11.0	74.7 ± 5.8	<b>82.1 ± 1.4</b>
UTD immunization rate* by end of data collection†	91.7 ± 6.4	<b>86.7 ± 4.6</b>	91.0 ± 1.1
3 DTaP by 24 months	95.8 ± 4.6	<b>93.3 ± 3.4</b>	95.4 ± 0.8
4 DTaP by 24 months	75.0 ± 10.0	<b>74.7 ± 5.8</b>	<b>84.3 ± 1.3</b>
3 IPV by 24 months	93.1 ± 5.9	<b>93.3 ± 3.4</b>	94.5 ± 0.9
1 MMR by 24 months	91.7 ± 6.4	<b>90.7 ± 3.9</b>	93.1 ± 0.9
UTD Hib by 24 months	88.9 ± 7.3	<b>80.0 ± 5.4</b>	<b>90.7 ± 1.1</b>
3 Hep B by 24 months	95.8 ± 4.6	97.3 ± 2.2	95.0 ± 0.8
1 Varicella by 24 months	91.7 ± 6.4	<b>90.7 ± 3.9</b>	93.0 ± 1.0
UTD PCV by 24 months	88.9 ± 7.3	<b>85.3 ± 4.8</b>	<b>91.4 ± 1.0</b>
2 Hep A by 24 months	50.0 ± 12.0	54.7 ± 6.7	62.3 ± 1.8
2 Rotavirus by 24 months	87.5 ± 7.7	88.0 ± 4.4	85.3 ± 1.3
1+ Influenza by 24 months	52.8 ± 12.0	<b>46.7 ± 6.7</b>	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	93.1 ± 5.9	96.0 ± 2.6	<b>83.6 ± 1.4</b>

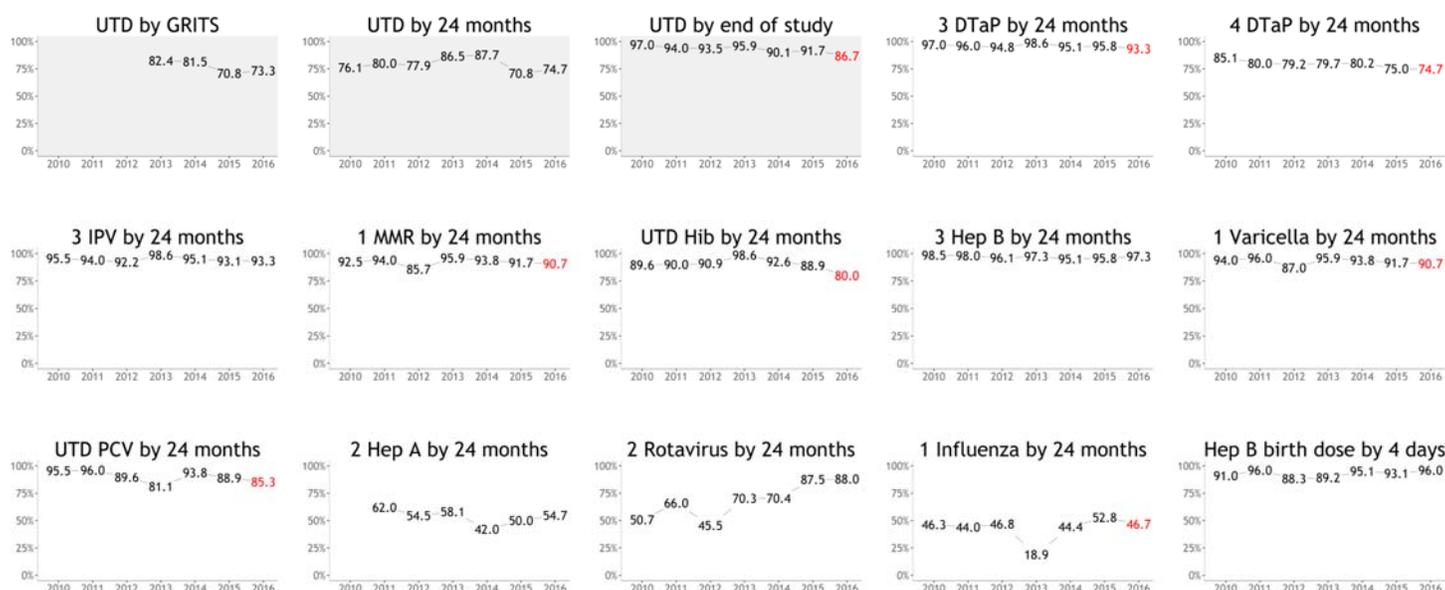
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 5-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 5-1, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 5-1 sample (and all District 5-1 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 5-1-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 5-1-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 5-1-C: District 5-1 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		5-1 Sample ‡ n = 75	All 2014 births ‡ N = 1,574	GRITS alone n = 75 (%)	24 months n = 75 (%)	End of study n = 75 (%)
Mother's race*	White	43 (57.3%)	944 (60.0%)	69.8 ± 8.2	72.1 ± 8.0	86.0 ± 6.1
	Black or African-American	30 (40.0%)	594 (37.7%)	76.7 ± 9.0	76.7 ± 9.0	86.7 ± 7.2
	Asian	1 (1.3%)	14 (0.9%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	1 (1.3%)	19 (1.2%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	75 (100%)	1506 (95.7%)	73.3 ± 5.9	74.7 ± 5.8	86.7 ± 4.6
	Hispanic		63 (4.0%)			
Mother's age*	<25 years old	33 (44.0%)	695 (44.2%)	72.7 ± 9.0	72.7 ± 9.0	90.9 ± 5.8
	25 - 35 years old	37 (49.3%)	744 (47.3%)	75.7 ± 8.2	78.4 ± 7.9	83.8 ± 7.1
	35+ years old	5 (6.7%)	135 (8.6%)	60.0 ± 25.0	60.0 ± 25.0	80.0 ± 21.0
Mother's education*	Some college or higher	38 (50.7%)	641 (40.7%)	78.9 ± 7.7	81.6 ± 7.3	92.1 ± 5.1
	High School Graduate/GED	22 (29.3%)	575 (36.5%)	68.2 ± 12.0	68.2 ± 12.0	81.8 ± 9.6
	9th - 11th grade	7 (9.3%)	270 (17.2%)	71.4 ± 20.0	71.4 ± 20.0	85.7 ± 15.0
	<9th grade	1 (1.3%)	41 (2.6%)	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
Marital status*	Married	32 (42.7%)	709 (45.0%)	71.9 ± 9.2	75.0 ± 8.9	90.6 ± 6.0
	Unmarried	40 (53.3%)	848 (53.9%)	75.0 ± 8.0	75.0 ± 8.0	85.0 ± 6.6
Child's WIC status	WIC	48 (64.0%)		68.8 ± 7.8	68.8 ± 7.8	85.4 ± 5.9
	Non-WIC	27 (36.0%)		81.5 ± 8.7	85.2 ± 8.0	88.9 ± 7.0
Number of provider(s) visited	One	46 (61.3%)		78.3 ± 7.1	78.3 ± 7.1	89.1 ± 5.3
	Two	23 (30.7%)		60.9 ± 12.0	65.2 ± 12.0	82.6 ± 9.2
	Three or more	5 (6.7%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Type of provider(s) visited	Private	56 (74.7%)		78.6 ± 6.4	<b>80.4 ± 6.2</b>	89.3 ± 4.8
	Public	1 (1.3%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Both	17 (22.7%)		58.8 ± 14.0	<b>58.8 ± 14.0</b>	82.4 ± 11.0

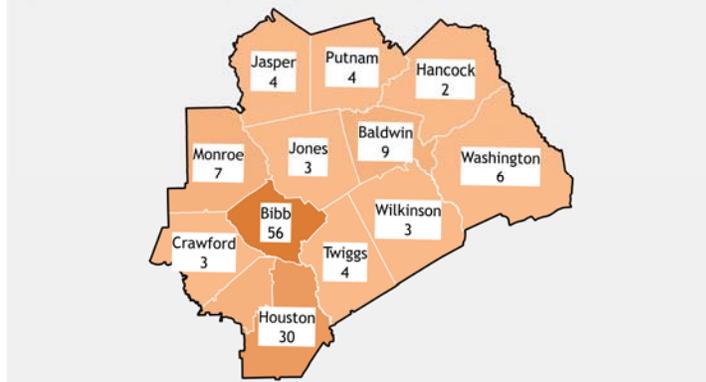
‡ Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery  
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 5-2

Figure 5-2-A: Location of District 5-2



Figure 5-2-B: Sampling per County, District 5-2, 2016



## Final Sample Determination

The original 2016 GIS sample for District 5-2 consisted of 138 children born in January of 2014 (Table 5-2-A). Of these, 10 children were determined to be ineligible for the study. Of those eligible, 5 children were unable to be located and were therefore excluded. The final sample size for District 5-2, which was used to calculate all rates, was 123. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 5-2, the UTD immunization rate by 24 months of age was 81.3%, which was lower than the 2015 rate (86.7%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 72.4%, lower than the 2015 rate (85.5%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 86.2%, lower than the 2015 rate (94.0%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 5-2-B and Figure 5-2-C). Rates that decreased in 2016 are shown as **red** in Table 5-2-B and Figure 5-2-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 5-2-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,231 vaccines doses administered to the District 5-2 cohort, 93 (4.2%) were administered by public health providers and 2,138 (95.8%) were administered by private providers.

Table 5-2-A: GIS Sampling Scheme, District 5-2, 2016

	2015	2016	State 2016
Original sample (n)	84	138	2742
Ineligible (n)	0	10	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	84	128	2527
Unable to locate <sup>†</sup> (n)	1	5	63
Final sample (n)	83	123	2464
Response rate (%)	98.8	96.1	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 5-2-B: Immunization Rates by Series and Vaccine Antigen, District 5-2, 2016

	2015 n = 83 (%)	2016 n = 123 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	85.5 ± 7.6	<b>72.4 ± 7.0</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	86.7 ± 7.3	<b>81.3 ± 6.1</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection <sup>†</sup>	94.0 ± 5.1	<b>86.2 ± 5.4</b>	91.0 ± 1.1
3 DTaP by 24 months	97.6 ± 3.3	<b>95.9 ± 3.1</b>	95.4 ± 0.8
4 DTaP by 24 months	88.0 ± 7.0	<b>83.7 ± 5.8</b>	84.3 ± 1.3
3 IPV by 24 months	97.6 ± 3.3	<b>95.9 ± 3.1</b>	94.5 ± 0.9
1 MMR by 24 months	90.4 ± 6.4	91.9 ± 4.3	93.1 ± 0.9
UTD Hib by 24 months	95.2 ± 4.6	<b>90.2 ± 4.6</b>	90.7 ± 1.1
3 Hep B by 24 months	96.4 ± 4.0	<b>94.3 ± 3.6</b>	95.0 ± 0.8
1 Varicella by 24 months	90.4 ± 6.4	91.9 ± 4.3	93.0 ± 1.0
UTD PCV by 24 months	90.4 ± 6.4	<b>90.2 ± 4.6</b>	91.4 ± 1.0
2 Hep A by 24 months	56.6 ± 11.0	65.9 ± 7.4	62.3 ± 1.8
2 Rotavirus by 24 months	84.3 ± 7.9	<b>82.9 ± 5.9</b>	85.3 ± 1.3
1+ Influenza by 24 months	61.4 ± 10.0	<b>52.8 ± 7.8</b>	58.8 ± 1.8
Hep B birth dose by 4 days	96.4 ± 4.0	<b>92.7 ± 4.1</b>	<b>83.6 ± 1.4</b>

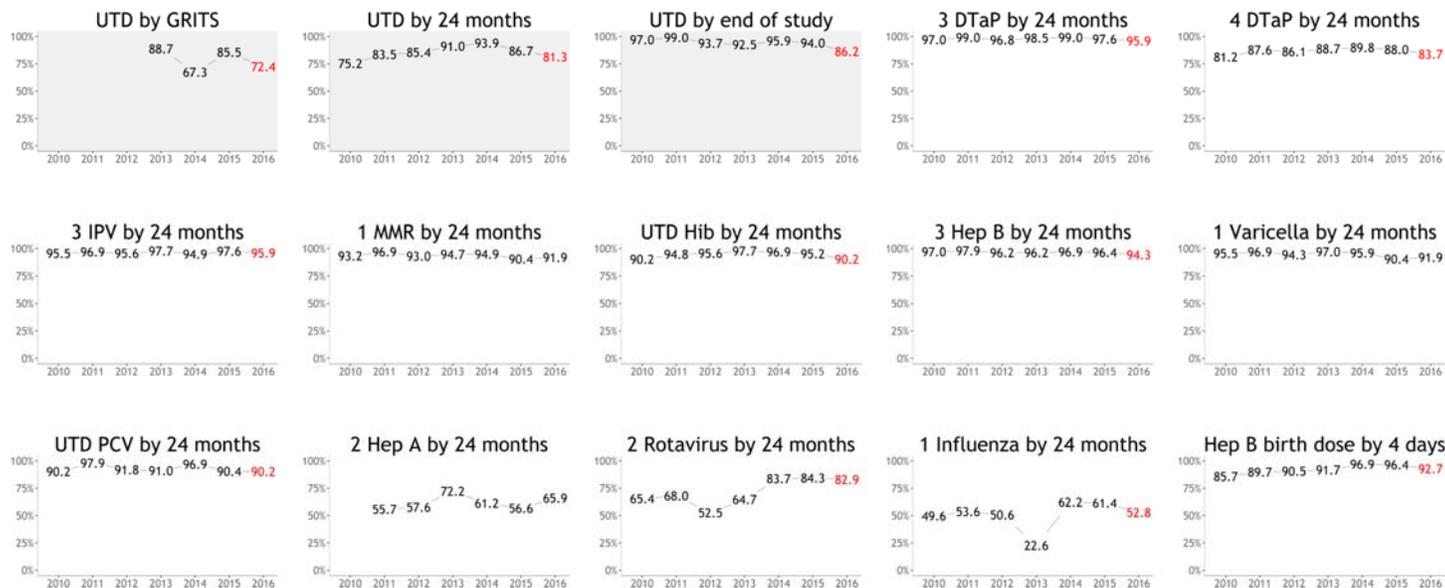
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 5-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 5-2, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 5-2 sample (and all District 5-2 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 5-2-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 5-2-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 5-2-C: District 5-2 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		5-2 Sample † n = 123	All 2014 births † N = 6,439	GRITS alone n = 123 (%)	24 months n = 123 (%)	End of study n = 123 (%)
Mother's race*	White	52 (42.3%)	3107 (48.3%)	69.2 ± 11.0	84.6 ± 8.6	88.5 ± 7.7
	Black or African-American	66 (53.7%)	3016 (46.8%)	75.8 ± 9.1	80.3 ± 8.5	86.4 ± 7.3
	Asian	3 (2.4%)	114 (1.8%)	66.7 ± 47.0	66.7 ± 47.0	66.7 ± 47.0
	Multiracial	2 (1.6%)	154 (2.4%)	50.0 ± 61.0	50.0 ± 61.0	50.0 ± 61.0
Mother's ethnicity*	Non-Hispanic	115 (93.5%)	6065 (94.2%)	71.3 ± 7.3	80.9 ± 6.3	86.1 ± 5.6
	Hispanic	8 (6.5%)	357 (5.5%)	87.5 ± 20.0	87.5 ± 20.0	87.5 ± 20.0
Mother's age*	<25 years old	43 (35.0%)	2452 (38.1%)	79.1 ± 11.0	86.0 ± 9.1	93.0 ± 6.7
	25 - 35 years old	64 (52.0%)	3313 (51.5%)	70.3 ± 9.9	82.8 ± 8.2	85.9 ± 7.5
	35+ years old	16 (13.0%)	674 (10.5%)	62.5 ± 21.0	62.5 ± 21.0	68.8 ± 20.0
Mother's education*	Some college or higher	64 (52.0%)	3214 (49.9%)	70.3 ± 9.9	82.8 ± 8.2	85.9 ± 7.5
	High School Graduate/GED	41 (33.3%)	2028 (31.5%)	73.2 ± 12.0	78.0 ± 11.0	82.9 ± 10.0
	9th - 11th grade	13 (10.6%)	973 (15.1%)	76.9 ± 20.0	84.6 ± 17.0	100.0 ± 0.0
	<9th grade	4 (3.3%)	163 (2.5%)	75.0 ± 37.0	75.0 ± 37.0	75.0 ± 37.0
Marital status*	Married	42 (34.1%)	2917 (45.3%)	66.7 ± 13.0	76.2 ± 11.0	78.6 ± 11.0
	Unmarried	80 (65.0%)	3490 (54.2%)	76.2 ± 8.2	83.7 ± 7.1	90.0 ± 5.8
Child's WIC status	WIC	76 (61.8%)		75.0 ± 8.6	78.9 ± 8.1	84.2 ± 7.2
	Non-WIC	47 (38.2%)		68.1 ± 12.0	85.1 ± 9.0	89.4 ± 7.8
Number of provider(s) visited	One	77 (62.6%)		70.1 ± 9.0	80.5 ± 7.8	83.1 ± 7.4
	Two	33 (26.8%)		90.9 ± 8.6	<b>93.9 ± 7.2</b>	97.0 ± 5.2
	Three or more	9 (7.3%)		55.6 ± 29.0	<b>55.6 ± 29.0</b>	88.9 ± 18.0
Type of provider(s) visited	Private	107 (87.0%)		75.7 ± 7.2	84.1 ± 6.1	86.9 ± 5.6
	Public	1 (0.8%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Both	11 (8.9%)		63.6 ± 25.0	63.6 ± 25.0	90.9 ± 15.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

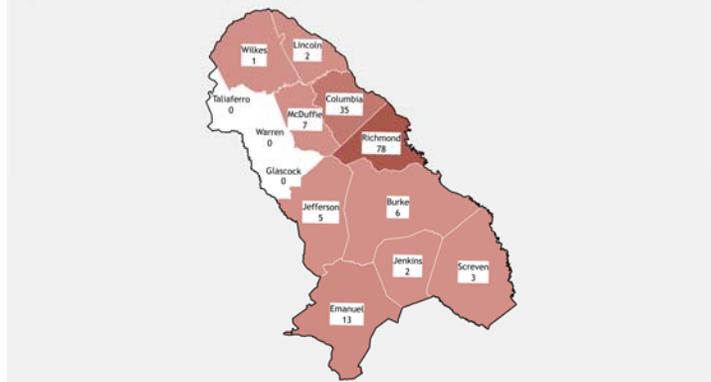
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 6-0

Figure 6-0-A: Location of District 6-0



Figure 6-0-B: Sampling per County, District 6-0, 2016



## Final Sample Determination

The original 2016 GIS sample for District 6-0 consisted of 152 children born in January of 2014 (Table 6-0-A). Of these, 9 children were determined to be ineligible for the study. Of those eligible, 3 children were unable to be located and were therefore excluded. The final sample size for District 6-0, which was used to calculate all rates, was 140. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 6-0, the UTD immunization rate by 24 months of age was 79.3%, which was lower than the 2015 rate (85.2%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 75.7%, higher than the 2015 rate (69.3%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 92.1%, lower than the 2015 rate (95.5%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 6-0-B and Figure 6-0-C). Rates that decreased in 2016 are shown as **red** in Table 6-0-B and Figure 6-0-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 6-0-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,652 vaccines doses administered to the District 6-0 cohort, 196 (7.4%) were administered by public health providers and 2,456 (92.6%) were administered by private providers.

Table 6-0-A: GIS Sampling Scheme, District 6-0, 2016

	2015	2016	State 2016
Original sample (n)	102	152	2742
Ineligible (n)	8	9	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	94	143	2527
Unable to locate <sup>†</sup> (n)	6	3	63
Final sample (n)	88	140	2464
Response rate (%)	93.6	97.9	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 6-0-B: Immunization Rates by Series and Vaccine Antigen, District 6-0, 2016

	2015 n = 88 (%)	2016 n = 140 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	69.3 ± 9.7	75.7 ± 6.1	76.5 ± 1.6
UTD immunization rate* by 24 months	85.2 ± 7.5	<b>79.3 ± 5.8</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection <sup>†</sup>	95.5 ± 4.4	<b>92.1 ± 3.9</b>	91.0 ± 1.1
3 DTaP by 24 months	95.5 ± 4.4	95.7 ± 2.9	95.4 ± 0.8
4 DTaP by 24 months	87.5 ± 6.9	<b>80.7 ± 5.7</b>	84.3 ± 1.3
3 IPV by 24 months	95.5 ± 4.4	95.7 ± 2.9	94.5 ± 0.9
1 MMR by 24 months	94.3 ± 4.9	<b>90.7 ± 4.2</b>	93.1 ± 0.9
UTD Hib by 24 months	<b>96.6 ± 3.8</b>	<b>86.4 ± 4.9</b>	90.7 ± 1.1
3 Hep B by 24 months	97.7 ± 3.1	99.3 ± 1.2	<b>95.0 ± 0.8</b>
1 Varicella by 24 months	96.6 ± 3.8	<b>93.6 ± 3.5</b>	93.0 ± 1.0
UTD PCV by 24 months	90.9 ± 6.0	<b>87.9 ± 4.7</b>	91.4 ± 1.0
2 Hep A by 24 months	48.9 ± 10.0	54.3 ± 7.1	62.3 ± 1.8
2 Rotavirus by 24 months	95.5 ± 4.4	<b>87.1 ± 4.8</b>	85.3 ± 1.3
1+ Influenza by 24 months	64.8 ± 10.0	65.0 ± 6.8	58.8 ± 1.8
Hep B birth dose by 4 days	78.4 ± 8.6	82.9 ± 5.4	83.6 ± 1.4

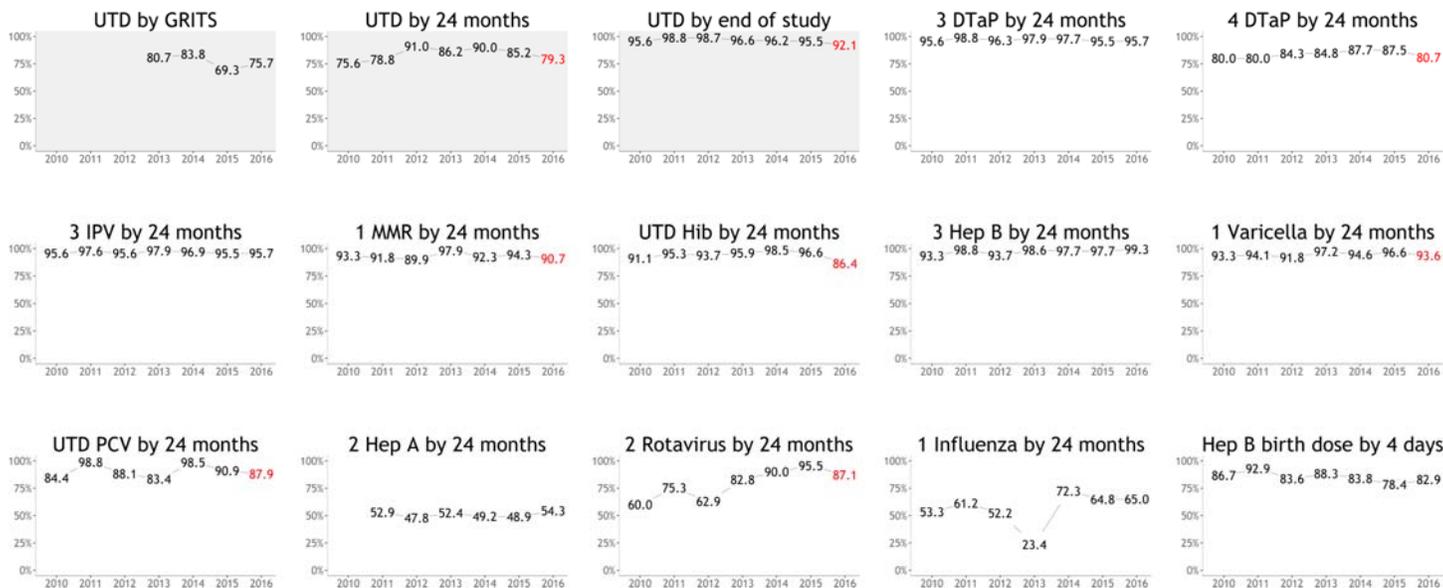
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 6-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 6-0, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 6-0 sample (and all District 6-0 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 6-0-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 6-0-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 6-0-C: District 6-0 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		6-0 Sample † n = 140	All 2014 births † N = 6,245	GRITS alone n = 140 (%)	24 months n = 140 (%)	End of study n = 140 (%)
Mother's race*	White	66 (47.1%)	3122 (50.0%)	84.8 ± 7.5	<b>87.9 ± 6.8</b>	93.9 ± 5.0
	Black or African-American	60 (42.9%)	2721 (43.6%)	65.0 ± 10.0	<b>70.0 ± 10.0</b>	91.7 ± 6.1
	Asian	6 (4.3%)	139 (2.2%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	6 (4.3%)	184 (2.9%)	50.0 ± 35.0	50.0 ± 35.0	66.7 ± 33.0
Mother's ethnicity*	Non-Hispanic	130 (92.9%)	5809 (93.0%)	75.4 ± 6.4	79.2 ± 6.0	92.3 ± 4.0
	Hispanic	10 (7.1%)	358 (5.7%)	80.0 ± 21.0	80.0 ± 21.0	90.0 ± 16.0
Mother's age*	<25 years old	60 (42.9%)	2292 (36.7%)	68.3 ± 10.0	70.0 ± 10.0	85.0 ± 7.8
	25 - 35 years old	68 (48.6%)	3328 (53.3%)	79.4 ± 8.3	85.3 ± 7.3	97.1 ± 3.5
	35+ years old	12 (8.6%)	625 (10.0%)	91.7 ± 14.0	91.7 ± 14.0	100.0 ± 0.0
Mother's education*	Some college or higher	70 (50.0%)	3349 (53.6%)	85.7 ± 7.1	<b>91.4 ± 5.7</b>	98.6 ± 2.4
	High School Graduate/GED	44 (31.4%)	1898 (30.4%)	63.6 ± 12.0	<b>65.9 ± 12.0</b>	86.4 ± 8.8
	9th - 11th grade	16 (11.4%)	815 (13.1%)	81.2 ± 17.0	81.2 ± 17.0	93.8 ± 10.0
	<9th grade	3 (2.1%)	110 (1.8%)	66.7 ± 46.0	66.7 ± 46.0	100.0 ± 0.0
Marital status*	Married	60 (42.9%)	3010 (48.2%)	85.0 ± 7.8	<b>90.0 ± 6.6</b>	96.7 ± 3.9
	Unmarried	80 (57.1%)	3213 (51.4%)	68.8 ± 8.8	<b>71.2 ± 8.6</b>	88.8 ± 6.0
Child's WIC status	WIC	83 (59.3%)		73.5 ± 8.2	75.9 ± 8.0	94.0 ± 4.4
	Non-WIC	57 (40.7%)		78.9 ± 9.2	84.2 ± 8.2	89.5 ± 6.9
Number of provider(s) visited	One	91 (65.0%)		79.1 ± 7.2	81.3 ± 6.9	93.4 ± 4.4
	Two	34 (24.3%)		64.7 ± 14.0	70.6 ± 13.0	91.2 ± 8.3
	Three or more	10 (7.1%)		90.0 ± 16.0	90.0 ± 16.0	90.0 ± 16.0
Type of provider(s) visited	Private	116 (82.9%)		79.3 ± 6.4	81.9 ± 6.1	94.0 ± 3.8
	Public	5 (3.6%)		60.0 ± 37.0	60.0 ± 37.0	100.0 ± 0.0
	Both	14 (10.0%)		57.1 ± 22.0	64.3 ± 22.0	78.6 ± 19.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

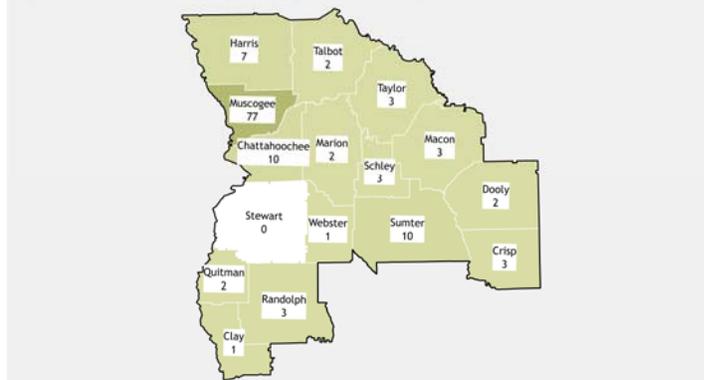
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 7-0

Figure 7-0-A: Location of District 7-0



Figure 7-0-B: Sampling per County, District 7-0, 2016



## Final Sample Determination

The original 2016 GIS sample for District 7-0 consisted of 129 children born in January of 2014 (Table 7-0-A). Of these, 27 children were determined to be ineligible for the study. The final sample size for District 7-0, which was used to calculate all rates, was 102. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a smaller sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 7-0, the UTD immunization rate by 24 months of age was 89.2%, which was higher than the 2015 rate (85.3%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 79.4%, higher than the 2015 rate (77.5%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 96.1%, higher than the 2015 rate (95.3%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 7-0-B and Figure 7-0-C). Rates that decreased in 2016 are shown as **red** in Table 7-0-B and Figure 7-0-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 7-0-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,035 vaccine doses administered to the District 7-0 cohort, 137 (6.7%) were administered by public health providers and 1,898 (93.3%) were administered by private providers.

Table 7-0-A: GIS Sampling Scheme, District 7-0, 2016

	2015	2016	State 2016
Original sample (n)	148	129	2742
Ineligible (n)	17	27	215
(Refused to participate) (n)	3	1	12
Eligible sample (n)	131	102	2527
Unable to locate <sup>†</sup> (n)	2	0	63
Final sample (n)	129	102	2464
Response rate (%)	98.5	100	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 7-0-B: Immunization Rates by Series and Vaccine Antigen, District 7-0, 2016

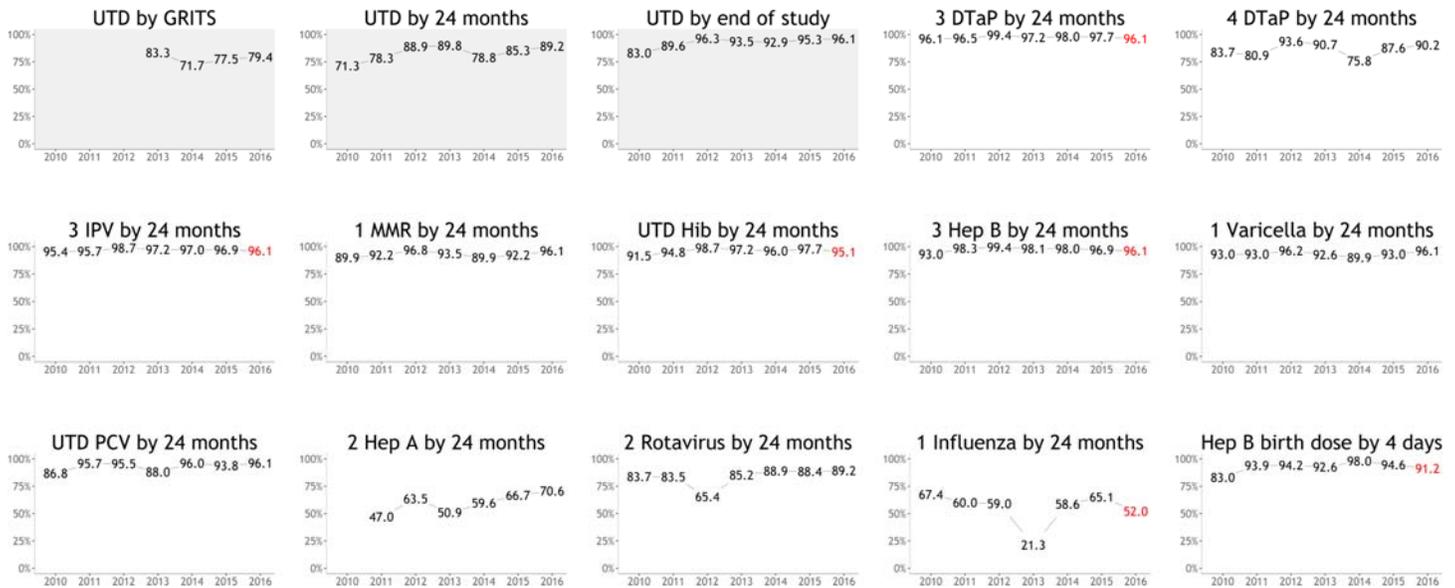
	2015 n = 129 (%)	2016 n = 102 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	77.5 ± 7.2	79.4 ± 6.7	76.5 ± 1.6
UTD immunization rate* by 24 months	85.3 ± 6.1	89.2 ± 5.1	<b>82.1 ± 1.4</b>
UTD immunization rate* by end of data collection <sup>†</sup>	95.3 ± 3.6	96.1 ± 3.2	<b>91.0 ± 1.1</b>
3 DTaP by 24 months	97.7 ± 2.6	<b>96.1 ± 3.2</b>	95.4 ± 0.8
4 DTaP by 24 months	87.6 ± 5.7	90.2 ± 4.9	84.3 ± 1.3
3 IPV by 24 months	96.9 ± 3.0	<b>96.1 ± 3.2</b>	94.5 ± 0.9
1 MMR by 24 months	92.2 ± 4.6	96.1 ± 3.2	93.1 ± 0.9
UTD Hib by 24 months	97.7 ± 2.6	<b>95.1 ± 3.6</b>	90.7 ± 1.1
3 Hep B by 24 months	96.9 ± 3.0	<b>96.1 ± 3.2</b>	95.0 ± 0.8
1 Varicella by 24 months	93.0 ± 4.4	96.1 ± 3.2	93.0 ± 1.0
UTD PCV by 24 months	93.8 ± 4.2	96.1 ± 3.2	<b>91.4 ± 1.0</b>
2 Hep A by 24 months	66.7 ± 8.2	70.6 ± 7.5	62.3 ± 1.8
2 Rotavirus by 24 months	88.4 ± 5.6	89.2 ± 5.1	85.3 ± 1.3
1+ Influenza by 24 months	65.1 ± 8.3	<b>52.0 ± 8.3</b>	58.8 ± 1.8
Hep B birth dose by 4 days	94.6 ± 3.9	<b>91.2 ± 4.7</b>	<b>83.6 ± 1.4</b>

<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 7-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 7-0, 2010-2016****Demographic Findings**

The demographic breakdown of the District 7-0 sample (and all District 7-0 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 7-0-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 7-0.

**Table 7-0-C: District 7-0 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		7-0 Sample † n = 102	All 2014 births † N = 4,231	GRITS alone n = 102 (%)	24 months n = 102 (%)	End of study n = 102 (%)
Mother's race*	White	48 (47.1%)	1859 (43.9%)	81.2 ± 9.4	91.7 ± 6.7	97.9 ± 3.4
	Black or African-American	49 (48.0%)	2089 (49.4%)	75.5 ± 10.0	85.7 ± 8.3	93.9 ± 5.7
	Asian	1 (1.0%)	89 (2.1%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	4 (3.9%)	157 (3.7%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	93 (91.2%)	3914 (92.5%)	78.5 ± 7.1	89.2 ± 5.4	95.7 ± 3.5
	Hispanic	9 (8.8%)	303 (7.2%)	88.9 ± 17.0	88.9 ± 17.0	100.0 ± 0.0
Mother's age*	<25 years old	35 (34.3%)	1804 (42.6%)	77.1 ± 12.0	85.7 ± 9.9	94.3 ± 6.6
	25 - 35 years old	51 (50.0%)	2022 (47.8%)	84.3 ± 8.5	92.2 ± 6.3	96.1 ± 4.5
	35+ years old	16 (15.7%)	405 (9.6%)	68.8 ± 19.0	87.5 ± 14.0	100.0 ± 0.0
Mother's education*	Some college or higher	43 (42.2%)	2006 (47.4%)	79.1 ± 10.0	95.3 ± 5.4	97.7 ± 3.8
	High School Graduate/GED	40 (39.2%)	1420 (33.6%)	77.5 ± 11.0	85.0 ± 9.4	95.0 ± 5.8
	9th - 11th grade	12 (11.8%)	609 (14.4%)	75.0 ± 21.0	75.0 ± 21.0	91.7 ± 13.0
	<9th grade	3 (2.9%)	121 (2.9%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	47 (46.1%)	1800 (42.5%)	80.9 ± 9.6	93.6 ± 6.0	97.9 ± 3.5
	Unmarried	53 (52.0%)	2404 (56.8%)	79.2 ± 9.3	86.8 ± 7.8	94.3 ± 5.3
Child's WIC status	WIC	73 (71.6%)		82.2 ± 7.5	87.7 ± 6.4	95.9 ± 3.9
	Non-WIC	29 (28.4%)		72.4 ± 14.0	93.1 ± 7.9	96.6 ± 5.7
Number of provider(s) visited	One	56 (54.9%)		85.7 ± 7.8	92.9 ± 5.7	98.2 ± 3.0
	Two	34 (33.3%)		76.5 ± 12.0	88.2 ± 9.2	94.1 ± 6.7
	Three or more	11 (10.8%)		63.6 ± 24.0	81.8 ± 19.0	100.0 ± 0.0
Type of provider(s) visited	Private	82 (80.4%)		80.5 ± 7.3	92.7 ± 4.8	97.6 ± 2.8
	Public	1 (1.0%)		0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
	Both	18 (17.6%)		83.3 ± 15.0	83.3 ± 15.0	100.0 ± 0.0

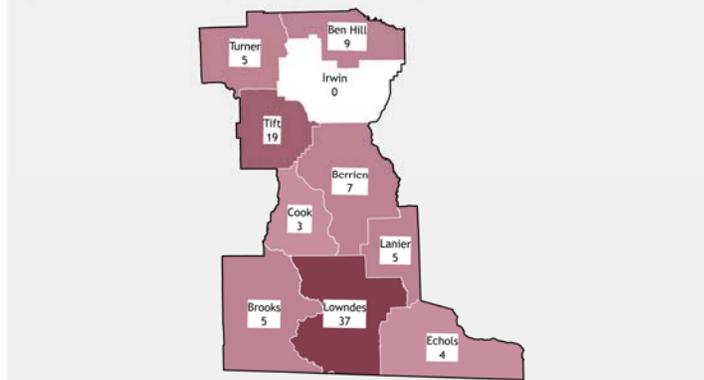
† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 8-1

Figure 8-1-A: Location of District 8-1



Figure 8-1-B: Sampling per County, District 8-1, 2016



## Final Sample Determination

The original 2016 GIS sample for District 8-1 consisted of 94 children born in January of 2014 (Table 8-1-A). Of these, 1 child was determined to be ineligible for the study. The final sample size for District 8-1, which was used to calculate all rates, was 93. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a smaller sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 8-1, the UTD immunization rate by 24 months of age was 91.4%, which was higher than the 2015 rate (89.6%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 90.3%, higher than the 2015 rate (89.6%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 96.8%, higher than the 2015 rate (96.2%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 8-1-B and Figure 8-1-C). Rates that decreased in 2016 are shown as **red** in Table 8-1-B and Figure 8-1-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 8-1-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 1,889 vaccine doses administered to the District 8-1 cohort, 72 (3.8%) were administered by public health providers and 1,817 (96.2%) were administered by private providers.

Table 8-1-A: GIS Sampling Scheme, District 8-1, 2016

	2015	2016	State 2016
Original sample (n)	115	94	2742
Ineligible (n)	3	1	215
(Refused to participate) (n)	0	1	12
Eligible sample (n)	112	93	2527
Unable to locate <sup>†</sup> (n)	6	0	63
Final sample (n)	106	93	2464
Response rate (%)	94.6	100	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 8-1-B: Immunization Rates by Series and Vaccine Antigen, District 8-1, 2016

	2015 n = 106 (%)	2016 n = 93 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	89.6 ± 5.8	90.3 ± 5.0	<b><i>76.5 ± 1.6</i></b>
UTD immunization rate* by 24 months	89.6 ± 5.8	91.4 ± 4.7	<b><i>82.1 ± 1.4</i></b>
UTD immunization rate* by end of data collection <sup>†</sup>	96.2 ± 3.6	96.8 ± 3.0	<b><i>91.0 ± 1.1</i></b>
3 DTaP by 24 months	98.1 ± 2.6	<b>97.8 ± 2.4</b>	95.4 ± 0.8
4 DTaP by 24 months	92.5 ± 5.1	<b>91.4 ± 4.7</b>	<b><i>84.3 ± 1.3</i></b>
3 IPV by 24 months	98.1 ± 2.6	<b>97.8 ± 2.4</b>	94.5 ± 0.9
1 MMR by 24 months	95.3 ± 4.1	97.8 ± 2.4	<b><i>93.1 ± 0.9</i></b>
UTD Hib by 24 months	96.2 ± 3.6	96.8 ± 3.0	<b><i>90.7 ± 1.1</i></b>
3 Hep B by 24 months	99.1 ± 1.8	<b>98.9 ± 1.7</b>	<b><i>95.0 ± 0.8</i></b>
1 Varicella by 24 months	96.2 ± 3.6	97.8 ± 2.4	<b><i>93.0 ± 1.0</i></b>
UTD PCV by 24 months	95.3 ± 4.1	<b>94.6 ± 3.8</b>	91.4 ± 1.0
2 Hep A by 24 months	65.1 ± 9.1	75.3 ± 7.3	<b><i>62.3 ± 1.8</i></b>
2 Rotavirus by 24 months	89.6 ± 5.8	93.5 ± 4.1	<b><i>85.3 ± 1.3</i></b>
1+ Influenza by 24 months	64.2 ± 9.2	74.2 ± 7.4	<b><i>58.8 ± 1.8</i></b>
Hep B birth dose by 4 days	92.5 ± 5.1	97.8 ± 2.4	<b><i>83.6 ± 1.4</i></b>

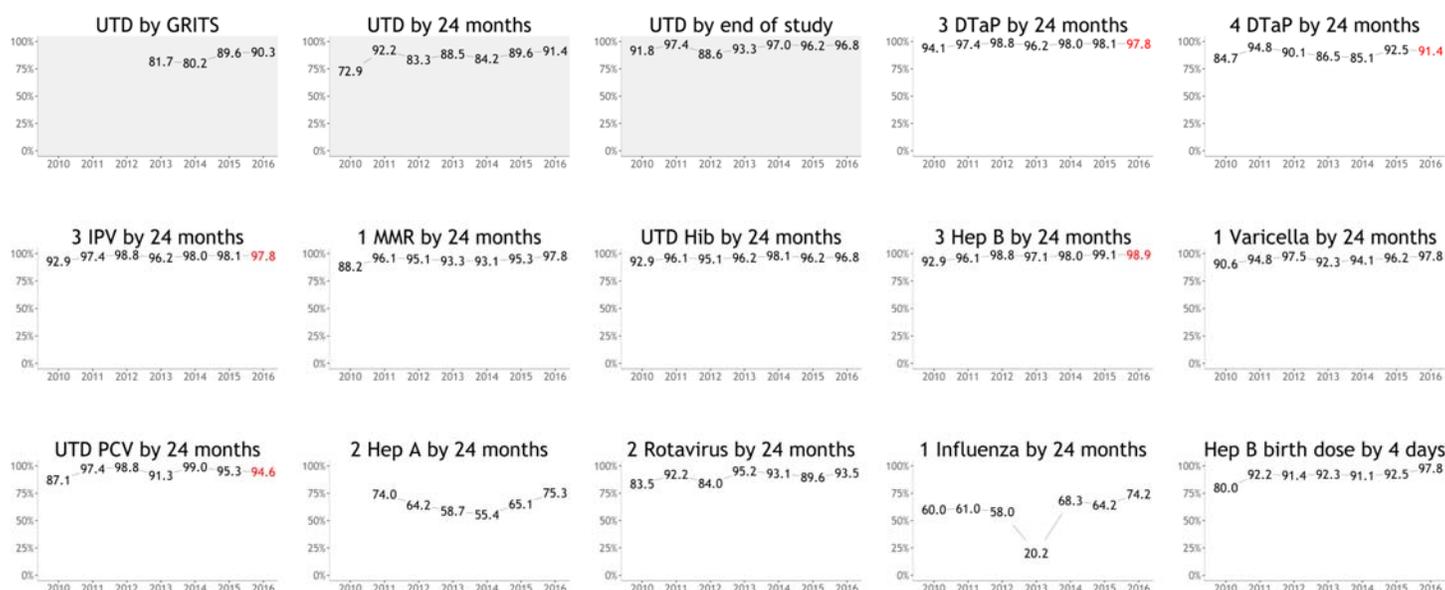
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 8-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 8-1, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 8-1 sample (and all District 8-1 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 8-1-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 8-1-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 8-1-C: District 8-1 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		8-1 Sample ‡ n = 93	All 2014 births ‡ N = 3,506	GRITS alone n = 93 (%)	24 months n = 93 (%)	End of study n = 93 (%)
Mother's race*	White	55 (59.1%)	2109 (60.2%)	96.4 ± 4.1	<b>96.4 ± 4.1</b>	98.2 ± 2.9
	Black or African-American	32 (34.4%)	1274 (36.3%)	78.1 ± 12.0	<b>81.2 ± 11.0</b>	93.8 ± 7.0
	Asian		38 (1.1%)			
	Multiracial	5 (5.4%)	64 (1.8%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	84 (90.3%)	3193 (91.1%)	90.5 ± 5.2	90.5 ± 5.2	96.4 ± 3.3
	Hispanic	9 (9.7%)	310 (8.8%)	88.9 ± 17.0	100.0 ± 0.0	100.0 ± 0.0
Mother's age*	<25 years old	35 (37.6%)	1533 (43.7%)	88.6 ± 8.7	88.6 ± 8.7	100.0 ± 0.0
	25 - 35 years old	47 (50.5%)	1692 (48.3%)	93.6 ± 5.8	93.6 ± 5.8	95.7 ± 4.8
	35+ years old	11 (11.8%)	281 (8.0%)	81.8 ± 19.0	90.9 ± 14.0	90.9 ± 14.0
Mother's education*	Some college or higher	39 (41.9%)	1664 (47.5%)	97.4 ± 4.1	97.4 ± 4.1	97.4 ± 4.1
	High School Graduate/GED	39 (41.9%)	1143 (32.6%)	84.6 ± 9.4	84.6 ± 9.4	94.9 ± 5.7
	9th - 11th grade	9 (9.7%)	561 (16.0%)	88.9 ± 17.0	88.9 ± 17.0	100.0 ± 0.0
	<9th grade	4 (4.3%)	113 (3.2%)	75.0 ± 35.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	50 (53.8%)	1690 (48.2%)	96.0 ± 4.5	<b>98.0 ± 3.2</b>	98.0 ± 3.2
	Unmarried	43 (46.2%)	1805 (51.5%)	83.7 ± 9.2	<b>83.7 ± 9.2</b>	95.3 ± 5.2
Child's WIC status	WIC	65 (69.9%)		89.2 ± 6.3	89.2 ± 6.3	96.9 ± 3.5
	Non-WIC	28 (30.1%)		92.9 ± 7.9	96.4 ± 5.7	96.4 ± 5.7
Number of provider(s) visited	One	64 (68.8%)		95.3 ± 4.3	95.3 ± 4.3	98.4 ± 2.5
	Two	16 (17.2%)		75.0 ± 18.0	81.2 ± 16.0	93.8 ± 9.8
	Three or more	12 (12.9%)		91.7 ± 13.0	91.7 ± 13.0	100.0 ± 0.0
Type of provider(s) visited	Private	82 (88.2%)		93.9 ± 4.3	95.1 ± 3.9	97.6 ± 2.8
	Public	1 (1.1%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Both	9 (9.7%)		66.7 ± 26.0	66.7 ± 26.0	100.0 ± 0.0

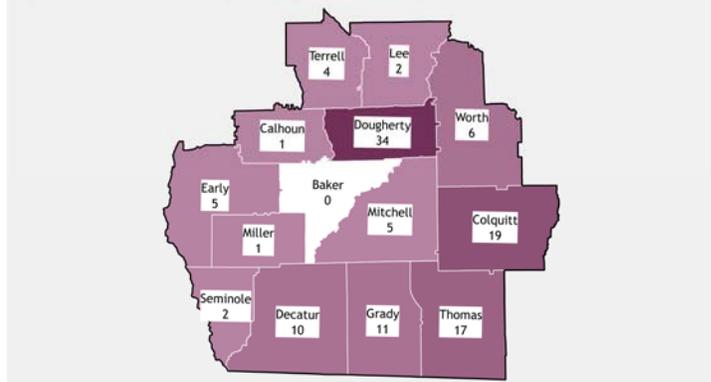
‡ Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery  
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 8-2

Figure 8-2-A: Location of District 8-2



Figure 8-2-B: Sampling per County, District 8-2, 2016



## Final Sample Determination

The original 2016 GIS sample for District 8-2 consisted of 117 children born in January of 2014 (Table 8-2-A). Of these, 5 children were determined to be ineligible for the study. Of those eligible, 3 children were unable to be located and were therefore excluded. The final sample size for District 8-2, which was used to calculate all rates, was 109. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 8-2, the UTD immunization rate by 24 months of age was 86.2%, which was lower than the 2015 rate (87.4%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 80.7%, lower than the 2015 rate (86.2%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 89.9%, lower than the 2015 rate (95.4%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 8-2-B and Figure 8-2-C). Rates that decreased in 2016 are shown as **red** in Table 8-2-B and Figure 8-2-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 8-2-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,026 vaccines doses administered to the District 8-2 cohort, 168 (8.3%) were administered by public health providers and 1,858 (91.7%) were administered by private providers.

Table 8-2-A: GIS Sampling Scheme, District 8-2, 2016

	2015	2016	State 2016
Original sample (n)	94	117	2742
Ineligible (n)	5	5	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	89	112	2527
Unable to locate <sup>†</sup> (n)	2	3	63
Final sample (n)	87	109	2464
Response rate (%)	97.8	97.3	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 8-2-B: Immunization Rates by Series and Vaccine Antigen, District 8-2, 2016

	2015 n = 87 (%)	2016 n = 109 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	86.2 ± 7.3	<b>80.7 ± 6.2</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	87.4 ± 7.0	<b>86.2 ± 5.4</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection <sup>†</sup>	95.4 ± 4.4	<b>89.9 ± 4.7</b>	91.0 ± 1.1
3 DTaP by 24 months	100.0 ± 0.0	<b>94.5 ± 3.6</b>	95.4 ± 0.8
4 DTaP by 24 months	87.4 ± 7.0	<b>86.2 ± 5.4</b>	84.3 ± 1.3
3 IPV by 24 months	100.0 ± 0.0	<b>94.5 ± 3.6</b>	94.5 ± 0.9
1 MMR by 24 months	94.3 ± 4.9	95.4 ± 3.3	93.1 ± 0.9
UTD Hib by 24 months	98.9 ± 2.3	<b>93.6 ± 3.8</b>	90.7 ± 1.1
3 Hep B by 24 months	100.0 ± 0.0	<b>98.2 ± 2.1</b>	95.0 ± 0.8
1 Varicella by 24 months	94.3 ± 4.9	95.4 ± 3.3	93.0 ± 1.0
UTD PCV by 24 months	93.1 ± 5.4	<b>91.7 ± 4.3</b>	91.4 ± 1.0
2 Hep A by 24 months	70.1 ± 9.7	<b>67.9 ± 7.3</b>	62.3 ± 1.8
2 Rotavirus by 24 months	<b>92.0 ± 5.7</b>	<b>78.0 ± 6.5</b>	85.3 ± 1.3
1+ Influenza by 24 months	73.6 ± 9.3	<b>60.6 ± 7.7</b>	58.8 ± 1.8
Hep B birth dose by 4 days	78.2 ± 8.7	88.1 ± 5.1	<b>83.6 ± 1.4</b>

<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 8-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 8-2, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 8-2 sample (and all District 8-2 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 8-2-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 8-2.

**Table 8-2-C: District 8-2 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		8-2 Sample † n = 109	All 2014 births † N = 4,519	GRITS alone n = 109 (%)	24 months n = 109 (%)	End of study n = 109 (%)
Mother's race*	White	56 (51.4%)	2150 (47.6%)	87.5 ± 7.2	91.1 ± 6.2	92.9 ± 5.6
	Black or African-American	52 (47.7%)	2250 (49.8%)	73.1 ± 10.0	80.8 ± 9.0	86.5 ± 7.8
	Asian		46 (1.0%)			
	Multiracial		54 (1.2%)			
Mother's ethnicity*	Non-Hispanic	98 (89.9%)	4135 (91.5%)	79.6 ± 6.7	85.7 ± 5.8	89.8 ± 5.0
	Hispanic	11 (10.1%)	381 (8.4%)	90.9 ± 14.0	90.9 ± 14.0	90.9 ± 14.0
Mother's age*	<25 years old	46 (42.2%)	2079 (46.0%)	76.1 ± 10.0	84.8 ± 8.7	91.3 ± 6.8
	25 - 35 years old	56 (51.4%)	2076 (45.9%)	83.9 ± 8.0	87.5 ± 7.2	89.3 ± 6.8
	35+ years old	7 (6.4%)	364 (8.1%)	85.7 ± 22.0	85.7 ± 22.0	85.7 ± 22.0
Mother's education*	Some college or higher	50 (45.9%)	1932 (42.8%)	86.0 ± 8.0	92.0 ± 6.3	94.0 ± 5.5
	High School Graduate/GED	38 (34.9%)	1616 (35.8%)	78.9 ± 11.0	86.8 ± 9.0	89.5 ± 8.2
	9th - 11th grade	11 (10.1%)	734 (16.2%)	63.6 ± 24.0	63.6 ± 24.0	72.7 ± 22.0
	<9th grade	8 (7.3%)	201 (4.4%)	87.5 ± 19.0	87.5 ± 19.0	87.5 ± 19.0
Marital status*	Married	47 (43.1%)	1822 (40.3%)	87.2 ± 8.0	89.4 ± 7.4	91.5 ± 6.7
	Unmarried	60 (55.0%)	2677 (59.2%)	76.7 ± 8.9	85.0 ± 7.6	90.0 ± 6.3
Child's WIC status	WIC	86 (78.9%)		77.9 ± 7.3	83.7 ± 6.5	88.4 ± 5.7
	Non-WIC	23 (21.1%)		91.3 ± 9.6	95.7 ± 7.0	95.7 ± 7.0
Number of provider(s) visited	One	54 (49.5%)		87.0 ± 7.5	88.9 ± 7.0	92.6 ± 5.8
	Two	39 (35.8%)		82.1 ± 10.0	87.2 ± 8.8	92.3 ± 7.0
	Three or more	12 (11.0%)		66.7 ± 22.0	83.3 ± 18.0	83.3 ± 18.0
Type of provider(s) visited	Private	81 (74.3%)		87.7 ± 6.0	91.4 ± 5.1	95.1 ± 3.9
	Public	1 (0.9%)		0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0
	Both	23 (21.1%)		69.6 ± 16.0	78.3 ± 14.0	82.6 ± 13.0

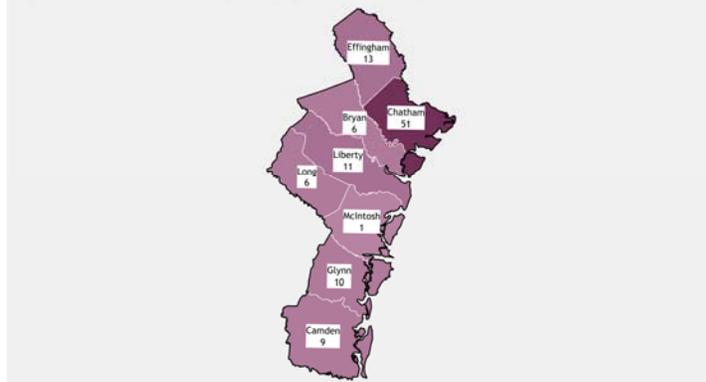
† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 9-1

Figure 9-1-A: Location of District 9-1



Figure 9-1-B: Sampling per County, District 9-1, 2016



## Final Sample Determination

The original 2016 GIS sample for District 9-1 consisted of 107 children born in January of 2014 (Table 9-1-A). Of these, 16 children were determined to be ineligible for the study. Of those eligible, 8 children were unable to be located and were therefore excluded. The final sample size for District 9-1, which was used to calculate all rates, was 83. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a smaller sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 9-1, the UTD immunization rate by 24 months of age was 73.5%, which was lower than the 2015 rate (90.2%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 68.7%, lower than the 2015 rate (88.4%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 81.9%, lower than the 2015 rate (95.5%), and lower than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 9-1-B and Figure 9-1-C). Rates that decreased in 2016 are shown as **red** in Table 9-1-B and Figure 9-1-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 9-1-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 1,428 vaccines doses administered to the District 9-1 cohort, 198 (13.9%) were administered by public health providers and 1,230 (86.1%) were administered by private providers.

Table 9-1-A: GIS Sampling Scheme, District 9-1, 2016

	2015	2016	State 2016
Original sample (n)	127	107	2742
Ineligible (n)	8	16	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	119	91	2527
Unable to locate <sup>†</sup> (n)	7	8	63
Final sample (n)	112	83	2464
Response rate (%)	94.1	91.2	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 9-1-B: Immunization Rates by Series and Vaccine Antigen, District 9-1, 2016

	2015 n = 112 (%)	2016 n = 83 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	<b>88.4 ± 6.0</b>	<b>68.7 ± 9.3</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	<b>90.2 ± 5.5</b>	<b>73.5 ± 8.9</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection†	<b>95.5 ± 3.8</b>	<b>81.9 ± 7.7</b>	<b>91.0 ± 1.1</b>
3 DTaP by 24 months	96.4 ± 3.5	<b>88.0 ± 6.5</b>	<b>95.4 ± 0.8</b>
4 DTaP by 24 months	<b>90.2 ± 5.5</b>	<b>74.7 ± 8.7</b>	84.3 ± 1.3
3 IPV by 24 months	<b>96.4 ± 3.5</b>	<b>85.5 ± 7.1</b>	<b>94.5 ± 0.9</b>
1 MMR by 24 months	93.8 ± 4.5	<b>88.0 ± 6.5</b>	93.1 ± 0.9
UTD Hib by 24 months	95.5 ± 3.8	<b>88.0 ± 6.5</b>	90.7 ± 1.1
3 Hep B by 24 months	<b>98.2 ± 2.5</b>	<b>88.0 ± 6.5</b>	95.0 ± 0.8
1 Varicella by 24 months	93.8 ± 4.5	<b>85.5 ± 7.1</b>	93.0 ± 1.0
UTD PCV by 24 months	93.8 ± 4.5	<b>83.1 ± 7.5</b>	91.4 ± 1.0
2 Hep A by 24 months	67.9 ± 8.7	<b>57.8 ± 9.9</b>	62.3 ± 1.8
2 Rotavirus by 24 months	85.7 ± 6.5	<b>73.5 ± 8.9</b>	<b>85.3 ± 1.3</b>
1+ Influenza by 24 months	70.5 ± 8.5	<b>55.4 ± 10.0</b>	58.8 ± 1.8
Hep B birth dose by 4 days	79.5 ± 7.5	<b>74.7 ± 8.7</b>	83.6 ± 1.4

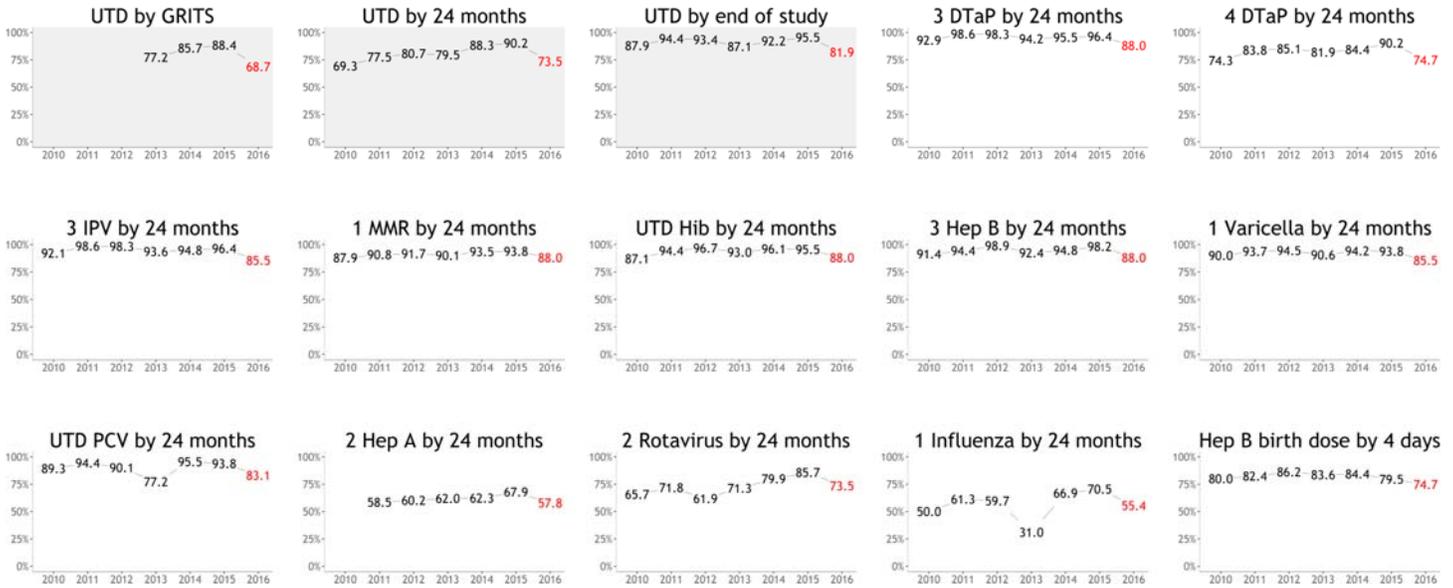
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

**Figure 9-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 9-1, 2010-2016**



**Demographic Findings**

The demographic breakdown of the District 9-1 sample (and all District 9-1 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 9-1-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found within the demographic subgroups in District 9-1.

**Table 9-1-C: District 9-1 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		9-1 Sample † n = 83	All 2014 births † N = 7,498	GRITS alone n = 83 (%)	24 months n = 83 (%)	End of study n = 83 (%)
Mother's race*	White	47 (56.6%)	4343 (57.9%)	59.6 ± 13.0	68.1 ± 12.0	76.6 ± 11.0
	Black or African-American	33 (39.8%)	2621 (35.0%)	84.8 ± 11.0	84.8 ± 11.0	90.9 ± 9.2
	Asian	1 (1.2%)	156 (2.1%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	2 (2.4%)	274 (3.7%)	0.0 ± 0.0	0.0 ± 0.0	50.0 ± 65.0
Mother's ethnicity*	Non-Hispanic	80 (96.4%)	6494 (86.6%)	67.5 ± 9.6	72.5 ± 9.1	81.2 ± 8.0
	Hispanic	3 (3.6%)	637 (8.5%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's age*	<25 years old	26 (31.3%)	2651 (35.4%)	61.5 ± 17.0	61.5 ± 17.0	76.9 ± 15.0
	25 - 35 years old	47 (56.6%)	4035 (53.8%)	74.5 ± 12.0	83.0 ± 10.0	87.2 ± 8.9
	35+ years old	10 (12.0%)	812 (10.8%)	60.0 ± 28.0	60.0 ± 28.0	70.0 ± 27.0
Mother's education*	Some college or higher	39 (47.0%)	4195 (55.9%)	66.7 ± 14.0	76.9 ± 12.0	84.6 ± 11.0
	High School Graduate/GED	32 (38.6%)	2211 (29.5%)	68.8 ± 15.0	68.8 ± 15.0	81.2 ± 13.0
	9th - 11th grade	6 (7.2%)	858 (11.4%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	<9th grade	3 (3.6%)	147 (2.0%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	46 (55.4%)	3997 (53.3%)	65.2 ± 13.0	73.9 ± 12.0	80.4 ± 11.0
	Unmarried	37 (44.6%)	3460 (46.1%)	73.0 ± 13.0	73.0 ± 13.0	83.8 ± 11.0
Child's WIC status	WIC	45 (54.2%)		75.6 ± 12.0	75.6 ± 12.0	84.4 ± 9.9
	Non-WIC	38 (45.8%)		60.5 ± 15.0	71.1 ± 13.0	78.9 ± 12.0
Number of provider(s) visited	One	34 (41.0%)		70.6 ± 14.0	76.5 ± 13.0	85.3 ± 11.0
	Two	22 (26.5%)		72.7 ± 17.0	81.8 ± 15.0	95.5 ± 8.1
	Three or more	19 (22.9%)		89.5 ± 13.0	89.5 ± 13.0	94.7 ± 9.4
Type of provider(s) visited	Private	51 (61.4%)		72.5 ± 11.0	80.4 ± 10.0	88.2 ± 8.3
	Public	5 (6.0%)		60.0 ± 40.0	60.0 ± 40.0	80.0 ± 33.0
	Both	19 (22.9%)		89.5 ± 13.0	89.5 ± 13.0	100.0 ± 0.0

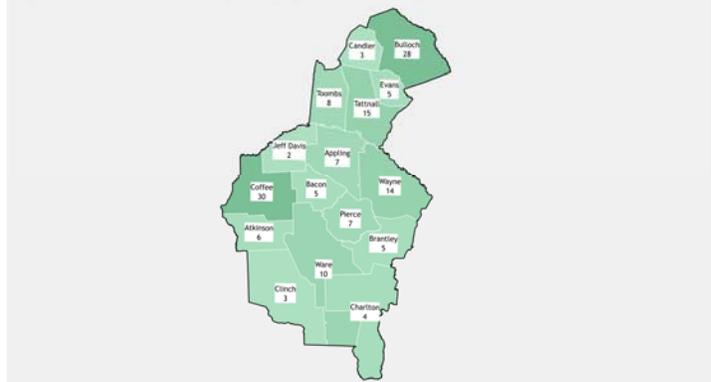
† Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery

# District 9-2

Figure 9-2-A: Location of District 9-2



Figure 9-2-B: Sampling per County, District 9-2, 2016



## Final Sample Determination

The original 2016 GIS sample for District 9-2 consisted of 152 children born in January of 2014 (Table 9-2-A). Of these, 12 children were determined to be ineligible for the study. Of those eligible, 4 children were unable to be located and were therefore excluded. The final sample size for District 9-2, which was used to calculate all rates, was 136. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a lower response rate was achieved in 2016.

## Immunization Rates

In District 9-2, the UTD immunization rate by 24 months of age was 77.2%, which was lower than the 2015 rate (85.1%) and lower than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 75.0%, lower than the 2015 rate (85.1%), and lower than the state rate (76.5%). The UTD immunization rate by end of data collection was 94.1%, lower than the 2015 rate (97.9%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 9-2-B and Figure 9-2-C). Rates that decreased in 2016 are shown as **red** in Table 9-2-B and Figure 9-2-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 9-2-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,449 vaccines doses administered to the District 9-2 cohort, 493 (20.1%) were administered by public health providers and 1,956 (79.9%) were administered by private providers.

Table 9-2-A: GIS Sampling Scheme, District 9-2, 2016

	2015	2016	State 2016
Original sample (n)	101	152	2742
Ineligible (n)	6	12	215
(Refused to participate) (n)	0	0	12
Eligible sample (n)	95	140	2527
Unable to locate <sup>†</sup> (n)	1	4	63
Final sample (n)	94	136	2464
Response rate (%)	98.9	97.1	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 9-2-B: Immunization Rates by Series and Vaccine Antigen, District 9-2, 2016

	2015 n = 94 (%)	2016 n = 136 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	85.1 ± 7.2	<b>75.0 ± 5.9</b>	76.5 ± 1.6
UTD immunization rate* by 24 months	85.1 ± 7.2	<b>77.2 ± 5.7</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection†	97.9 ± 2.9	<b>94.1 ± 3.2</b>	91.0 ± 1.1
3 DTaP by 24 months	97.9 ± 2.9	<b>97.8 ± 2.0</b>	95.4 ± 0.8
4 DTaP by 24 months	86.2 ± 7.0	<b>78.7 ± 5.5</b>	84.3 ± 1.3
3 IPV by 24 months	97.9 ± 2.9	<b>97.8 ± 2.0</b>	<b>94.5 ± 0.9</b>
1 MMR by 24 months	92.6 ± 5.3	93.4 ± 3.4	93.1 ± 0.9
UTD Hib by 24 months	94.7 ± 4.6	<b>89.7 ± 4.1</b>	90.7 ± 1.1
3 Hep B by 24 months	97.9 ± 2.9	<b>97.8 ± 2.0</b>	<b>95.0 ± 0.8</b>
1 Varicella by 24 months	94.7 ± 4.6	94.9 ± 3.0	93.0 ± 1.0
UTD PCV by 24 months	91.5 ± 5.7	<b>90.4 ± 4.0</b>	91.4 ± 1.0
2 Hep A by 24 months	63.8 ± 9.8	64.7 ± 6.5	62.3 ± 1.8
2 Rotavirus by 24 months	86.2 ± 7.0	87.5 ± 4.5	85.3 ± 1.3
1+ Influenza by 24 months	60.6 ± 9.9	<b>46.3 ± 6.8</b>	<b>58.8 ± 1.8</b>
Hep B birth dose by 4 days	87.2 ± 6.8	94.9 ± 3.0	<b>83.6 ± 1.4</b>

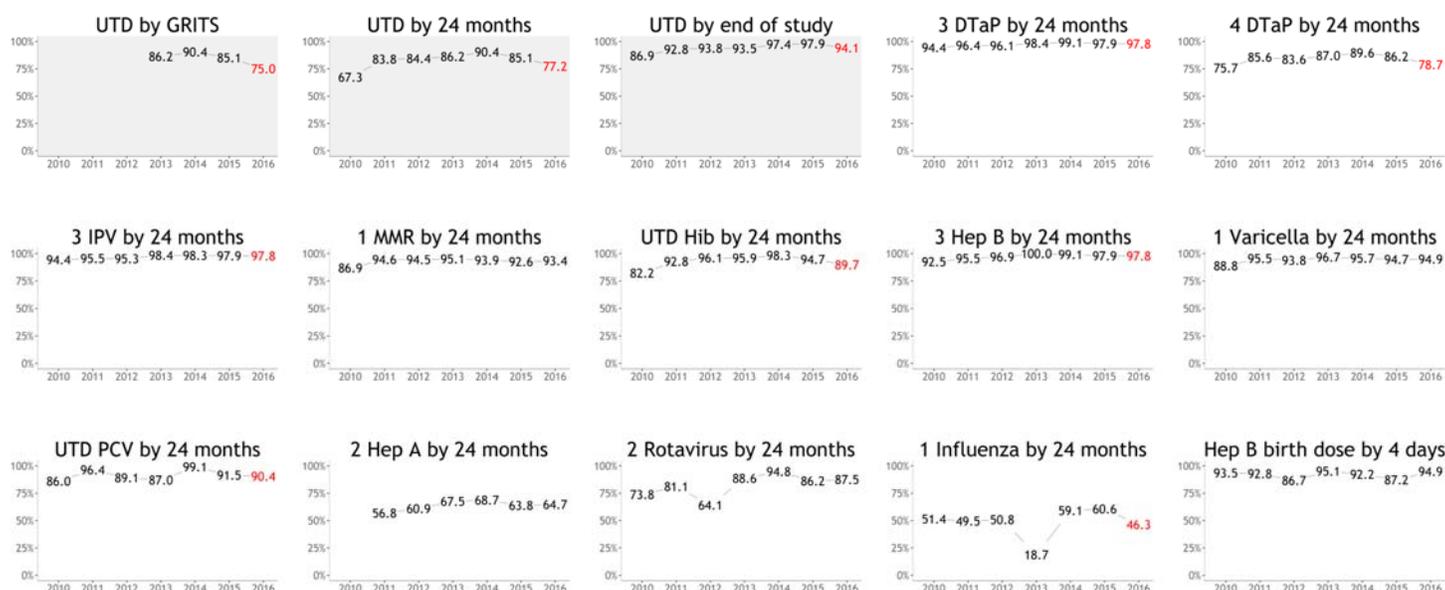
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate

**Figure 9-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 9-2, 2010-2016**



### Demographic Findings

The demographic breakdown of the District 9-2 sample (and all District 9-2 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 9-2-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 9-2-C. Although significance testing was not performed, these differences may be noteworthy.

**Table 9-2-C: District 9-2 Sample Demographics and Immunization Rates, 2016**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		9-2 Sample ‡ n = 136	All 2014 births ‡ N = 4,600	GRITS alone n = 136 (%)	24 months n = 136 (%)	End of study n = 136 (%)
Mother's race*	White	98 (72.1%)	3225 (70.1%)	78.6 ± 6.5	79.6 ± 6.4	91.8 ± 4.4
	Black or African-American	36 (26.5%)	1229 (26.7%)	63.9 ± 13.0	69.4 ± 12.0	100.0 ± 0.0
	Asian	1 (0.7%)	41 (0.9%)			
	Multiracial	1 (0.7%)	82 (1.8%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	124 (91.2%)	4035 (87.7%)	73.4 ± 6.3	75.8 ± 6.1	93.5 ± 3.5
	Hispanic	12 (8.8%)	520 (11.3%)	91.7 ± 13.0	91.7 ± 13.0	100.0 ± 0.0
Mother's age*	<25 years old	58 (42.6%)	2081 (45.2%)	72.4 ± 9.3	74.1 ± 9.1	94.8 ± 4.6
	25 - 35 years old	65 (47.8%)	2150 (46.7%)	73.8 ± 8.6	76.9 ± 8.3	92.3 ± 5.2
	35+ years old	13 (9.6%)	369 (8.0%)	92.3 ± 12.0	92.3 ± 12.0	100.0 ± 0.0
Mother's education*	Some college or higher	60 (44.1%)	1860 (40.4%)	80.0 ± 8.2	81.7 ± 7.9	91.7 ± 5.6
	High School Graduate/GED	54 (39.7%)	1617 (35.2%)	70.4 ± 9.8	74.1 ± 9.4	94.4 ± 4.9
	9th - 11th grade	17 (12.5%)	865 (18.8%)	76.5 ± 16.0	76.5 ± 16.0	100.0 ± 0.0
	<9th grade	4 (2.9%)	215 (4.7%)	75.0 ± 34.0	75.0 ± 34.0	100.0 ± 0.0
Marital status*	Married	66 (48.5%)	2188 (47.6%)	75.8 ± 8.3	77.3 ± 8.1	89.4 ± 6.0
	Unmarried	70 (51.5%)	2388 (51.9%)	74.3 ± 8.3	77.1 ± 7.9	98.6 ± 2.2
Child's WIC status	WIC	112 (82.4%)		72.3 ± 6.7	75.0 ± 6.5	94.6 ± 3.4
	Non-WIC	24 (17.6%)		87.5 ± 11.0	87.5 ± 11.0	91.7 ± 8.9
Number of provider(s) visited	One	54 (39.7%)		88.9 ± 6.8	<b>88.9 ± 6.8</b>	98.1 ± 2.9
	Two	56 (41.2%)		66.1 ± 10.0	<b>67.9 ± 9.9</b>	92.9 ± 5.4
	Three or more	21 (15.4%)		71.4 ± 16.0	76.2 ± 15.0	95.2 ± 7.3
Type of provider(s) visited	Private	74 (54.4%)		83.8 ± 6.8	83.8 ± 6.8	94.6 ± 4.2
	Public	3 (2.2%)		66.7 ± 43.0	66.7 ± 43.0	100.0 ± 0.0
	Both	54 (39.7%)		66.7 ± 10.0	70.4 ± 9.8	96.3 ± 4.1

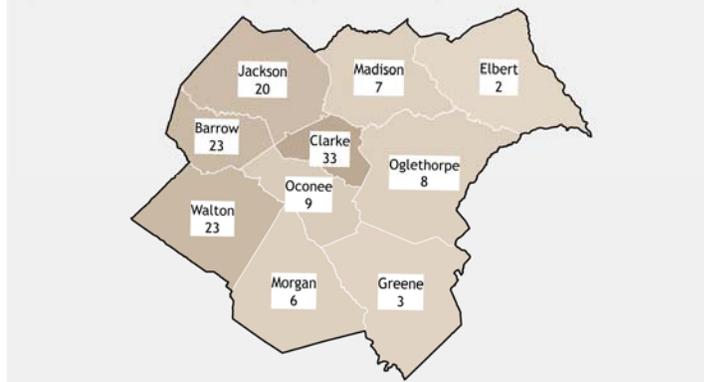
‡ Percentages may not add up to 100% because the information was missing for some participants  
\* Variable was collected at time of delivery  
*Italicized and bolded font indicates that confidence intervals don't overlap*

# District 10-0

Figure 10-0-A: Location of District 10-0



Figure 10-0-B: Sampling per County, District 10-0, 2016



## Final Sample Determination

The original 2016 GIS sample for District 10-0 consisted of 134 children born in January of 2014 (Table 10-0-A). Of these, 7 children were determined to be ineligible for the study. The final sample size for District 10-0, which was used to calculate all rates, was 127. The response rate was calculated by dividing the number of participants in the final sample by the eligible sample. Compared to the previous year, a larger sample was drawn and a higher response rate was achieved in 2016.

## Immunization Rates

In District 10-0, the UTD immunization rate by 24 months of age was 83.5%, which was lower than the 2015 rate (86.3%) and higher than the state rate (82.1%). The UTD immunization rate based on GRITS alone was 82.7%, higher than the 2015 rate (81.1%), and higher than the state rate (76.5%). The UTD immunization rate by end of data collection was 92.9%, higher than the 2015 rate (92.6%), and higher than the state rate (91.0%).

The vaccine-specific rates demonstrated little to no difference when compared to the previous year or to the state overall (Table 10-0-B and Figure 10-0-C). Rates that decreased in 2016 are shown as **red** in Table 10-0-B and Figure 10-0-C. Rates with confidence intervals that did not overlap with 2016 rates are *italicized and bolded* in Table 10-0-B. Although significance testing was not performed, these differences may be noteworthy.

## Immunization Administration

Of the 2,322 vaccines doses administered to the District 10-0 cohort, 67 (2.9%) were administered by public health providers and 2,255 (97.1%) were administered by private providers.

Table 10-0-A: GIS Sampling Scheme, District 10-0, 2016

	2015	2016	State 2016
Original sample (n)	110	134	2742
Ineligible (n)	12	7	215
(Refused to participate) (n)	3	2	12
Eligible sample (n)	98	127	2527
Unable to locate <sup>†</sup> (n)	3	0	63
Final sample (n)	95	127	2464
Response rate (%)	96.9	100	97.5

<sup>†</sup> Children were classified as "Unable to Locate" if every conceivable effort was made to locate and communicate with the child's guardian and the child's provider was either unknown or also unable to locate the guardian

Table 10-0-B: Immunization Rates by Series and Vaccine Antigen, District 10-0, 2016

	2015 n = 95 (%)	2016 n = 127 (%)	State n = 2,464 (%)
UTD immunization rate* based on GRITS alone	81.1 ± 7.9	82.7 ± 5.6	76.5 ± 1.6
UTD immunization rate* by 24 months	86.3 ± 6.9	<b>83.5 ± 5.5</b>	82.1 ± 1.4
UTD immunization rate* by end of data collection†	92.6 ± 5.3	92.9 ± 3.8	91.0 ± 1.1
3 DTaP by 24 months	97.9 ± 2.9	<b>96.1 ± 2.9</b>	95.4 ± 0.8
4 DTaP by 24 months	90.5 ± 5.9	<b>88.2 ± 4.8</b>	84.3 ± 1.3
3 IPV by 24 months	96.8 ± 3.5	<b>95.3 ± 3.2</b>	94.5 ± 0.9
1 MMR by 24 months	94.7 ± 4.5	97.6 ± 2.3	<b>93.1 ± 0.9</b>
UTD Hib by 24 months	96.8 ± 3.5	<b>90.6 ± 4.3</b>	90.7 ± 1.1
3 Hep B by 24 months	96.8 ± 3.5	<b>96.1 ± 2.9</b>	95.0 ± 0.8
1 Varicella by 24 months	92.6 ± 5.3	96.9 ± 2.6	<b>93.0 ± 1.0</b>
UTD PCV by 24 months	93.7 ± 4.9	93.7 ± 3.6	91.4 ± 1.0
2 Hep A by 24 months	60.0 ± 9.9	<b>57.5 ± 7.3</b>	62.3 ± 1.8
2 Rotavirus by 24 months	89.5 ± 6.2	<b>87.4 ± 4.9</b>	85.3 ± 1.3
1+ Influenza by 24 months	61.1 ± 9.9	<b>52.8 ± 7.4</b>	58.8 ± 1.8
Hep B birth dose by 4 days	84.2 ± 7.4	<b>81.1 ± 5.8</b>	83.6 ± 1.4

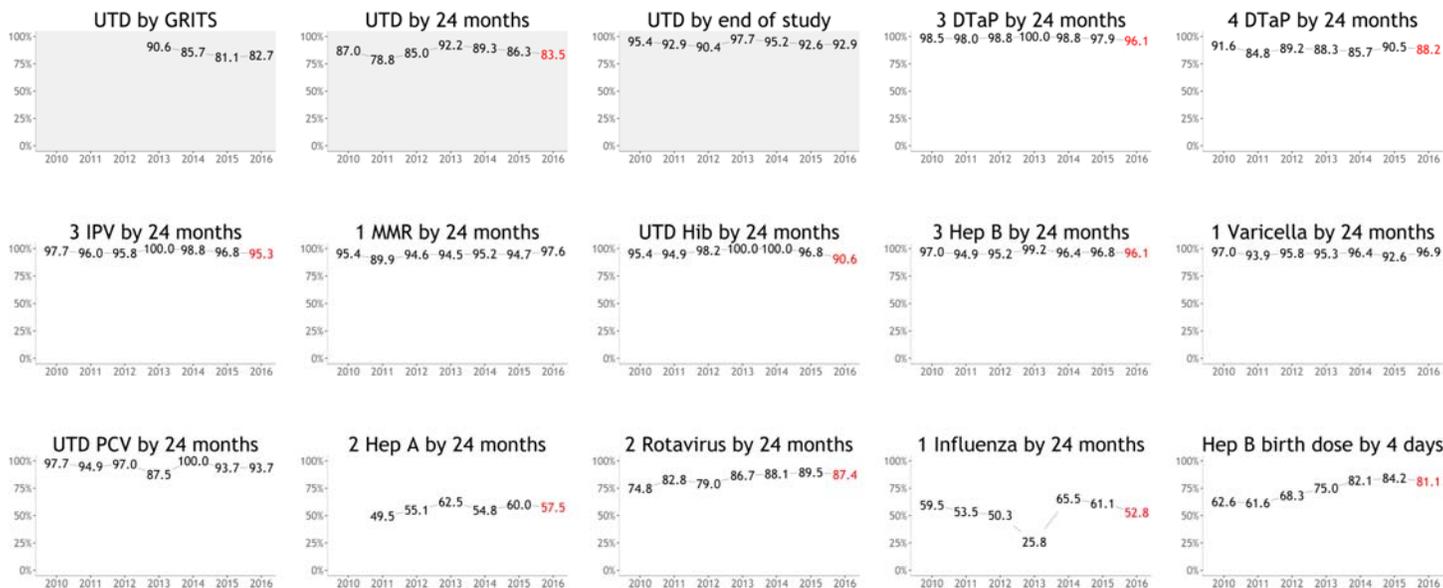
<sup>†</sup> Includes children who become UTD during the data collection period

\* Includes children up-to-date by ACIP-recommended catch-up schedule

Red font indicates a rate decrease since 2015

*Italicized and bolded font indicates that confidence intervals do not overlap with 2016 rate*

Figure 10-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 10-0, 2010-2016



### Demographic Findings

The demographic breakdown of the District 10-0 sample (and all District 10-0 births in 2014), alongside the UTD immunization rates by demographic groups are shown in Table 10-0-C. UTD by 24 month rates with confidence

intervals that do not overlap with other demographic subgroups are *italicized and bolded* in Table 10-0-C. Although significance testing was not performed, these differences may be noteworthy.

Table 10-0-C: District 10-0 Sample Demographics and Immunization Rates, 2016

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		10-0 Sample † n = 127	All 2014 births † N = 5,546	GRITS alone n = 127 (%)	24 months n = 127 (%)	End of study n = 127 (%)
Mother's race*	White	94 (74.0%)	4098 (73.9%)	81.9 ± 6.6	81.9 ± 6.6	92.6 ± 4.5
	Black or African-American	24 (18.9%)	1055 (19.0%)	87.5 ± 11.0	87.5 ± 11.0	95.8 ± 6.8
	Asian	3 (2.4%)	181 (3.3%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Multiracial	5 (3.9%)	157 (2.8%)	80.0 ± 30.0	100.0 ± 0.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	116 (91.3%)	4956 (89.4%)	83.6 ± 5.8	83.6 ± 5.8	94.0 ± 3.7
	Hispanic	11 (8.7%)	564 (10.2%)	72.7 ± 22.0	81.8 ± 19.0	81.8 ± 19.0
Mother's age*	<25 years old	34 (26.8%)	1807 (32.6%)	91.2 ± 8.1	91.2 ± 8.1	94.1 ± 6.8
	25 - 35 years old	71 (55.9%)	3055 (55.1%)	76.1 ± 8.5	<b>76.1 ± 8.5</b>	91.5 ± 5.5
	35+ years old	22 (17.3%)	684 (12.3%)	90.9 ± 10.0	<b>95.5 ± 7.4</b>	95.5 ± 7.4
Mother's education*	Some college or higher	73 (57.5%)	2942 (53.0%)	84.9 ± 7.0	86.3 ± 6.7	93.2 ± 4.9
	High School Graduate/GED	32 (25.2%)	1715 (30.9%)	78.1 ± 12.0	78.1 ± 12.0	87.5 ± 9.8
	9th - 11th grade	15 (11.8%)	641 (11.6%)	80.0 ± 17.0	80.0 ± 17.0	100.0 ± 0.0
	<9th grade	4 (3.1%)	168 (3.0%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	75 (59.1%)	3247 (58.5%)	85.3 ± 6.8	86.7 ± 6.6	94.7 ± 4.3
	Unmarried	52 (40.9%)	2272 (41.0%)	78.8 ± 9.5	78.8 ± 9.5	90.4 ± 6.8
Child's WIC status	WIC	66 (52.0%)		84.8 ± 7.4	84.8 ± 7.4	93.9 ± 4.9
	Non-WIC	61 (48.0%)		80.3 ± 8.5	82.0 ± 8.2	91.8 ± 5.9
Number of provider(s) visited	One	65 (51.2%)		83.1 ± 7.8	84.6 ± 7.5	93.8 ± 5.0
	Two	49 (38.6%)		87.8 ± 7.8	87.8 ± 7.8	95.9 ± 4.7
	Three or more	7 (5.5%)		71.4 ± 29.0	71.4 ± 29.0	100.0 ± 0.0
Type of provider(s) visited	Private	108 (85.0%)		85.2 ± 5.7	86.1 ± 5.6	94.4 ± 3.7
	Public	1 (0.8%)		0.0 ± 0.0	0.0 ± 0.0	100.0 ± 0.0
	Both	12 (9.4%)		83.3 ± 18.0	83.3 ± 18.0	100.0 ± 0.0

† Percentages may not add up to 100% because the information was missing for some participants

\* Variable was collected at time of delivery

*Italicized and bolded font indicates that confidence intervals don't overlap*



# Appendices

## Appendix A: Description of Demographic Variables

Variable	Missing or Unknown	Source	Additional Information
Maternal Race	1.5%	Electronic Birth Records	Additional coding not needed; standard measure in GA Electronic Birth Records.
Maternal Ethnicity	0%	Electronic Birth Records	Additional coding not needed; standard measure in GA Electronic Birth Records.
Maternal Age	0%	Electronic Birth Records	Calculated by subtracting mother's DOB and child's DOB. Maternal age break-down chosen based on HEDIS measures
Maternal Education	4.0%	Electronic Birth Records	Additional coding not needed; standard measure in GA Electronic Birth Records.
Maternal Marital Status	0.9%	Electronic Birth Records	Additional coding not needed; standard measure in GA Electronic Birth Records.
WIC Enrollment	N/A	WIC Program	Yearly cumulative lists of enrolled children were used to match children from the study sample to the enrollment list using names and dates of birth. The duration of enrollment was not calculated, so the children classified as "WIC enrolled" could have been enrolled for a short amount of time or for their entire lives.
Number of Providers	3.0%	GRITS	For each administered vaccine, the provider was researched. For records where the same provider administered all vaccines, the child was classified as having "One" provider. For two different providers, the child would have "Two" providers. The number of providers was limited to 3.
Provider Type	3.0%	GRITS	For each administered vaccine, the provider was assessed as either private, public or unknown. If a child only received immunizations from a public health department, they were classified as "Public". If a child received immunizations exclusively from (a) private provider/s, they were classified as "Private". If they received immunizations from a mixture, they were classified as "Both".

# Appendix B: Reasons for Incomplete Immunization History

**Appendix Table B: Frequency of Reasons for Incomplete Immunizations by End of Data Collection, Georgia, 2016**

- A. Religious exemption
- B. Medical exemption
- C. Temporary vaccine shortage
- D. Parent refuses to vaccinate\*
- E. Parent chooses to delay vaccination
- F. Physician chooses to delay vaccination
- G. Missed appointments/convenience issue
- H. Other

<i>District</i>	<i>Sample</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D*</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>Total</i>
1-1 Northwest (Rome)	169	1	0	0	1	2	2	9	2	17
1-2 North Georgia (Dalton)	159	0	0	0	6	1	0	4	1	12
2-0 North (Gainesville)	153	4	0	0	2	4	0	0	0	10
3-1 Cobb-Douglas	164	1	0	0	0	3	0	2	2	8
3-2 Fulton	159	1	0	0	1	1	0	6	3	12
3-3 Clayton	96	0	0	0	0	0	0	3	0	3
3-4 East Metro (Lawrenceville)	172	1	1	1	6	1	0	1	2	13
3-5 DeKalb	220	0	0	0	1	6	1	13	0	21
4-0 LaGrange	184	1	0	0	5	2	1	15	0	24
5-1 South Central (Dublin)	75	1	0	0	0	2	0	3	3	9
5-2 North Central (Macon)	123	0	0	0	3	2	0	12	0	17
6-0 East Central (Augusta)	140	0	0	0	0	0	0	9	2	11
7-0 West Central (Columbus)	102	0	0	0	0	1	0	3	0	4
8-1 South (Valdosta)	93	0	0	0	0	1	0	2	0	3
8-2 Southwest (Albany)	109	2	0	1	0	2	0	2	0	7
9-1 Coastal (Savannah)	83	4	0	1	2	3	0	4	1	15
9-2 Southeast (Waycross)	136	0	0	0	0	3	0	3	2	8
10 Northeast (Athens)	127	0	0	0	1	3	0	2	1	7
<b>Georgia</b>	<b>2464</b>	<b>16</b>	<b>1</b>	<b>3</b>	<b>28</b>	<b>37</b>	<b>4</b>	<b>93</b>	<b>19</b>	<b>201</b>

\*Child was classified as "Parent Refusal to Vaccinate" if a parent refused one or more vaccine series

## Appendix C: Immunization Coverage Measures

**Appendix Table C: District Immunization Coverage Rates, Georgia, 2016**

A. District response rate, 2016

B. UTD by 24 months, based on GRITS alone, 2016

C. UTD by 24 months, 2016

D. UTD by end of data collection, 2016

E. Five year Average UTD by 24 months, 2011 to 2016

F. Percent change in UTD by 24 months, 2015 to 2016

G. Percent change in UTD by end of data collection, 2015 to 2016

H. Percent change in UTD from 24 months to end of data collection, 2016

 Highest

<i>District</i>	<i>A</i> (%)	<i>B</i> (%)	<i>C</i> (%)	<i>D</i> (%)	<i>E</i> (%)	<i>F</i> (%)	<i>G</i> (%)	<i>H</i> (%)
1-1 Northwest (Rome)	98.8	76.9	82.2	89.9	85.6	1.1	-1.7	7.7
1-2 North Georgia (Dalton)	99.4	78.0	80.5	91.2	82.4	5.1	1.4	10.7
2-0 North (Gainesville)	99.4	78.4	85.6	93.5	84.1	6.9	4.2	7.9
3-1 Cobb-Douglas	97.6	78.7	85.4	95.1	84.5	3.7	4.8	9.7
3-2 Fulton	98.1	81.1	86.2	92.5	84.1	1.9	1.8	6.3
3-3 Clayton	86.5	68.8	78.1	92.7	80.1	-9.1	-4.1	14.6
3-4 East Metro (Lawrenceville)	98.3	76.2	82.6	91.9	83.3	-0.6	1.6	9.3
3-5 DeKalb	97.8	69.5	77.3	89.1	84.5	3.5	9.1	11.8
4-0 LaGrange	97.4	76.6	81.0	86.4	83.3	2.8	0.5	5.4
5-1 South Central (Dublin)	98.7	73.3	74.7	86.7	79.6	3.9	-5.0	12.0
5-2 North Central (Macon)	96.1	72.4	81.3	86.2	87.0	-5.4	-7.8	4.9
6-0 East Central (Augusta)	97.9	75.7	79.3	92.1	85.1	-5.9	-3.4	12.8
7-0 West Central (Columbus)	100.0	79.4	89.2	96.1	85.0	3.9	0.8	6.9
8-1 South (Valdosta)	100.0	90.3	91.4	96.8	88.2	1.8	0.6	5.4
8-2 Southwest (Albany)	97.3	80.7	86.2	89.9	86.7	-1.2	-5.5	3.7
9-1 Coastal (Savannah)	91.2	68.7	73.5	81.9	81.6	-16.7	-13.6	8.4
9-2 Southeast (Waycross)	97.1	75.0	77.2	94.1	84.5	-7.9	-3.8	16.9
10 Northeast (Athens)	100.0	82.7	83.5	92.9	85.8	-2.8	0.3	9.4
<b>Georgia</b>	<b>97.5</b>	<b>76.5</b>	<b>82.1</b>	<b>91.0</b>	<b>83.2</b>	<b>-0.6</b>	<b>-0.8</b>	<b>8.9</b>

## Appendix D: Vaccine Antigen-Specific Rates

Appendix Table D: District Vaccine Antigen-Specific Immunization Rates, Georgia, 2016

Highest Rate by 24 months

<i>District</i>	<i>4 DTaP (%)</i>	<i>3+ Polio (%)</i>	<i>1 MMR (%)</i>	<i>UTD Hib (%)</i>	<i>3 HepB (%)</i>	<i>1 Varic. (%)</i>	<i>UTD PCV (%)</i>	<i>2 HepA (%)</i>	<i>1+ Flu (%)</i>	<i>HepB Birth (%)</i>
1-1 Northwest (Rome)	82.2	94.1	94.1	86.4	95.3	93.5	88.8	54.4	47.3	84.6
1-2 North Georgia (Dalton)	84.9	93.7	89.9	88.7	93.1	91.2	88.1	62.3	66.0	79.9
2-0 North (Gainesville)	88.9	96.7	90.8	94.1	93.5	90.8	93.5	62.7	56.9	74.5
3-1 Cobb-Douglas	87.8	94.5	97.6	95.1	93.9	96.3	96.3	71.3	66.5	73.8
3-2 Fulton	86.2	95.0	95.6	92.5	95.0	95.6	93.7	67.9	69.2	83.0
3-3 Clayton	79.2	96.9	91.7	86.5	95.8	93.8	92.7	58.3	49.0	89.6
3-4 East Metro (Lawrenceville)	86.0	93.6	90.7	90.7	93.6	90.7	90.7	55.2	59.9	82.0
3-5 DeKalb	81.8	95.0	91.8	88.6	96.4	91.4	90.5	60.9	62.7	85.9
4-0 LaGrange	84.2	94.0	93.5	90.8	95.1	92.4	92.4	60.9	48.9	85.3
5-1 South Central (Dublin)	74.7	93.3	90.7	80.0	97.3	90.7	85.3	54.7	46.7	96.0
5-2 North Central (Macon)	83.7	95.9	91.9	90.2	94.3	91.9	90.2	65.9	52.8	92.7
6-0 East Central (Augusta)	80.7	95.7	90.7	86.4	99.3	93.6	87.9	54.3	65.0	82.9
7-0 West Central (Columbus)	90.2	96.1	96.1	95.1	96.1	96.1	96.1	70.6	52.0	91.2
8-1 South (Valdosta)	91.4	97.8	97.8	96.8	98.9	97.8	94.6	75.3	74.2	97.8
8-2 Southwest (Albany)	86.2	94.5	95.4	93.6	98.2	95.4	91.7	67.9	60.6	88.1
9-1 Coastal (Savannah)	74.7	85.5	88.0	88.0	88.0	85.5	83.1	57.8	55.4	74.7
9-2 Southeast (Waycross)	78.7	97.8	93.4	89.7	97.8	94.9	90.4	64.7	46.3	94.9
10 Northeast (Athens)	88.2	95.3	97.6	90.6	96.1	96.9	93.7	57.5	52.8	81.1
<b>Georgia</b>	<b>84.3</b>	<b>94.5</b>	<b>93.1</b>	<b>90.7</b>	<b>95.0</b>	<b>93.0</b>	<b>91.4</b>	<b>62.3</b>	<b>58.8</b>	<b>83.6</b>

# Additional Resources

For more information about the Georgia Department of Public Health Immunization Program, please visit the following website:

<http://dph.georgia.gov/immunization-section>

For past Georgia Immunization Study Final Reports, please visit the following website:

<http://dph.georgia.gov/immunization-publications>

For more information about the Georgia Department of Public Health Acute Disease Epidemiology Unit, please visit the following website:

<http://dph.georgia.gov/acute-disease-epidemiology>

To access current vaccine schedules, vaccine information sheets and other immunization materials, please visit the Immunization Action Coalition website: <http://www.immunize.org>

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