

# GEORGIA IMMUNIZATION STUDY 2017

Immunization Program / Acute Disease Epidemiology Section



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# Executive Summary

The 2017 Georgia Immunization Study (GIS) was conducted by the Georgia Department of Public Health Epidemiology Program, Georgia Immunization Program, and Georgia's 18 District Health Departments. 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 2017 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 2017<sup>1</sup>.

Each child's immunization record was reviewed to determine if it was up-to-date. 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 2017, the Georgia statewide up-to-date immunization rate by 24 months was 83.6 percent, up from 82.1 percent in 2016 ( Table 1, pg. 12).**

There was considerable variation by district in the percent of children found to be UTD by 24 months, ranging from 77.0 percent in District 3-5 to 91.1 percent in District 8-1. Caution should be taken when interpreting immunization rates for a district with a low response rate because children who are excluded from the study due to being unable-to-locate could also be the least UTD. The greatest UTD by 24 months improvement was observed in District 6-0, which had a 11.7 percentage point increase from 2016 to 2017 (Appendix Table C, pg. iii).

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 86.8 percent in District 1-1 to 96.9 percent in District 6-0. Efforts to bring children up-to-date resulted in an overall 8.7 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 indicates 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 5-1, where up-to-date immunization rates increased by 14.9 percentage points by the end of the data collection period (Appendix Table C, pg. iii). 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 77.9 percent, 1.4 percentage points higher than 2016 and 5.7 percentage points below the UTD by 24 months rate for 2017, indicating that GRITS is well utilized among Georgia 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 2017 study sample, 86.5 percent received their first dose of hepatitis B vaccine at birth, an increase from 83.6 percent in 2016. In addition, the percentage of children who received the entire 3-dose hepatitis B series by 24 months of age increased from 95.0 percent in 2016 to 95.9 percent in 2017 (Table 1, pg. 12).

The percentage of Georgia children who received the fourth dose of DTaP by 24 months of age increased by 1.3 percentage points from 2016 to 2017. This rate continues

1. Kroger AT, Duchin J, Vázquez M. General Best Practice Guidelines for Immunization. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP). <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html>. Accessed on 12/22/2017

to significantly lag behind the percentage of children who received the third dose by 24 months of age. In fact, 95.9 percent of children received three doses of DTaP by 24 months of age while only 85.6 percent received their fourth dose in 2017 (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 (52.7%) 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 2017 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 2017 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

Abbreviation	Definition
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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## 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, 2017 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 2017<sup>1</sup>.

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 parents and healthcare providers, 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 entire sample and the district-specific samples. The UTD immunization rates were also calculated for demographic subgroups within these samples.

### Target Population and sample selection

A random sample of 3,062 children born in January of 2015 was selected to represent all children born in Georgia in 2015. The sample was stratified by health district in order to generate district-level estimates. The sample size per district depended on the number of children born in that district and the district-specific response and UTD by 24 months immunization rate from the previous year. Sample sizes were calculated in order to satisfy margins of error of  $\pm 5\%$  for the 24 month UTD rates.

### Data Collection

#### *Passive data collection*

Data pertaining to the GIS sample was requested from: electronic birth records supplied by the Office of Health Indicators for Planning (OHIP), the Georgia Women, Infants, and Children Supplemental Nutrition Program (WIC) and GRITS.

Information from electronic birth records was used for sample selection and as a source of demographic data. The type of information obtained on each child included:

- Child's first, middle and last name
- Child's gender and date of birth
- Mother's residential county
- Mother's first, middle and last name
- Mother's race, ethnicity, level of education, marital status and age at delivery

The WIC enrollment variable was determined for each child by matching each child's name and date of birth with WIC enrollment data. Children enrolled in WIC for any amount of time during the first 24 months of life were designated as "enrolled in WIC".

Information on provider type, number of providers and source of payment was obtained from GRITS. Based on this information, the number of and type of provider(s) visited, and Medicaid eligibility was determined. Vaccinations given before 28 days of age were typically administered in hospital; they were not included in provider type calculations.

The "Provider Type" variable was determined based on the location where each individual vaccine was administered. 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 clinics, the child was classified as "Public Sector Only." If a child received vaccines in both private provider offices *and* public clinics, the child was classified as "Both private and public sector."

## Active data collection

An electronic web-based data collection system named “TWOY” was used to collect information for each child in the sample. The sampling frame, determined from birth records, was imported into TWOY in order to request immunization histories from GRITS. The TWOY system follows the recommended schedule of childhood immunizations jointly approved by the ACIP, the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP) to determine complete vaccine histories. 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.

An initial immunization history check was performed by TWOY to determine the UTD status of 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. Data collectors used the following protocol:

### Step 1: Search for immunization records

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: Contact the parent(s) and/or guardian(s).

Data collectors used contact information from the birth certificate or any updated 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.

### Step 3: Contact 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 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

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 date of birth 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. UTD immunization rates for demographic groups were assessed at both the state and district levels.

Since the sampling frame is stratified by district, not every child has the same probability of being selected for the sample. To account for this, sampling weights were calculated based on the total number of births in each district and were applied when calculating rate estimates.

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,  $83.6 \pm 1.3$  represents the confidence interval (82.3, 84.9) for the statewide UTD by 24 months estimate of 83.6%.

Significance testing for differences in rates was performed using R (*Epi* 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) Since the study sample is randomly selected from children born in Georgia during January 2015, 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=1572)
  - Black or African American (n=945)
  - Asian (n=96)
  - Other (n=71)



## State-Level Immunization Study Staff, 2017 Georgia Immunization Study

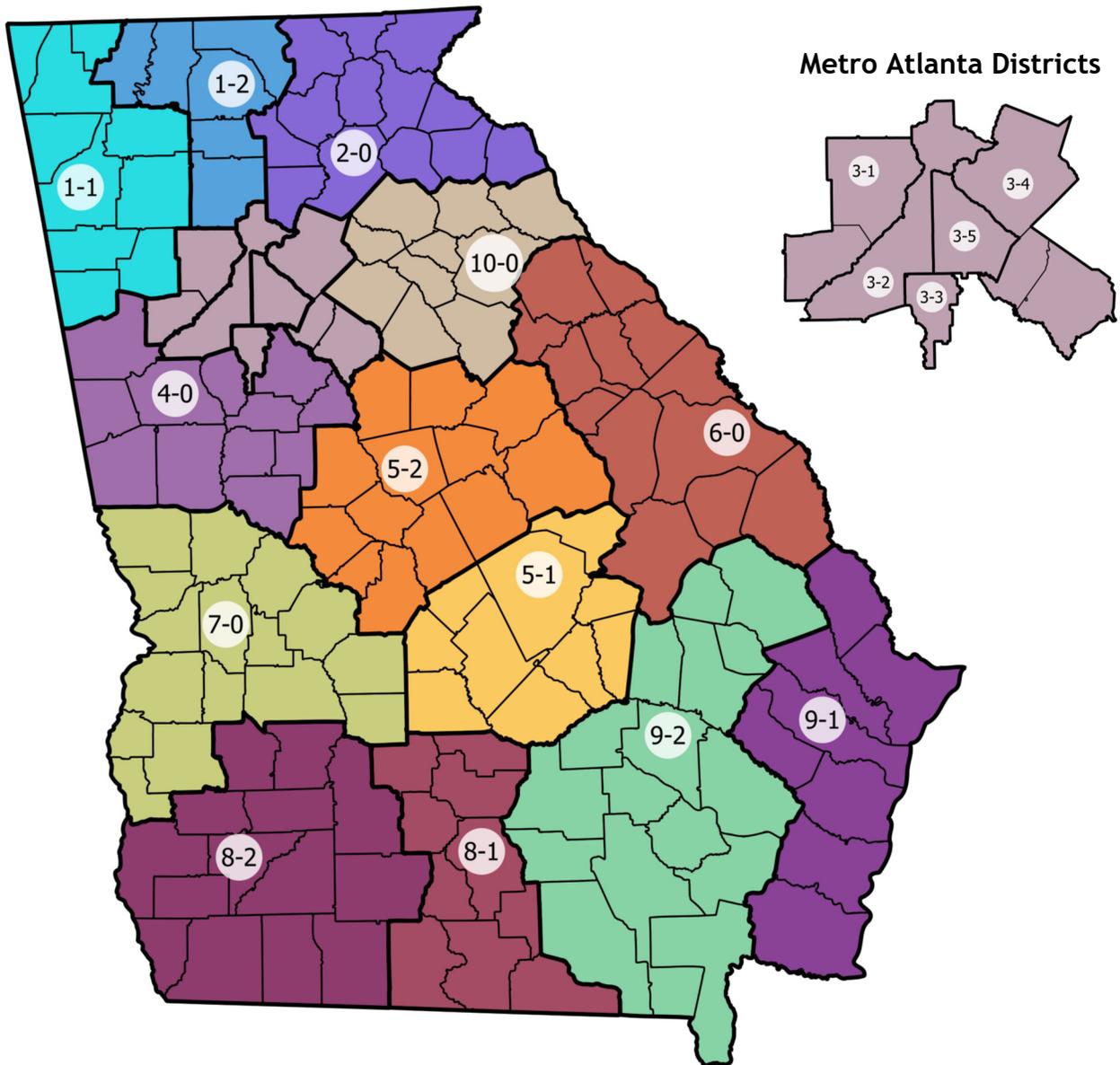
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Primary Editor

Figure 1: Georgia health districts



## 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 in Table 1 along with the accompanying margin of error. Rates that decreased are shown in red in Table 1 and Figure 2. Significant differences ( $p < 0.05$ ) between the 2017 and 2016 rates are *italicized and bolded* in Table 1.

Statewide, the UTD immunization rate by 24 months of age was 83.6%, which was higher than the 2016 rate (82.1%) (Table 1). The UTD immunization rate based on GRITS alone was 77.9%, which was higher than the 2016 rate (76.5%). The UTD immunization rate by end of data collection was 92.3%, which was higher than the 2016 rate (91.0%).

Most vaccine specific rates changed minimally from the previous year. The rates for Rotavirus and Hep B birth dose were the only vaccinations where a significant difference was observed.

The UTD immunization rates and rates by individual antigen from 2010 to 2017 are shown in Figure 2.

## Immunization Administration

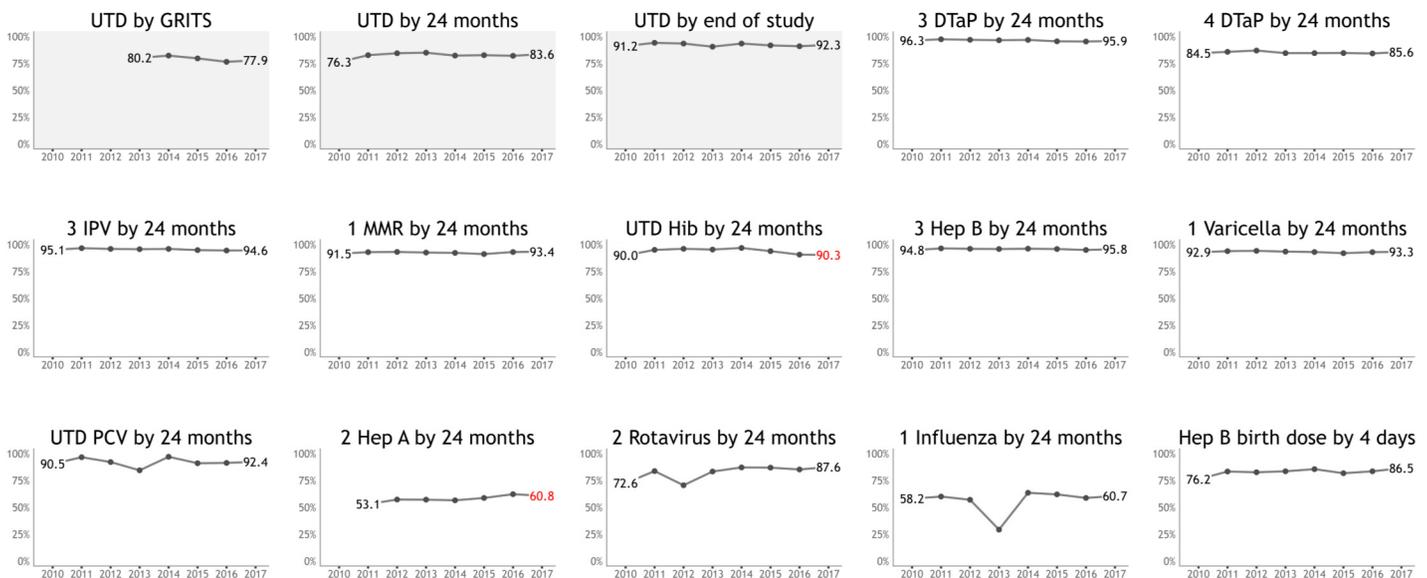
Statewide, 49,996 vaccine doses administered to the study cohort; 2,239 (4.5%) were administered by public health providers and 47,757 (95.5%) were administered by private providers.

**Table 1: Immunization Rates by Series and Vaccine Antigen, Georgia, 2017**

	2016 n = 2,464 (%)	2017 n = 2,684 (%)
UTD immunization rate based on GRITS alone*	76.5 ± 1.6	77.9 ± 1.4
UTD immunization rate by 24 months*	82.1 ± 1.4	83.6 ± 1.3
UTD immunization rate by end of data collection*†	91.0 ± 1.1	92.3 ± 0.9
3 DTaP by 24 months	95.4 ± 0.8	95.9 ± 0.7
4 DTaP by 24 months	84.3 ± 1.3	85.6 ± 1.2
3 IPV by 24 months	94.5 ± 0.9	94.6 ± 0.8
1 MMR by 24 months	93.1 ± 0.9	93.4 ± 0.8
UTD Hib by 24 months*	90.7 ± 1.1	<b>90.3 ± 1.0</b>
3 Hep B by 24 months	95.0 ± 0.8	95.8 ± 0.7
1 Varicella by 24 months	93.0 ± 1.0	93.3 ± 0.8
UTD PCV by 24 months*	91.4 ± 1.0	92.4 ± 0.9
2 Hep A by 24 months	62.3 ± 1.8	<b>60.8 ± 1.7</b>
2 Rotavirus by 24 months	<b>85.3 ± 1.3</b>	87.6 ± 1.1
1+ Influenza by 24 months	58.8 ± 1.8	60.7 ± 1.7
Hep B birth dose by 4 days	<b>83.6 ± 1.4</b>	86.5 ± 1.2

† 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 2016  
 Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 2: Immunization Rates (%) by Series and Vaccine Antigen, Georgia, 2010-2017**



## Final Sample Determination

The original 2017 GIS sample consisted of 3,062 children born in January of 2015 (Table 2). Of these, 209 children were determined to be ineligible for the study. Of those eligible, 169 children were unable to be located and were therefore excluded. The final sample size, which was used to calculate all rates, was 2,684. 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 2017.

## Demographic Findings

The demographic breakdown of the GIS sample (and all Georgia 2015 births), alongside the UTD immunization rates by demographic groups are displayed in Table 3. Significant differences ( $p < 0.05$ ) in UTD by 24 month rates between demographic subgroups are *italicized and bolded*. Brackets are used to indicate significantly different results between subgroups. The results suggest that differences in UTD by 24 month rates were found for:

- Children born to Black mothers vs children born to White and Asian mothers

**Table 2: GIS Sampling Scheme, Georgia, 2017**

	2016	2017
Original sample (n)	2742	3062
Ineligible (n)	215	209
(Refused to participate) (n)	12	16
Eligible sample (n)	2527	2853
Unable to locate <sup>†</sup> (n)	63	169
Final sample (n)	2464	2684
Response rate (%)	97.5	94.1

<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 mothers who gave birth at age < 25 vs children born to mothers who gave birth after 25
- Children born to mothers at different education levels
  - Some College vs HS/GED and 9-11th grade
  - Less than 9th vs HS/GED and 9-11th grade
- Children born to married vs unmarried mothers
- Children who were enrolled in WIC vs not enrolled
- Children who only visited one provider vs 2 or more
- Children who exclusively visited a private provider instead of a public or a mixture of provider types

**Table 3: Sample Demographics and Immunization Rates, Georgia, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		GIS Sample ‡ n = 2,684	All 2015 births ‡ N = 127,266	GRITS alone n = 2,684 (%)	24 months n = 2,684 (%)	End of study n = 2,684 (%)
Mother's race*	White	1572 (58.6%)	72922 (57.3%)	78.9 ± 1.8	<b>85.3 ± 1.6</b>	92.9 ± 1.1
	Black	945 (35.2%)	43859 (34.5%)	74.8 ± 2.6	<b>79.9 ± 2.4</b>	90.0 ± 1.8
	Asian	96 (3.6%)	5639 (4.4%)	86.6 ± 6.6	<b>90.4 ± 5.6</b>	98.9 ± 1.2
	Other	71 (2.6%)	4846 (3.8%)	84.0 ± 7.5	<b>85.9 ± 7.2</b>	97.1 ± 3.7
Mother's ethnicity*	non-Hispanic	2329 (86.8%)	108234 (85.0%)	77.6 ± 1.5	<b>83.2 ± 1.4</b>	91.7 ± 1.0
	Hispanic	355 (13.2%)	17358 (13.6%)	79.7 ± 3.9	<b>86.5 ± 3.3</b>	96.1 ± 1.9
Mother's age*	<25 years old	978 (36.4%)	39268 (30.9%)	75.5 ± 2.5	<b>80.6 ± 2.3</b>	90.0 ± 1.7
	25 - 35 years old	1345 (50.1%)	68662 (54.0%)	78.7 ± 2.0	<b>85.0 ± 1.7</b>	93.5 ± 1.2
	35+ years old	361 (13.5%)	19336 (15.2%)	80.9 ± 3.7	<b>85.9 ± 3.3</b>	93.6 ± 2.2
Mother's education*	Some college or higher	1344 (50.1%)	69346 (54.5%)	81.0 ± 1.9	<b>86.7 ± 1.7</b>	93.7 ± 1.2
	High School Graduate/GED	855 (31.9%)	36474 (28.7%)	75.5 ± 2.6	<b>81.3 ± 2.4</b>	90.2 ± 1.8
	9th - 11th grade	353 (13.2%)	14416 (11.3%)	70.8 ± 4.4	<b>76.5 ± 4.1</b>	89.5 ± 3.0
	<9th grade	91 (3.4%)	5082 (4.0%)	85.3 ± 6.8	<b>91.7 ± 5.4</b>	99.1 ± 1.4
Marital status*	Married	1376 (51.3%)	69122 (54.3%)	82.4 ± 1.9	<b>87.4 ± 1.6</b>	94.2 ± 1.1
	Unmarried	1307 (48.7%)	58043 (45.6%)	73.1 ± 2.2	<b>79.5 ± 2.0</b>	90.2 ± 1.5
Child's WIC status	WIC	1655 (61.7%)		76.2 ± 1.9	<b>81.4 ± 1.7</b>	91.8 ± 1.2
	non-WIC	1029 (38.3%)		80.5 ± 2.2	<b>87.0 ± 1.9</b>	93.0 ± 1.4
Number of provider(s) visited	One	2080 (77.5%)		80.9 ± 1.6	<b>86.2 ± 1.4</b>	93.5 ± 1.0
	Two	532 (19.8%)		73.8 ± 3.4	<b>80.6 ± 3.0</b>	94.0 ± 1.8
	Three or more	29 (1.1%)		49.7 ± 17.0	<b>65.5 ± 16.0</b>	95.0 ± 8.7
Type of provider(s) visited	Private	2311 (86.1%)		81.4 ± 1.5	<b>86.9 ± 1.3</b>	94.2 ± 0.9
	Public	50 (1.9%)		66.5 ± 12.0	<b>75.0 ± 11.0</b>	82.9 ± 9.1
	Both	280 (10.4%)		61.1 ± 5.2	<b>68.5 ± 4.9</b>	91.0 ± 3.0

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

\* Variable was collected at time of delivery

**Bolded and italicized indicate a significant difference**

## 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, 2016). The second year of life was defined as starting on the month after the first birthday (February 1, 2016) until the second birthday.

The UTD rate by 24 months (52.7%) and by end of data collection (76.9%) 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 439 children were identified as not UTD at 24 months of age. Of these, 320 (73%) had immunizations covered by Medicaid during their first year of life. Of those, 151 (47%) remained on Medicaid during the second year of life and 169 (53%) 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.

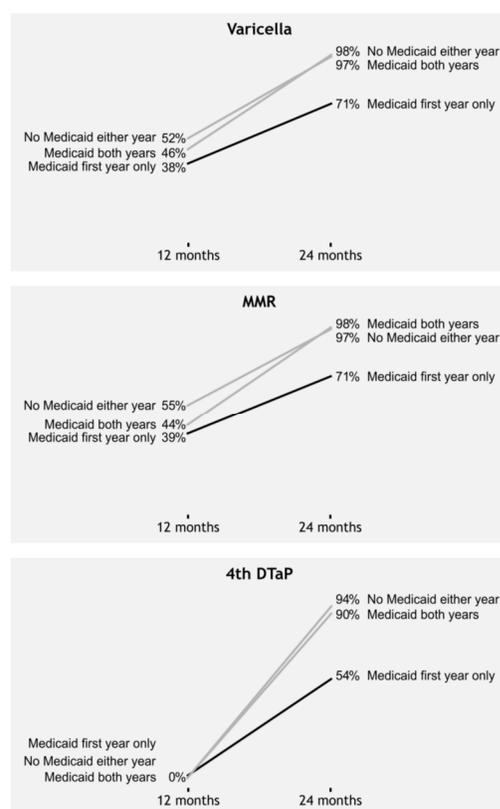
**Table 4: UTD by Medicaid Status, Georgia, 2017**

Medicaid Status	n (%)	UTD by 24 months	UTD by end of study
Medicaid both years	1420 (52.9)	88.4%	96.2%
Medicaid 1st year only	342 (12.7)	52.7%	76.9%
Medicaid 2nd year only	53 (2.0)	84.2%	90.6%
No Medicaid either year	829 (30.9)	91.3%	96.0%
Missing information	40 (1.5)		
State	2684 (100)	83.6%	92.3%

**Table 5: UTD by 12 and 24 months by Vaccine Antigen and Medicaid Status, Georgia, 2017**

	Medicaid Status	n	Varicella	MMR	4th DTaP
UTD at 12 months	Medicaid both years	1420	45.9%	43.9%	0.2%
	Medicaid 1st year only	342	38.5%	39.2%	0.7%
	No Medicaid either year	829	52.2%	55.3%	0.2%
UTD at 24 months	Medicaid both years	1420	98.4%	98.5%	90.3%
	Medicaid 1st year only	342	71.4%	71.4%	53.8%
	No Medicaid either year	829	97.1%	97.2%	93.7%

**Figure 3: UTD by 12 and 24 months by Vaccine Antigen and Medicaid Status, Georgia, 2017**



**Table 6: Reason for lapse in Medicaid status during second year of life among those not UTD by 24 months, Georgia, 2017**

Reason	n (%)
Eligible - but did not recertify	10 (6)
Not Eligible - currently not insured	2 (1)
Not Eligible - insured elsewhere	6 (4)
Unknown - contact with uninformed family member	2 (1)
Unknown - unable to contact anyone in household	6 (4)
Missing or couldn't contact parents	143 (85)

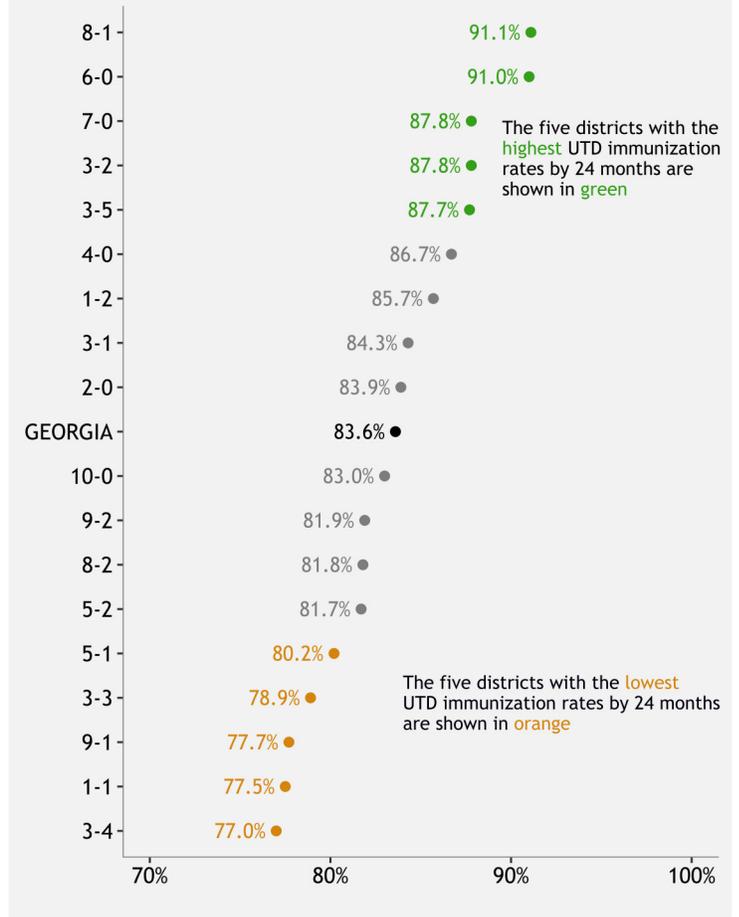
## District Immunization Rates

State-wide, the UTD immunization coverage rate by 24 months was 83.6%. This rate varied per district ranging from 77.0% to 91.1%. 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, 2017**



**Table 7: District UTD Immunization Rates, Georgia, 2017**

District	Final Sample size (n)	UTD GRITS alone (%)	UTD by 24 months (%)	UTD by End of study (%)
1-1 Northwest (Rome)	151	70.9 ± 6.2	77.5 ± 5.7	86.8 ± 4.6
1-2 North Georgia (Dalton)	133	81.2 ± 5.6	85.7 ± 5.0	95.5 ± 3.0
2-0 North (Gainesville)	168	80.4 ± 5.1	83.9 ± 4.7	92.9 ± 3.3
3-1 Cobb-Douglas	178	74.7 ± 5.7	84.3 ± 4.8	92.1 ± 3.6
3-2 Fulton	189	79.9 ± 5.2	87.8 ± 4.2	93.1 ± 3.3
3-3 Clayton	133	70.7 ± 6.4	78.9 ± 5.7	88.0 ± 4.6
3-4 Gwinnett, Newton, Rockdale (GNR)	174	73.6 ± 6.0	77.0 ± 5.8	91.4 ± 3.8
3-5 DeKalb	155	82.6 ± 5.5	87.7 ± 4.7	96.1 ± 2.8
4-0 LaGrange	173	82.1 ± 5.0	86.7 ± 4.5	93.6 ± 3.2
5-1 South Central (Dublin)	81	75.3 ± 6.2	80.2 ± 5.7	95.1 ± 3.1
5-2 North Central (Macon)	164	76.8 ± 5.4	81.7 ± 5.0	89.6 ± 3.9
6-0 East Central (Augusta)	144	87.5 ± 4.6	91.0 ± 4.0	96.5 ± 2.6
7-0 West Central (Columbus)	123	78.0 ± 5.8	87.8 ± 4.6	94.3 ± 3.3
8-1 South (Valdosta)	123	85.4 ± 4.9	91.1 ± 3.9	94.3 ± 3.2
8-2 Southwest (Albany)	132	79.5 ± 5.4	81.8 ± 5.2	92.4 ± 3.6
9-1 Coastal (Savannah)	166	71.1 ± 6.0	77.7 ± 5.5	89.8 ± 4.0
9-2 Southeast (Waycross)	144	76.4 ± 5.4	81.9 ± 4.9	91.0 ± 3.7
10-0 Northeast (Athens)	153	78.4 ± 5.4	83.0 ± 4.9	88.9 ± 4.1
<b>Georgia</b>	<b>2684</b>	<b>77.9 ± 1.4</b>	<b>83.6 ± 1.3</b>	<b>92.3 ± 0.9</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.

The lower portion of the table addresses the vaccine antigen-specific coverage rates by 24 months and only includes 2017 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, 2017**

Category	District(s) in 1st Place	District(s) in 2nd Place	District(s) in 3rd Place	State
Highest Response Rate	2-0 100.0%	9-2 98.6%	1-2 98.5%	94.1%
Highest UTD by 24 months	8-1 91.1%	6-0 91.0%	3-2 and 7-0 87.8%	83.6%
Highest UTD by 24 months based on GRITS alone	6-0 87.5%	8-1 85.4%	3-5 82.6%	77.9%
Highest UTD by end of data collection	6-0 96.5%	3-5 96.1%	1-2 95.5%	92.3%
Greatest Increase in UTD by 24 months from 2016 to 2017	6-0 11.7%	3-5 10.4%	4-0 5.7%	1.5%
Greatest Increase in UTD from 24 months to end of data collection	5-1 14.9%	3-4 14.4%	9-1 12.1%	8.7%
Highest Coverage by 24 months: 4+ DTaP Doses	6-0 92.4%	8-1 91.9%	3-5 89.7%	85.6%
Highest Coverage by 24 months: 3+ Polio Doses	5-1 97.5%	3-5 97.4%	8-2 97.0%	94.6%
Highest Coverage by 24 months: 1 MMR Dose	3-5 98.1%	8-1 96.7%	6-0 96.5%	93.4%
Highest Coverage by 24 months: UTD Hib	3-2 94.7%	8-1 94.3%	3-5 and 7-0 93.5%	90.3%
Highest Coverage by 24 months: 3+ Hepatitis B Doses	3-5 98.7%	8-2 98.5%	3-2 and 8-1 98.4%	95.8%
Highest Coverage by 24 months: 1 Varicella Dose	3-5 96.8%	8-1 96.7%	6-0 96.5%	93.3%
Highest Coverage by 24 months: UTD PCV	3-5 96.1%	3-2 95.2%	6-0 95.1%	92.4%
Highest Coverage by 24 months: 2+ Hepatitis A Doses	7-0 74.8%	1-2 67.7%	8-1 67.5%	60.8%
Highest Coverage: Hepatitis B Birth Dose by 4 days old	8-1 96.7%	5-1 96.3%	5-2 94.5%	86.5%

## WIC Enrollment Immunization Rates

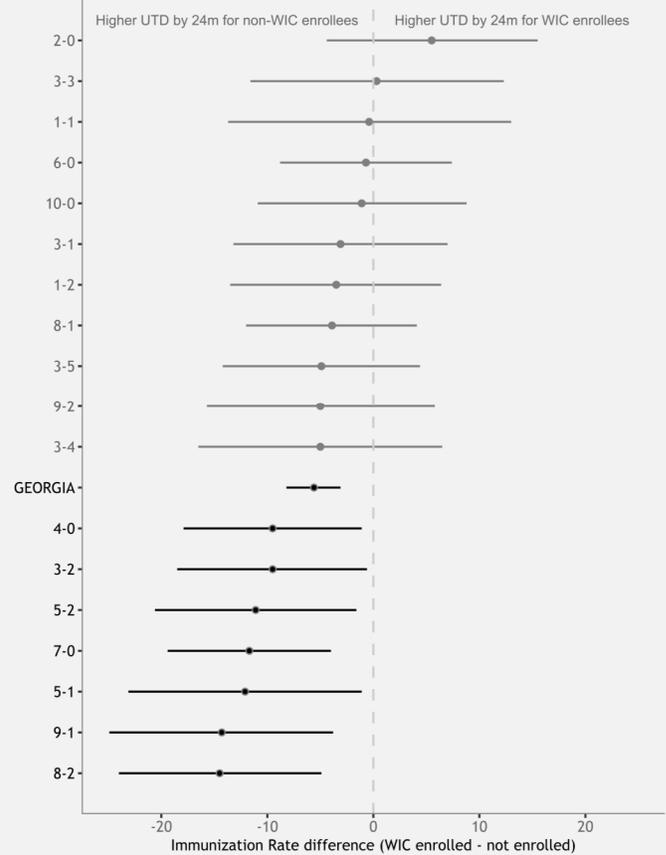
The difference in UTD immunization rate by 24 months between WIC-enrolled children and those not enrolled in WIC are shown in Table 9 for each district. The confidence intervals for these rates are graphed in Figure 5. Confidence intervals that do not overlap zero are **bolded** in Table 9 and shown 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 (81.4%) than those not enrolled in WIC (87.0%).

Significant differences were found between WIC enrollees and non-enrollees in Districts 3-2, 4-0, 5-1, 5-2, 7-0, 8-2 and 9-1. 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.

**Figure 5: Difference in UTD Immunization Rate by 24 months between WIC Enrollment Groups, Georgia, 2017**



**Table 9: Difference in UTD Immunization Rate by 24 months between WIC Enrollment Groups, Georgia, 2017**

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)	77.4%	77.8%	-0.4%	-13.7% - 13.0%
1-2 North Georgia (Dalton)	84.2%	87.7%	-3.5%	-13.5% - 6.4%
2-0 North (Gainesville)	86.1%	80.6%	5.5%	-4.4% - 15.5%
3-1 Cobb-Douglas	82.4%	85.5%	-3.1%	-13.2% - 7.0%
<b>3-2 Fulton</b>	<b>82.3%</b>	<b>91.8%</b>	<b>-9.5%</b>	<b>-18.5% - -0.6%</b>
3-3 Clayton	79.1%	78.7%	0.3%	-11.6% - 12.3%
3-4 Gwinnett, Newton, Rockdale (GNR)	75.0%	80.0%	-5.0%	-16.5% - 6.5%
3-5 DeKalb	86.0%	90.9%	-4.9%	-14.2% - 4.4%
<b>4-0 LaGrange</b>	<b>83.0%</b>	<b>92.5%</b>	<b>-9.5%</b>	<b>-17.9% - -1.1%</b>
<b>5-1 South Central (Dublin)</b>	<b>76.4%</b>	<b>88.5%</b>	<b>-12.1%</b>	<b>-23.1% - -1.1%</b>
<b>5-2 North Central (Macon)</b>	<b>78.0%</b>	<b>89.1%</b>	<b>-11.1%</b>	<b>-20.6% - -1.6%</b>
6-0 East Central (Augusta)	90.7%	91.4%	-0.7%	-8.8% - 7.4%
<b>7-0 West Central (Columbus)</b>	<b>84.9%</b>	<b>96.7%</b>	<b>-11.7%</b>	<b>-19.4% - -4.0%</b>
8-1 South (Valdosta)	90.0%	93.9%	-3.9%	-12.0% - 4.1%
<b>8-2 Southwest (Albany)</b>	<b>78.6%</b>	<b>93.1%</b>	<b>-14.5%</b>	<b>-24.0% - -4.9%</b>
<b>9-1 Coastal (Savannah)</b>	<b>71.6%</b>	<b>85.9%</b>	<b>-14.3%</b>	<b>-24.9% - -3.8%</b>
9-2 Southeast (Waycross)	80.7%	85.7%	-5.0%	-15.7% - 5.8%
10-0 Northeast (Athens)	82.5%	83.6%	-1.1%	-10.9% - 8.8%
<b>Georgia</b>	<b>81.4%</b>	<b>87.0%</b>	<b>-5.6%</b>	<b>-8.2% - -3.1%</b>

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



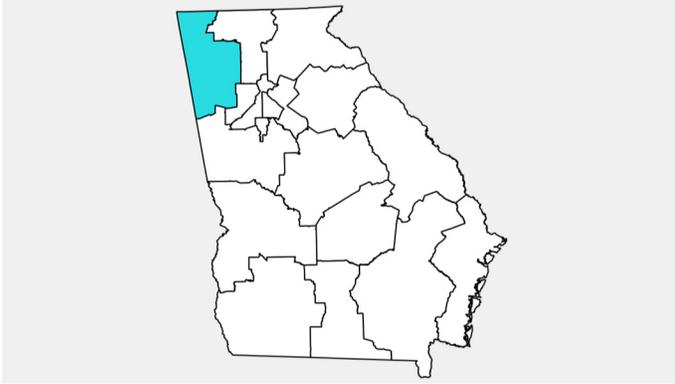
# Section III: Health District Immunization Reports <sup>19</sup>

## Immunization Study Teams by District, Georgia Immunization Study, 2017

1-1	Janet Eberhart, RN, BSN Katherine Baker	Immunization Coordinator
1-2	Ashley Ridley, RN, BSHA Angie Callaway, RN,BSN Denise Bowman, RN Graham Erwood Graham Marchman , RN Karen Penland, RN Marie Smith, RN, BSN 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	Janna McWilson, MSN, RN Nina Posley, LPN	Immunization Coordinator
3-4	Gloria Melvin Laquitta Craft, RN LaToya Porter, LPN	Immunization Coordinator
3-5	Janet Kelly Angela Bines Angela Black Rashid McGriff	Immunization Coordinator
4-0	Amy Fenn, RN, BSN Tina Arnold	Immunization Coordinator
5-1	Patty Portwood, BS, M. Ed Amy Tanner, RN, BSN Brenda Churchwell Brenda Williams, RN, BSN Bridgette Clements DeAnna Brown, RN, BSN Jina Adams, FNP-C Joni Wilson, RN Kristen Wilson, BSN, RN Rachel Baggett Shakira Brown Suzanne Usher, RN, BSN Terri Griffin, RN, BSN Tina Scarborough, LPN	Immunization Coordinator
5-2	Judy McChargue, RN, BSN	Immunization Coordinator
6-0	Susan Edmunds, RN	Immunization Coordinator
7-0	Cathy Henderson, RN	Immunization Coordinator
8-1	Reomona Thomas, RN, MSN Kenneth Lowery, MPH	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	Hansey Dionne	Immunization Coordinator

# District 1-1

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



## Final Sample Determination

The original 2017 GIS sample for District 1-1 consisted of 168 children born in January of 2015 (Table 1-1-A). Of these, 3 children were determined to be ineligible for the study. Of those eligible, 14 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 151. 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 2017.

## Immunization Rates

In District 1-1, the UTD immunization rate by 24 months of age was 77.5%, which was lower than the 2016 rate (82.2%) and the state average (83.6%) (Table 1-1-B). The UTD immunization rate based on GRITS alone was 70.9%, lower than the 2016 rate (76.9%) and state average (77.9%). The UTD immunization rate by end of data collection was 86.8%, which was lower than the 2016 rate (89.9%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 1-1-B and Figure 1-1-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 1-1-B.

## Immunization Administration

Of the 2,637 vaccine doses administered to the District 1-1 cohort, 60 (2.3%) were administered by public health providers and 2,577 (97.7%) were administered by private providers.

Figure 1-1-B: Sampling per County, District 1-1, 2017

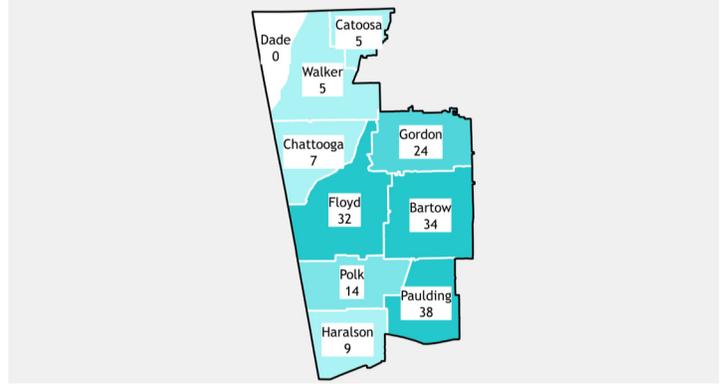


Table 1-1-A: GIS Sampling Scheme, District 1-1, 2017

	2016	2017	State 2017
Original sample (n)	180	168	3062
Ineligible (n)	9	3	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	171	165	2853
Unable to locate <sup>†</sup> (n)	2	14	169
Final sample (n)	169	151	2684
Response rate (%)	98.8	91.5	94.1

<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, 2017

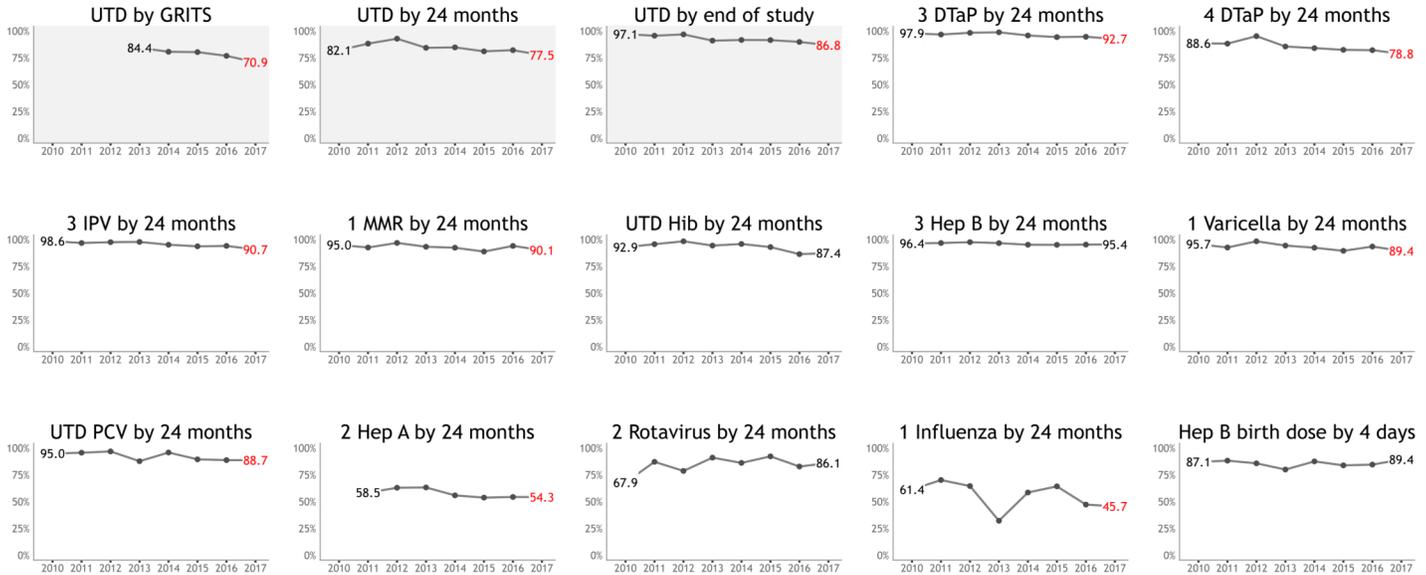
	2016 n = 169 (%)	2017 n = 151 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	76.9 ± 5.2	<b>70.9 ± 6.2</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	82.2 ± 4.7	<b>77.5 ± 5.7</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	89.9 ± 3.7	<b>86.8 ± 4.6</b>	92.3 ± 0.9
3 DTaP by 24 months	94.7 ± 2.8	<b>92.7 ± 3.5</b>	95.9 ± 0.7
4 DTaP by 24 months	82.2 ± 4.7	<b>78.8 ± 5.6</b>	85.6 ± 1.2
3 IPV by 24 months	94.1 ± 2.9	<b>90.7 ± 4.0</b>	94.6 ± 0.8
1 MMR by 24 months	94.1 ± 2.9	<b>90.1 ± 4.1</b>	93.4 ± 0.8
UTD Hib by 24 months	86.4 ± 4.2	87.4 ± 4.5	90.3 ± 1.0
3 Hep B by 24 months	95.3 ± 2.6	95.4 ± 2.9	95.8 ± 0.7
1 Varicella by 24 months	93.5 ± 3.0	<b>89.4 ± 4.2</b>	93.3 ± 0.8
UTD PCV by 24 months	88.8 ± 3.9	<b>88.7 ± 4.3</b>	92.4 ± 0.9
2 Hep A by 24 months	54.4 ± 6.1	<b>54.3 ± 6.8</b>	60.8 ± 1.7
2 Rotavirus by 24 months	82.8 ± 4.6	<b>86.1 ± 4.7</b>	87.6 ± 1.1
1+ Influenza by 24 months	47.3 ± 6.2	<b>45.7 ± 6.8</b>	60.7 ± 1.7
Hep B birth dose by 4 days	84.6 ± 4.4	<b>89.4 ± 4.2</b>	86.5 ± 1.2

<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 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 1-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 1-1, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 1-1 sample (and all District 1-1 births in 2015), 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 between the demographic subgroups in District 1-1.

**Table 1-1-C: District 1-1 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		1-1 Sample ‡ n = 151	All 2015 births ‡ N = 7,840	GRITS alone n = 151 (%)	24 months n = 151 (%)	End of study n = 151 (%)
Mother's race*	White	133 (88.1%)	6739 (86.0%)	72.9 ± 6.5	78.9 ± 5.9	85.0 ± 5.2
	Black	16 (10.6%)	829 (10.6%)	50.0 ± 21.0	62.5 ± 20.0	100.0 ± 0.0
	Asian	1 (0.7%)	82 (1.0%)	sample size is too small to generate estimates		
	Other	1 (0.7%)	190 (2.4%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	128 (84.8%)	7013 (89.5%)	71.1 ± 6.7	76.6 ± 6.3	86.7 ± 5.0
	Hispanic	23 (15.2%)	796 (10.2%)	69.6 ± 16.0	82.6 ± 13.0	87.0 ± 12.0
Mother's age*	<25 years old	70 (46.4%)	2922 (37.3%)	67.1 ± 9.4	72.9 ± 8.9	82.9 ± 7.6
	25 - 35 years old	62 (41.1%)	4087 (52.1%)	67.7 ± 10.0	77.4 ± 8.9	88.7 ± 6.7
	35+ years old	19 (12.6%)	831 (10.6%)	94.7 ± 8.6	94.7 ± 8.6	94.7 ± 8.6
Mother's education*	Some college or higher	57 (37.7%)	3849 (49.1%)	71.9 ± 10.0	78.9 ± 9.1	87.7 ± 7.3
	High School Graduate/GED	63 (41.7%)	2422 (30.9%)	66.7 ± 10.0	71.4 ± 9.6	81.0 ± 8.3
	9th - 11th grade	19 (12.6%)	1120 (14.3%)	78.9 ± 16.0	84.2 ± 14.0	94.7 ± 8.6
	<9th grade	8 (5.3%)	339 (4.3%)	75.0 ± 26.0	87.5 ± 20.0	100.0 ± 0.0
Marital status*	Married	80 (53.0%)	4624 (59.0%)	75.0 ± 8.1	82.5 ± 7.1	90.0 ± 5.6
	Unmarried	71 (47.0%)	3208 (40.9%)	66.2 ± 9.4	71.8 ± 9.0	83.1 ± 7.5
Child's WIC status	WIC	115 (76.2%)		70.4 ± 7.1	77.4 ± 6.5	87.8 ± 5.1
	Non-WIC	36 (23.8%)		72.2 ± 13.0	77.8 ± 12.0	83.3 ± 10.0
Number of provider(s) visited	One	119 (78.8%)		76.5 ± 6.5	81.5 ± 6.0	89.1 ± 4.8
	Two	26 (17.2%)		61.5 ± 16.0	69.2 ± 15.0	84.6 ± 12.0
	Three or more	3 (2.0%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	128 (84.8%)		78.1 ± 6.1	82.0 ± 5.7	89.8 ± 4.5
	Public	1 (0.7%)		sample size is too small to generate estimates		
	Both	19 (12.6%)		36.8 ± 19.0	63.2 ± 19.0	84.2 ± 14.0

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 1-2

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

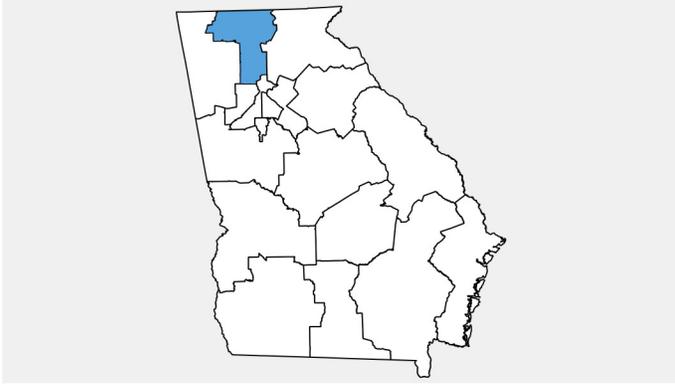
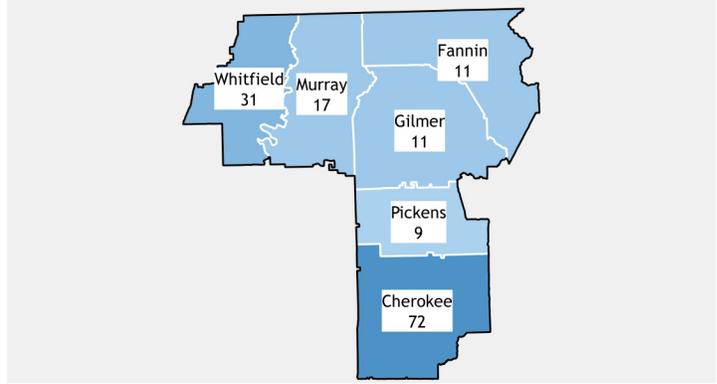


Figure 1-2-B: Sampling per County, District 1-2, 2017



## Final Sample Determination

The original 2017 GIS sample for District 1-2 consisted of 151 children born in January of 2015 (Table 1-2-A). Of these, 16 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 1-2, which was used to calculate all rates, was 133. 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 2017.

## Immunization Rates

In District 1-2, the UTD immunization rate by 24 months of age was 85.7%, which was higher than the 2016 rate (80.5%) and the state average (83.6%) (Table 1-2-B). The UTD immunization rate based on GRITS alone was 81.2%, higher than the 2016 rate (78.0%) and the state average (77.9%). The UTD immunization rate by end of data collection was 95.5%, which was higher than the 2016 rate (91.2%), and the state average (92.3%).

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 2017 are shown as **red** in Table 1-2-B and Figure 1-2-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 1-2-B.

## Immunization Administration

Of the 2,482 vaccine doses administered to the District 1-2 cohort, 105 (4.2%) were administered by public health providers and 2,377 (95.8%) were administered by private providers.

Table 1-2-A: GIS Sampling Scheme, District 1-2, 2017

	2016	2017	State 2017
Original sample (n)	168	151	3062
Ineligible (n)	8	16	209
(Refused to participate) (n)	0	4	16
Eligible sample (n)	160	135	2853
Unable to locate <sup>†</sup> (n)	1	2	169
Final sample (n)	159	133	2684
Response rate (%)	99.4	98.5	94.1

<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, 2017

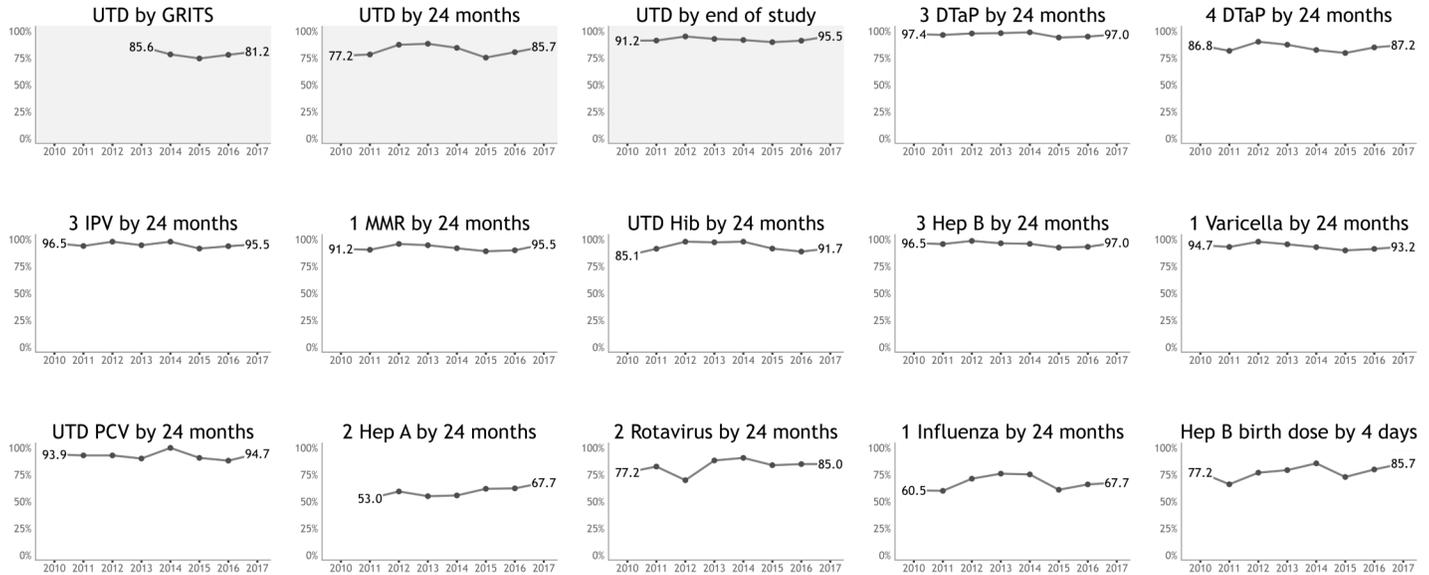
	2016 n = 159 (%)	2017 n = 133 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	78.0 ± 5.2	81.2 ± 5.6	77.9 ± 1.4
UTD immunization rate* by 24 months	80.5 ± 4.9	85.7 ± 5.0	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	91.2 ± 3.5	95.5 ± 3.0	92.3 ± 0.9
3 DTaP by 24 months	95.0 ± 2.7	97.0 ± 2.4	95.9 ± 0.7
4 DTaP by 24 months	84.9 ± 4.5	87.2 ± 4.8	85.6 ± 1.2
3 IPV by 24 months	93.7 ± 3.0	95.5 ± 3.0	94.6 ± 0.8
1 MMR by 24 months	89.9 ± 3.7	95.5 ± 3.0	93.4 ± 0.8
UTD Hib by 24 months	88.7 ± 3.9	91.7 ± 3.9	90.3 ± 1.0
3 Hep B by 24 months	93.1 ± 3.2	97.0 ± 2.4	95.8 ± 0.7
1 Varicella by 24 months	91.2 ± 3.5	93.2 ± 3.6	93.3 ± 0.8
UTD PCV by 24 months	88.1 ± 4.0	94.7 ± 3.2	92.4 ± 0.9
2 Hep A by 24 months	62.3 ± 6.0	67.7 ± 6.7	60.8 ± 1.7
2 Rotavirus by 24 months	84.9 ± 4.5	85.0 ± 5.1	87.6 ± 1.1
1+ Influenza by 24 months	66.0 ± 5.9	67.7 ± 6.7	60.7 ± 1.7
Hep B birth dose by 4 days	79.9 ± 5.0	85.7 ± 5.0	86.5 ± 1.2

<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 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 1-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 1-2, 2010-2017**



### Demographic Findings

The demographic breakdown of the District 1-2 sample (and all District 1-2 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 1-2-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 1-2-C.

**Table 1-2-C: District 1-2 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		1-2 Sample † n = 133	All 2015 births † N = 5,497	GRITS alone n = 133 (%)	24 months n = 133 (%)	End of study n = 133 (%)
Mother's race*	White	124 (93.2%)	4982 (90.6%)	81.5 ± 5.8	86.3 ± 5.1	95.2 ± 3.2
	Black	4 (3.0%)	268 (4.9%)	sample size is too small to generate estimates	sample size is too small to generate estimates	sample size is too small to generate estimates
	Asian	1 (0.8%)	98 (1.8%)	sample size is too small to generate estimates	sample size is too small to generate estimates	sample size is too small to generate estimates
	Other	4 (3.0%)	149 (2.7%)	sample size is too small to generate estimates	sample size is too small to generate estimates	sample size is too small to generate estimates
Mother's ethnicity*	Non-Hispanic	103 (77.4%)	4119 (74.9%)	80.6 ± 6.4	86.4 ± 5.6	94.2 ± 3.8
	Hispanic	30 (22.6%)	1323 (24.1%)	83.3 ± 11.0	83.3 ± 11.0	100.0 ± 0.0
Mother's age*	<25 years old	45 (33.8%)	1650 (30.0%)	86.7 ± 8.4	88.9 ± 7.7	97.8 ± 3.6
	25 - 35 years old	62 (46.6%)	3027 (55.1%)	79.0 ± 8.5	82.3 ± 8.0	93.5 ± 5.1
	35+ years old	26 (19.5%)	820 (14.9%)	76.9 ± 14.0	88.5 ± 10.0	96.2 ± 6.2
Mother's education*	Some college or higher	62 (46.6%)	2737 (49.8%)	79.0 ± 8.5	85.5 ± 7.4	91.9 ± 5.7
	High School Graduate/GED	41 (30.8%)	1546 (28.1%)	80.5 ± 10.0	80.5 ± 10.0	97.6 ± 4.0
	9th - 11th grade	17 (12.8%)	713 (13.0%)	88.2 ± 13.0	94.1 ± 9.4	100.0 ± 0.0
	<9th grade	6 (4.5%)	367 (6.7%)	83.3 ± 25.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	87 (65.4%)	3579 (65.1%)	83.9 ± 6.5	88.5 ± 5.6	95.4 ± 3.7
	Unmarried	46 (34.6%)	1916 (34.9%)	76.1 ± 10.0	80.4 ± 9.6	95.7 ± 5.0
Child's WIC status	WIC	76 (57.1%)		80.3 ± 7.5	84.2 ± 6.9	97.4 ± 3.0
	Non-WIC	57 (42.9%)		82.5 ± 8.3	87.7 ± 7.2	93.0 ± 5.6
Number of provider(s) visited	One	92 (69.2%)		83.7 ± 6.3	90.2 ± 5.1	96.7 ± 3.1
	Two	36 (27.1%)		80.6 ± 11.0	80.6 ± 11.0	97.2 ± 4.5
	Three or more	1 (0.8%)		sample size is too small to generate estimates	sample size is too small to generate estimates	sample size is too small to generate estimates
Type of provider(s) visited	Private	107 (80.5%)		86.0 ± 5.5	<b>90.7 ± 4.6</b>	97.2 ± 2.6
	Public	2 (1.5%)		sample size is too small to generate estimates	sample size is too small to generate estimates	sample size is too small to generate estimates
	Both	20 (15.0%)		65.0 ± 18.0	<b>65.0 ± 18.0</b>	95.0 ± 8.0

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

‡ Variable was collected at time of delivery

***Bolded and italicized indicate a significant difference***

# District 2-0

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

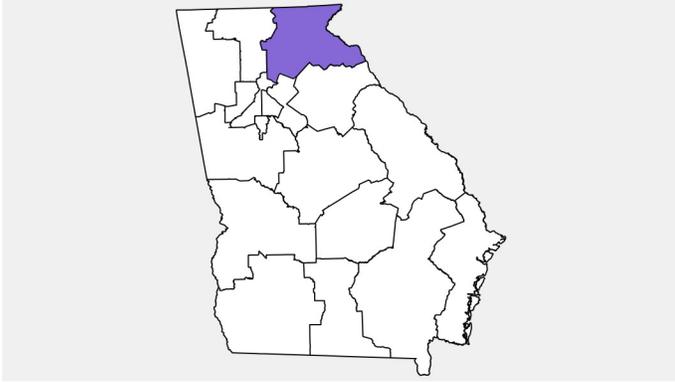
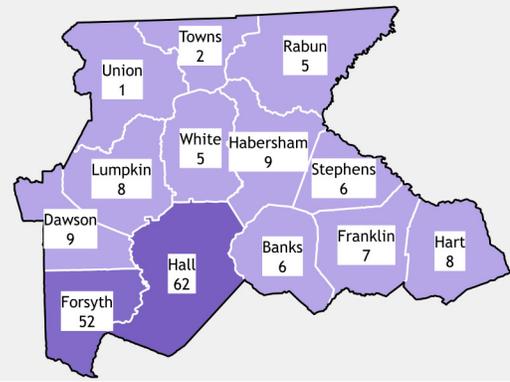


Figure 2-0-B: Sampling per County, District 2-0, 2017



## Final Sample Determination

The original 2017 GIS sample for District 2-0 consisted of 181 children born in January of 2015 (Table 2-0-A). Of these, 13 children were determined to be ineligible for the study. The final sample size for District 2-0, which was used to calculate all rates, was 168. 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 2017.

## Immunization Rates

In District 2-0, the UTD immunization rate by 24 months of age was 83.9%, which was lower than the 2016 rate (85.6%) and higher than the state average (83.6%) (Table 2-0-B). The UTD immunization rate based on GRITS alone was 80.4%, higher than the 2016 rate (78.4%) and the state average (77.9%). The UTD immunization rate by end of data collection was 92.9%, which was lower than the 2016 rate (93.5%), and higher than the state average (92.3%).

Most 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 2017 are shown as **red** in Table 2-0-B and Figure 2-0-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 2-0-B.

## Immunization Administration

Of the 3,230 vaccine doses administered to the District 2-0 cohort, 87 (2.7%) were administered by public health providers and 3,143 (97.3%) were administered by private providers.

Table 2-0-A: GIS Sampling Scheme, District 2-0, 2017

	2016	2017	State 2017
Original sample (n)	175	181	3062
Ineligible (n)	21	13	209
(Refused to participate) (n)	3	4	16
Eligible sample (n)	154	168	2853
Unable to locate <sup>†</sup> (n)	1	0	169
Final sample (n)	153	168	2684
Response rate (%)	99.4	100.0	94.1

<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, 2017

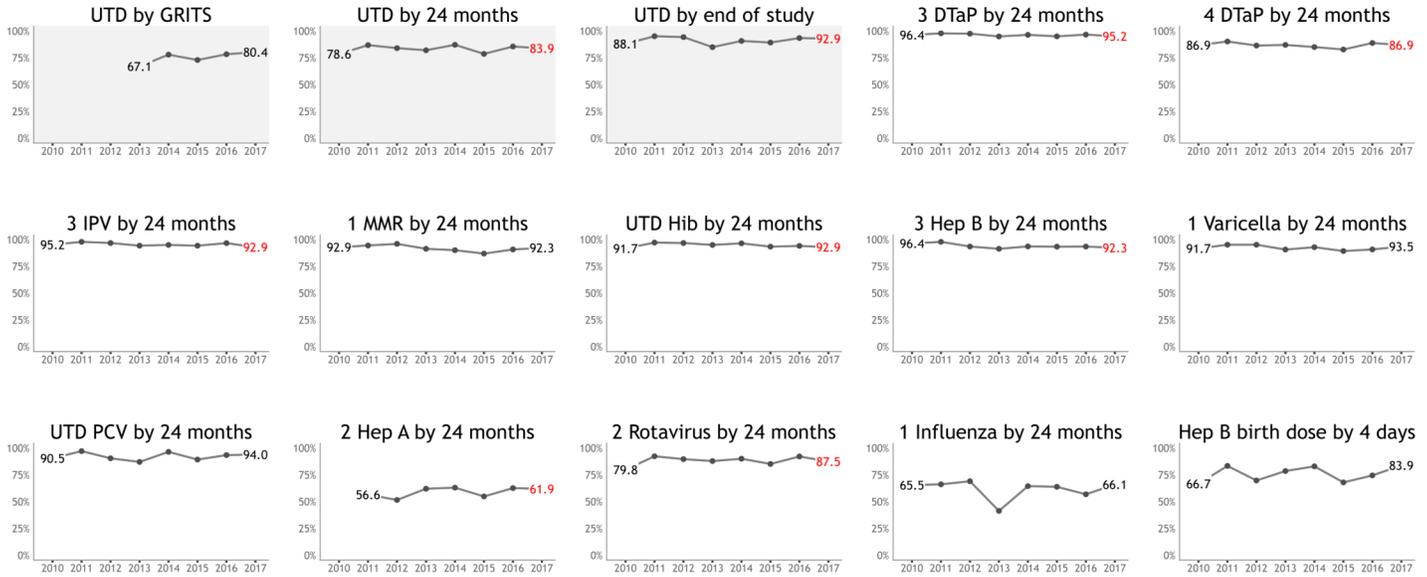
	2016 n = 153 (%)	2017 n = 168 (%)	State n = 2,648 (%)
UTD immunization rate* based on GRITS alone	78.4 ± 5.6	<b>80.4 ± 5.1</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	85.6 ± 4.8	<b>83.9 ± 4.7</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	93.5 ± 3.3	<b>92.9 ± 3.3</b>	92.3 ± 0.9
3 DTaP by 24 months	96.7 ± 2.4	<b>95.2 ± 2.8</b>	95.9 ± 0.7
4 DTaP by 24 months	88.9 ± 4.3	<b>86.9 ± 4.4</b>	85.6 ± 1.2
3 IPV by 24 months	96.7 ± 2.4	<b>92.9 ± 3.3</b>	94.6 ± 0.8
1 MMR by 24 months	90.8 ± 3.9	92.3 ± 3.5	93.4 ± 0.8
UTD Hib by 24 months	94.1 ± 3.2	<b>92.9 ± 3.3</b>	90.3 ± 1.0
3 Hep B by 24 months	93.5 ± 3.3	<b>92.3 ± 3.5</b>	<b>95.8 ± 0.7</b>
1 Varicella by 24 months	90.8 ± 3.9	93.5 ± 3.2	93.3 ± 0.8
UTD PCV by 24 months	93.5 ± 3.3	94.0 ± 3.1	92.4 ± 0.9
2 Hep A by 24 months	62.7 ± 6.6	<b>61.9 ± 6.3</b>	60.8 ± 1.7
2 Rotavirus by 24 months	92.2 ± 3.6	<b>87.5 ± 4.3</b>	87.6 ± 1.1
1+ Influenza by 24 months	56.9 ± 6.7	66.1 ± 6.1	60.7 ± 1.7
Hep B birth dose by 4 days	74.5 ± 5.9	83.9 ± 4.7	86.5 ± 1.2

<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 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 2-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 2-0, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 2-0 sample (and all District 2-0 births in 2015), 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 between the demographic subgroups in District 2-0.

**Table 2-0-C: District 2-0 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		2-0 Sample ‡ n = 168	All 2015 births ‡ N = 7,778	GRITS alone n = 168 (%)	24 months n = 168 (%)	End of study n = 168 (%)
Mother's race*	White	148 (88.1%)	6741 (86.7%)	79.1 ± 5.6	83.1 ± 5.2	91.9 ± 3.8
	Black	6 (3.6%)	412 (5.3%)	83.3 ± 25.0	83.3 ± 25.0	100.0 ± 0.0
	Asian	10 (6.0%)	424 (5.4%)	90.0 ± 16.0	90.0 ± 16.0	100.0 ± 0.0
	Other	4 (2.4%)	201 (2.6%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	124 (73.8%)	5927 (76.2%)	78.2 ± 6.2	81.5 ± 5.8	90.3 ± 4.4
	Hispanic	44 (26.2%)	1753 (22.5%)	86.4 ± 8.7	90.9 ± 7.3	100.0 ± 0.0
Mother's age*	<25 years old	45 (26.8%)	2299 (29.6%)	80.0 ± 10.0	82.2 ± 9.5	91.1 ± 7.1
	25 - 35 years old	93 (55.4%)	4277 (55.0%)	81.7 ± 6.7	86.0 ± 6.0	94.6 ± 3.9
	35+ years old	30 (17.9%)	1202 (15.5%)	76.7 ± 13.0	80.0 ± 12.0	90.0 ± 9.2
Mother's education*	Some college or higher	85 (50.6%)	4066 (52.3%)	78.8 ± 7.4	83.5 ± 6.7	90.6 ± 5.3
	High School Graduate/GED	49 (29.2%)	2190 (28.2%)	87.8 ± 7.8	87.8 ± 7.8	95.9 ± 4.7
	9th - 11th grade	23 (13.7%)	965 (12.4%)	73.9 ± 15.0	73.9 ± 15.0	95.7 ± 7.1
	<9th grade	5 (3.0%)	445 (5.7%)	sample size is too small to generate estimates		
Marital status*	Married	108 (64.3%)	5097 (65.5%)	81.5 ± 6.3	84.3 ± 5.9	92.6 ± 4.2
	Unmarried	59 (35.1%)	2679 (34.4%)	79.7 ± 8.8	83.1 ± 8.2	93.2 ± 5.5
Child's WIC status	WIC	101 (60.1%)		84.2 ± 6.1	86.1 ± 5.8	95.0 ± 3.6
	Non-WIC	67 (39.9%)		74.6 ± 8.9	80.6 ± 8.1	89.6 ± 6.3
Number of provider(s) visited	One	133 (79.2%)		84.2 ± 5.3	88.0 ± 4.7	95.5 ± 3.0
	Two	29 (17.3%)		79.3 ± 13.0	82.8 ± 12.0	100.0 ± 0.0
	Three or more					
Type of provider(s) visited	Private	149 (88.7%)		85.2 ± 4.9	88.6 ± 4.4	96.0 ± 2.7
	Public	2 (1.2%)		sample size is too small to generate estimates		
	Both	11 (6.5%)		63.6 ± 24.0	72.7 ± 22.0	100.0 ± 0.0

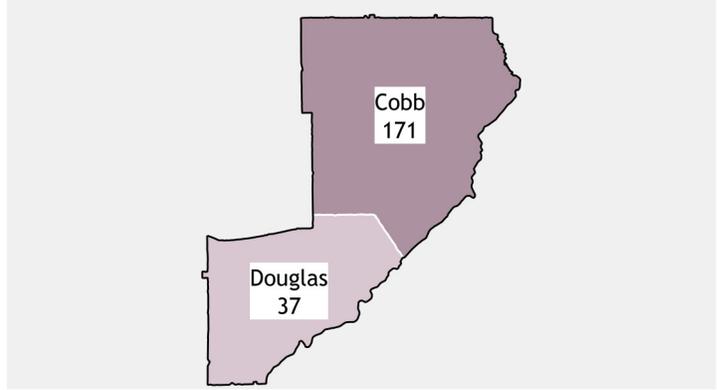
‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Italicized and bolded indicate a significant difference**

# District 3-1

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



Figure 3-1-B: Sampling per County, District 3-1, 2017



## Final Sample Determination

The original 2017 GIS sample for District 3-1 consisted of 206 children born in January of 2015 (Table 3-1-A). Of these, 21 children were determined to be ineligible for the study. Of those eligible, 7 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 178. 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 2017.

## Immunization Rates

In District 3-1, the UTD immunization rate by 24 months of age was 84.3%, which was lower than the 2016 rate (85.4%) and higher than the state average (83.6%) (Table 3-1-B). The UTD immunization rate based on GRITS alone was 74.7%, lower than the 2016 rate (78.7%) and the state average (77.9%). The UTD immunization rate by end of data collection was 92.1%, which was lower than the 2016 rate (95.1%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 3-1-B and Figure 3-1-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 3-1-B.

## Immunization Administration

Of the 3,402 vaccines doses administered to the District 3-1 cohort, 177 (5.2%) were administered by public health providers and 3,225 (94.8%) were administered by private providers.

Table 3-1-A: GIS Sampling Scheme, District 3-1, 2017

	2016	2017	State 2017
Original sample (n)	184	206	3062
Ineligible (n)	16	21	209
(Refused to participate) (n)	1	0	16
Eligible sample (n)	168	185	2853
Unable to locate <sup>†</sup> (n)	4	7	169
Final sample (n)	164	178	2684
Response rate (%)	97.6	96.2	94.1

<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, 2017

	2016 n = 164 (%)	2017 n = 178 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	78.7 ± 5.7	<b>74.7 ± 5.7</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	85.4 ± 4.9	<b>84.3 ± 4.8</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	95.1 ± 3.0	<b>92.1 ± 3.6</b>	92.3 ± 0.9
3 DTaP by 24 months	97.0 ± 2.4	<b>94.4 ± 3.0</b>	95.9 ± 0.7
4 DTaP by 24 months	87.8 ± 4.6	<b>86.5 ± 4.5</b>	85.6 ± 1.2
3 IPV by 24 months	94.5 ± 3.2	<b>91.6 ± 3.7</b>	94.6 ± 0.8
1 MMR by 24 months	97.6 ± 2.1	<b>93.3 ± 3.3</b>	93.4 ± 0.8
UTD Hib by 24 months	95.1 ± 3.0	<b>91.6 ± 3.7</b>	90.3 ± 1.0
3 Hep B by 24 months	93.9 ± 3.3	<b>93.8 ± 3.2</b>	95.8 ± 0.7
1 Varicella by 24 months	96.3 ± 2.6	<b>93.3 ± 3.3</b>	93.3 ± 0.8
UTD PCV by 24 months	96.3 ± 2.6	<b>91.6 ± 3.7</b>	92.4 ± 0.9
2 Hep A by 24 months	71.3 ± 6.3	<b>60.7 ± 6.4</b>	60.8 ± 1.7
2 Rotavirus by 24 months	87.8 ± 4.6	<b>89.9 ± 4.0</b>	87.6 ± 1.1
1+ Influenza by 24 months	66.5 ± 6.6	<b>64.6 ± 6.3</b>	60.7 ± 1.7
Hep B birth dose by 4 days	73.8 ± 6.1	<b>78.1 ± 5.5</b>	<b>86.5 ± 1.2</b>

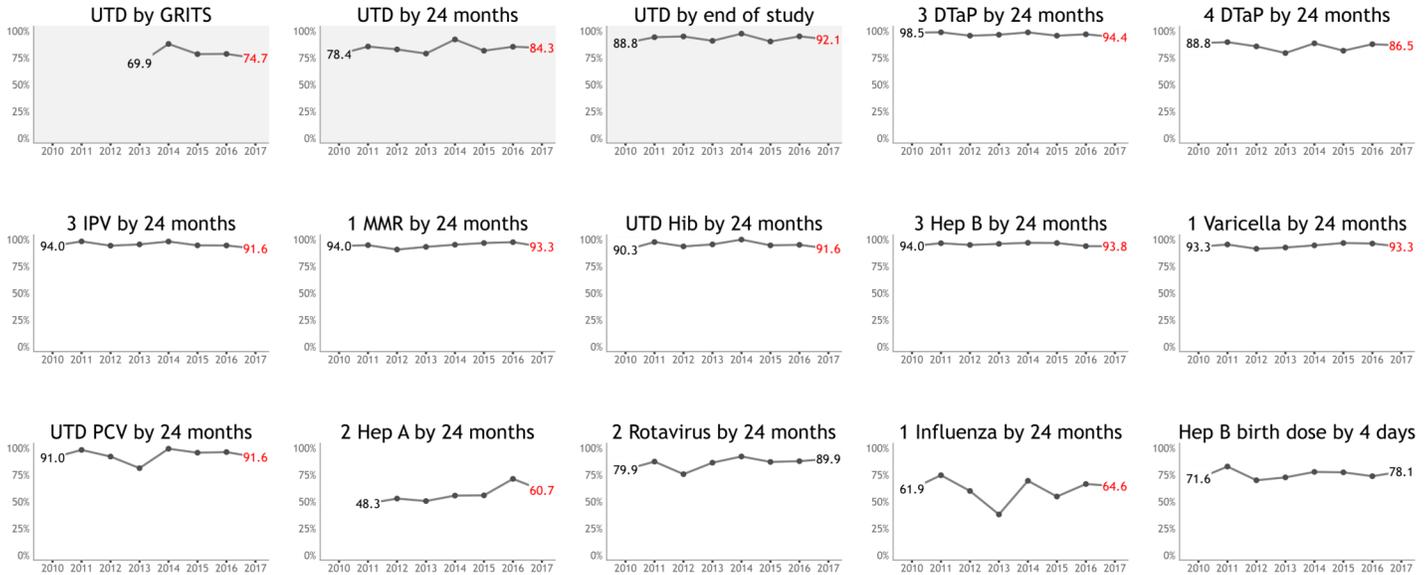
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 3-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-1, 2010-2017**



### Demographic Findings

The demographic breakdown of the District 3-1 sample (and all District 3-1 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 3-1-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found between the demographic subgroups in District 3-1.

**Table 3-1-C: District 3-1 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-1 Sample $n = 178$	All 2015 births $N = 11,106$	GRITS alone $n = 178$ (%)	24 months $n = 178$ (%)	End of study $n = 178$ (%)
Mother's race*	White	115 (64.6%)	6378 (57.4%)	76.5 ± 7.0	87.8 ± 5.4	93.0 ± 4.2
	Black	51 (28.7%)	3626 (32.6%)	68.6 ± 11.0	76.5 ± 10.0	88.2 ± 7.9
	Asian	10 (5.6%)	604 (5.4%)	80.0 ± 22.0	80.0 ± 22.0	100.0 ± 0.0
	Other	2 (1.1%)	498 (4.5%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	140 (78.7%)	8974 (80.8%)	72.9 ± 6.6	82.9 ± 5.6	90.7 ± 4.3
	Hispanic	38 (21.3%)	2011 (18.1%)	81.6 ± 11.0	89.5 ± 8.8	97.4 ± 4.6
Mother's age*	<25 years old	39 (21.9%)	2315 (20.8%)	82.1 ± 11.0	84.6 ± 10.0	92.3 ± 7.5
	25 - 35 years old	105 (59.0%)	6427 (57.9%)	73.3 ± 7.6	82.9 ± 6.5	89.5 ± 5.3
	35+ years old	34 (19.1%)	2364 (21.3%)	70.6 ± 14.0	88.2 ± 9.7	100.0 ± 0.0
Mother's education*	Some college or higher	118 (66.3%)	7348 (66.2%)	75.4 ± 7.0	85.6 ± 5.7	94.1 ± 3.8
	High School Graduate/GED	32 (18.0%)	2258 (20.3%)	75.0 ± 13.0	84.4 ± 11.0	87.5 ± 10.0
	9th - 11th grade	15 (8.4%)	777 (7.0%)	53.3 ± 23.0	66.7 ± 21.0	80.0 ± 18.0
	<9th grade	7 (3.9%)	437 (3.9%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	109 (61.2%)	7091 (63.8%)	78.9 ± 6.9	87.2 ± 5.6	93.6 ± 4.1
	Unmarried	69 (38.8%)	4011 (36.1%)	68.1 ± 9.9	79.7 ± 8.5	89.9 ± 6.4
Child's WIC status	WIC	68 (38.2%)		70.6 ± 9.7	82.4 ± 8.1	91.2 ± 6.1
	Non-WIC	110 (61.8%)		77.3 ± 7.0	85.5 ± 5.9	92.7 ± 4.4
Number of provider(s) visited	One	139 (78.1%)		77.0 ± 6.3	86.3 ± 5.1	93.5 ± 3.7
	Two	36 (20.2%)		69.4 ± 14.0	80.6 ± 12.0	91.7 ± 8.1
	Three or more	1 (0.6%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	159 (89.3%)		77.4 ± 5.8	86.2 ± 4.8	93.7 ± 3.4
	Public	4 (2.2%)		sample size is too small to generate estimates		
	Both	13 (7.3%)		53.8 ± 24.0	69.2 ± 23.0	84.6 ± 18.0

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

\* Variable was collected at time of delivery

**Bolded and italicized indicate a significant difference**

# District 3-2

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



Figure 3-2-B: Sampling per County, District 3-2, 2017



## Final Sample Determination

The original 2017 GIS sample for District 3-2 consisted of 214 children born in January of 2015 (Table 3-2-A). Of these, 12 children were determined to be ineligible for the study. Of those eligible, 13 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 189. 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 2017.

## Immunization Rates

In District 3-2, the UTD immunization rate by 24 months of age was 87.8%, which was higher than the 2016 rate (86.2%) and the state average (83.6%) (Table 3-2-B). The UTD immunization rate based on GRITS alone was 79.9%, lower than the 2016 rate (81.1%), and higher than the state average (77.9%). The UTD immunization rate by end of data collection was 93.1%, which was higher than the 2016 rate (92.5%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 3-2-B and Figure 3-2-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 3-2-B.

## Immunization Administration

Of the 3,654 vaccines doses administered to the District 3-2 cohort, 107 (2.9%) were administered by public health providers and 3,547 (97.1%) were administered by private providers.

Table 3-2-A: GIS Sampling Scheme, District 3-2, 2017

	2016	2017	State 2017
Original sample (n)	177	214	3062
Ineligible (n)	15	12	209
(Refused to participate) (n)	1	2	16
Eligible sample (n)	162	202	2853
Unable to locate <sup>†</sup> (n)	3	13	169
Final sample (n)	159	189	2684
Response rate (%)	98.1	93.6	94.1

<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, 2017

	2016 n = 159 (%)	2017 n = 189 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	81.1 ± 5.6	<b>79.9 ± 5.2</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	86.2 ± 5.0	<b>87.8 ± 4.2</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	92.5 ± 3.8	<b>93.1 ± 3.3</b>	92.3 ± 0.9
3 DTaP by 24 months	95.6 ± 2.9	96.8 ± 2.3	95.9 ± 0.7
4 DTaP by 24 months	86.2 ± 5.0	88.9 ± 4.1	85.6 ± 1.2
3 IPV by 24 months	95.0 ± 3.1	96.3 ± 2.4	94.6 ± 0.8
1 MMR by 24 months	95.6 ± 2.9	95.8 ± 2.6	93.4 ± 0.8
UTD Hib by 24 months	92.5 ± 3.8	94.7 ± 2.9	<b>90.3 ± 1.0</b>
3 Hep B by 24 months	95.0 ± 3.1	98.4 ± 1.6	95.8 ± 0.7
1 Varicella by 24 months	95.6 ± 2.9	95.8 ± 2.6	93.3 ± 0.8
UTD PCV by 24 months	93.7 ± 3.5	95.2 ± 2.8	92.4 ± 0.9
2 Hep A by 24 months	67.9 ± 6.7	<b>65.6 ± 6.2</b>	60.8 ± 1.7
2 Rotavirus by 24 months	85.5 ± 5.0	<b>84.7 ± 4.7</b>	87.6 ± 1.1
1+ Influenza by 24 months	69.2 ± 6.6	<b>63.0 ± 6.3</b>	60.7 ± 1.7
Hep B birth dose by 4 days	83.0 ± 5.4	86.8 ± 4.4	86.5 ± 1.2

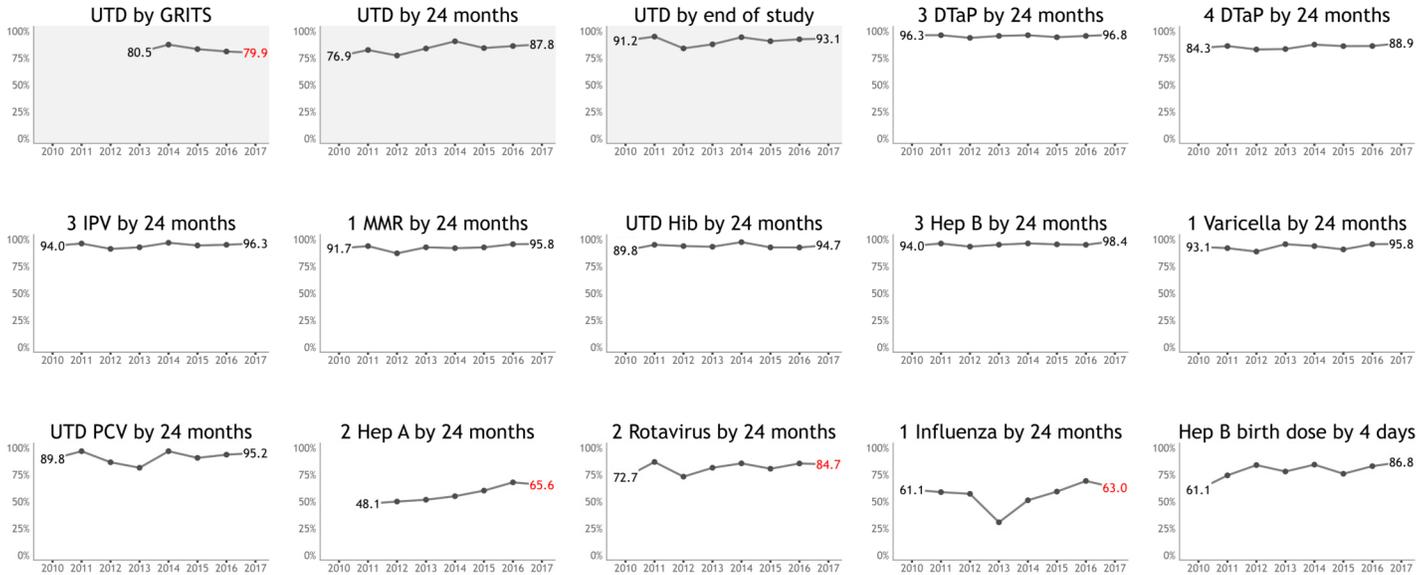
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 3-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-2, 2010-2017



**Demographic Findings**

The demographic breakdown of the District 3-2 sample (and all District 3-2 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 3-2-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 3-2-C. Brackets are used to indicate significantly different results between subgroups.

Table 3-2-C: District 3-2 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-2 Sample $n = 189$	All 2015 births $N = 12,355$	GRITS alone $n = 189$ (%)	24 months $n = 189$ (%)	End of study $n = 189$ (%)
Mother's race*	White	75 (39.7%)	4592 (37.2%)	85.3 ± 7.3	90.7 ± 6.0	98.7 ± 2.4
	Black	92 (48.7%)	6257 (50.6%)	75.0 ± 8.0	84.8 ± 6.7	88.0 ± 6.0
	Asian	14 (7.4%)	930 (7.5%)	85.7 ± 17.0	100.0 ± 0.0	100.0 ± 0.0
	Other	8 (4.2%)	576 (4.7%)	75.0 ± 27.0	75.0 ± 27.0	87.5 ± 21.0
Mother's ethnicity*	Non-Hispanic	173 (91.5%)	10825 (87.6%)	80.3 ± 5.4	88.4 ± 4.3	92.5 ± 3.6
	Hispanic	16 (8.5%)	1226 (9.9%)	75.0 ± 19.0	81.2 ± 17.0	100.0 ± 0.0
Mother's age*	<25 years old	54 (28.6%)	2870 (23.2%)	68.5 ± 11.0	<b>77.8 ± 10.0</b>	81.5 ± 9.4
	25 - 35 years old	99 (52.4%)	6902 (55.9%)	80.8 ± 7.0	89.9 ± 5.4	97.0 ± 3.1
	35+ years old	36 (19.0%)	2583 (20.9%)	94.4 ± 6.8	<b>97.2 ± 4.9</b>	100.0 ± 0.0
Mother's education*	Some college or higher	119 (63.0%)	7908 (64.0%)	87.4 ± 5.4	<b>95.8 ± 3.3</b>	97.5 ± 2.6
	High School Graduate/GED	46 (24.3%)	2762 (22.4%)	65.2 ± 13.0	<b>73.9 ± 12.0</b>	82.6 ± 10.0
	9th - 11th grade	17 (9.0%)	1220 (9.9%)	70.6 ± 20.0	<b>76.5 ± 18.0</b>	88.2 ± 14.0
	<9th grade	5 (2.6%)	258 (2.1%)	sample size is too small to generate estimates		
Marital status*	Married	103 (54.5%)	6556 (53.1%)	88.3 ± 5.6	<b>95.1 ± 3.8</b>	98.1 ± 2.4
	Unmarried	86 (45.5%)	5782 (46.8%)	69.8 ± 8.8	<b>79.1 ± 7.8</b>	87.2 ± 6.4
Child's WIC status	WIC	79 (41.8%)		73.4 ± 8.8	82.3 ± 7.6	88.6 ± 6.4
	Non-WIC	110 (58.2%)		84.5 ± 6.1	91.8 ± 4.7	96.4 ± 3.2
Number of provider(s) visited	One	152 (80.4%)		82.9 ± 5.4	89.5 ± 4.4	94.1 ± 3.4
	Two	33 (17.5%)		72.7 ± 14.0	81.8 ± 12.0	90.9 ± 8.9
	Three or more	2 (1.1%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	172 (91.0%)		82.6 ± 5.2	<b>90.1 ± 4.1</b>	94.8 ± 3.0
	Public	4 (2.1%)		sample size is too small to generate estimates		
	Both	11 (5.8%)		54.5 ± 27.0	<b>63.6 ± 26.0</b>	81.8 ± 21.0

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 3-3

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



Figure 3-3-B: Sampling per County, District 3-3, 2017



## Final Sample Determination

The original 2017 GIS sample for District 3-3 consisted of 155 children born in January of 2015 (Table 3-3-A). Of these, 13 children were determined to be ineligible for the study. Of those eligible, 9 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 133. 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 2017.

## Immunization Rates

In District 3-3, the UTD immunization rate by 24 months of age was 78.9%, which was higher than the 2016 rate (78.1%) and lower than the state average (83.6%) (Table 3-3-B). The UTD immunization rate based on GRITS alone was 70.7%, higher than the 2016 rate (68.8%), and lower than the state average (77.9%). The UTD immunization rate by end of data collection was 88.0%, which was lower than the 2016 rate (92.7%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 3-3-B and Figure 3-3-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 3-3-B.

## Immunization Administration

Of the 2,310 vaccines doses administered to the District 3-3 cohort, 62 (2.7%) were administered by public health providers and 2,248 (97.3%) were administered by private providers.

Table 3-3-A: GIS Sampling Scheme, District 3-3, 2017

	2016	2017	State 2017
Original sample (n)	117	155	3062
Ineligible (n)	6	13	209
(Refused to participate) (n)	2	5	16
Eligible sample (n)	111	142	2853
Unable to locate <sup>†</sup> (n)	15	9	169
Final sample (n)	96	133	2684
Response rate (%)	86.5	93.7	94.1

<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

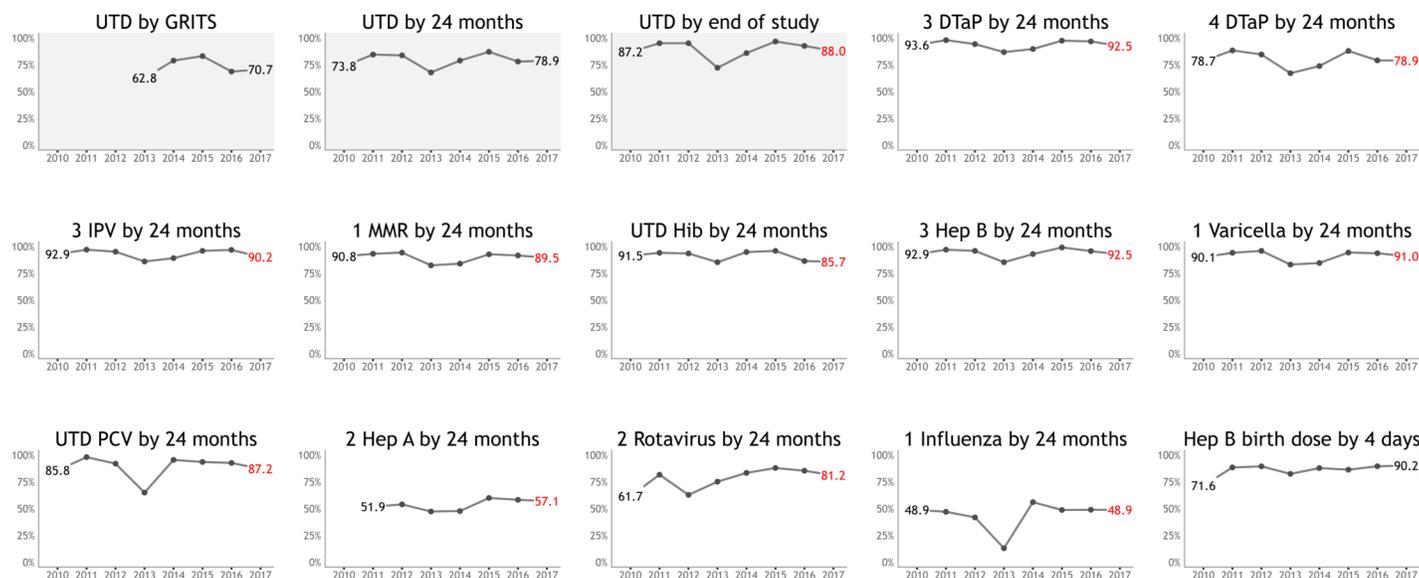
Table 3-3-B: Immunization Rates by Series and Vaccine Antigen, District 3-3, 2017

	2016 n = 96 (%)	2017 n = 133 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	68.8 ± 7.9	70.7 ± 6.4	77.9 ± 1.4
UTD immunization rate* by 24 months	78.1 ± 7.0	78.9 ± 5.7	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	92.7 ± 4.4	<b>88.0 ± 4.6</b>	92.3 ± 0.9
3 DTaP by 24 months	96.9 ± 3.0	<b>92.5 ± 3.7</b>	95.9 ± 0.7
4 DTaP by 24 months	79.2 ± 6.9	<b>78.9 ± 5.7</b>	<b>85.6 ± 1.2</b>
3 IPV by 24 months	96.9 ± 3.0	<b>90.2 ± 4.2</b>	94.6 ± 0.8
1 MMR by 24 months	91.7 ± 4.7	<b>89.5 ± 4.3</b>	93.4 ± 0.8
UTD Hib by 24 months	86.5 ± 5.8	<b>85.7 ± 4.9</b>	90.3 ± 1.0
3 Hep B by 24 months	95.8 ± 3.4	<b>92.5 ± 3.7</b>	95.8 ± 0.7
1 Varicella by 24 months	93.8 ± 4.1	<b>91.0 ± 4.0</b>	93.3 ± 0.8
UTD PCV by 24 months	92.7 ± 4.4	<b>87.2 ± 4.7</b>	<b>92.4 ± 0.9</b>
2 Hep A by 24 months	58.3 ± 8.4	<b>57.1 ± 6.9</b>	60.8 ± 1.7
2 Rotavirus by 24 months	85.4 ± 6.0	<b>81.2 ± 5.5</b>	<b>87.6 ± 1.1</b>
1+ Influenza by 24 months	49.0 ± 8.5	<b>48.9 ± 7.0</b>	<b>60.7 ± 1.7</b>
Hep B birth dose by 4 days	89.6 ± 5.2	90.2 ± 4.2	86.5 ± 1.2

<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 2016  
*Italicized and bolded font indicate a significant difference with 2017 rate*

**Figure 3-3-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-3, 2010-2017**



### Demographic Findings

The demographic breakdown of the District 3-3 sample (and all District 3-3 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 3-3-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 3-3-C.

**Table 3-3-C: District 3-3 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-3 Sample $n = 133$	All 2015 births $N = 4,277$	GRITS alone $n = 133$ (%)	24 months $n = 133$ (%)	End of study $n = 133$ (%)
Mother's race*	White	26 (19.5%)	954 (22.3%)	69.2 ± 15.0	80.8 ± 12.0	96.2 ± 6.1
	Black	97 (72.9%)	2924 (68.4%)	71.1 ± 7.4	78.4 ± 6.8	85.6 ± 5.8
	Asian	3 (2.3%)	153 (3.6%)	sample size is too small to generate estimates		
	Other	7 (5.3%)	246 (5.8%)	57.1 ± 30.0	71.4 ± 28.0	85.7 ± 21.0
Mother's ethnicity*	Non-Hispanic	104 (78.2%)	3380 (79.0%)	70.2 ± 7.2	77.9 ± 6.6	85.6 ± 5.6
	Hispanic	29 (21.8%)	802 (18.8%)	72.4 ± 13.0	82.8 ± 11.0	96.6 ± 5.5
Mother's age*	<25 years old	48 (36.1%)	1525 (35.7%)	56.2 ± 12.0	<b>66.7 ± 11.0</b>	81.2 ± 9.1
	25 - 35 years old	67 (50.4%)	2174 (50.8%)	82.1 ± 7.6	<b>88.1 ± 6.4</b>	95.5 ± 4.1
	35+ years old	18 (13.5%)	578 (13.5%)	66.7 ± 18.0	77.8 ± 16.0	77.8 ± 16.0
Mother's education*	Some college or higher	55 (41.4%)	1727 (40.4%)	76.4 ± 9.3	80.0 ± 8.7	87.3 ± 7.3
	High School Graduate/GED	49 (36.8%)	1563 (36.5%)	61.2 ± 11.0	71.4 ± 10.0	83.7 ± 8.5
	9th - 11th grade	21 (15.8%)	665 (15.5%)	66.7 ± 17.0	85.7 ± 12.0	95.2 ± 7.5
	<9th grade	6 (4.5%)	265 (6.2%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	46 (34.6%)	1381 (32.3%)	78.3 ± 9.8	87.0 ± 8.0	89.1 ± 7.4
	Unmarried	87 (65.4%)	2888 (67.5%)	66.7 ± 8.2	74.7 ± 7.5	87.4 ± 5.8
Child's WIC status	WIC	86 (64.7%)		70.9 ± 7.9	79.1 ± 7.1	89.5 ± 5.3
	Non-WIC	47 (35.3%)		70.2 ± 11.0	78.7 ± 9.6	85.1 ± 8.4
Number of provider(s) visited	One	109 (82.0%)		75.2 ± 6.7	<b>83.5 ± 5.7</b>	89.0 ± 4.8
	Two	19 (14.3%)		52.6 ± 19.0	<b>57.9 ± 18.0</b>	89.5 ± 11.0
	Three or more	3 (2.3%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	118 (88.7%)		75.4 ± 6.4	<b>83.9 ± 5.5</b>	89.8 ± 4.5
	Public	1 (0.8%)		sample size is too small to generate estimates		
	Both	12 (9.0%)		41.7 ± 23.0	<b>50.0 ± 23.0</b>	91.7 ± 13.0

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

\* Variable was collected at time of delivery

**Bolded and italicized indicate a significant difference**

# District 3-4

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

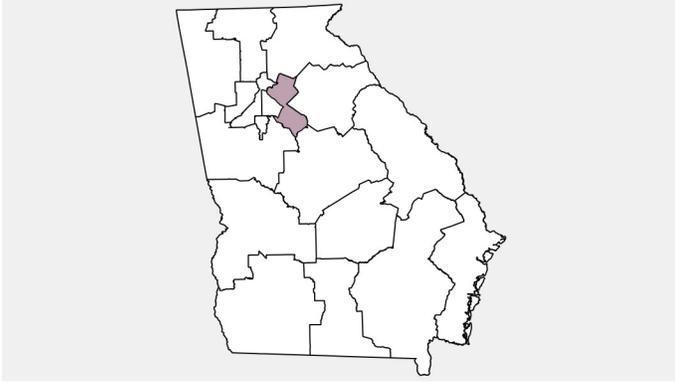


Figure 3-4-B: Sampling per County, District 3-4, 2017



## Final Sample Determination

The original 2017 GIS sample for District 3-4 consisted of 202 children born in January of 2015 (Table 3-4-A). Of these, 11 children were determined to be ineligible for the study. Of those eligible, 17 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 174. 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 2017.

## Immunization Rates

In District 3-4, the UTD immunization rate by 24 months of age was 77.0%, which was lower than the 2016 rate (82.6%) and the state average (83.6%) (Table 3-4-B). The UTD immunization rate based on GRITS alone was 73.6%, lower than the 2016 rate (76.2%) and the state average (77.9%). The UTD immunization rate by end of data collection was 91.4%, which was lower than the 2016 rate (91.9%), and the state average (92.3%).

Most 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 2017 are shown as red in Table 3-4-B and Figure 3-4-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are italicized and bolded in Table 3-4-B.

## Immunization Administration

Of the 3,249 vaccines doses administered to the District 3-4 cohort, 95 (2.9%) were administered by public health providers and 3,154 (97.1%) were administered by private providers.

Table 3-4-A: GIS Sampling Scheme, District 3-4, 2017

	2016	2017	State 2017
Original sample (n)	190	202	3062
Ineligible (n)	15	11	209
(Refused to participate) (n)	1	0	16
Eligible sample (n)	175	191	2853
Unable to locate <sup>†</sup> (n)	3	17	169
Final sample (n)	172	174	2684
Response rate (%)	98.3	91.1	94.1

<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, 2017

	2016 n = 172 (%)	2017 n = 174 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	76.2 ± 5.9	<b>73.6 ± 6.0</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	82.6 ± 5.2	<b>77.0 ± 5.8</b>	<b>83.6 ± 1.3</b>
UTD immunization rate* by end of data collection <sup>†</sup>	91.9 ± 3.8	<b>91.4 ± 3.8</b>	92.3 ± 0.9
3 DTaP by 24 months	95.3 ± 2.9	96.6 ± 2.5	95.9 ± 0.7
4 DTaP by 24 months	86.0 ± 4.8	<b>81.0 ± 5.4</b>	85.6 ± 1.2
3 IPV by 24 months	93.6 ± 3.4	95.4 ± 2.9	94.6 ± 0.8
1 MMR by 24 months	90.7 ± 4.0	92.0 ± 3.7	93.4 ± 0.8
UTD Hib by 24 months	90.7 ± 4.0	<b>84.5 ± 5.0</b>	<b>90.3 ± 1.0</b>
3 Hep B by 24 months	93.6 ± 3.4	93.7 ± 3.3	95.8 ± 0.7
1 Varicella by 24 months	90.7 ± 4.0	93.1 ± 3.5	93.3 ± 0.8
UTD PCV by 24 months	90.7 ± 4.0	91.4 ± 3.8	92.4 ± 0.9
2 Hep A by 24 months	55.2 ± 6.9	<b>51.1 ± 6.8</b>	<b>60.8 ± 1.7</b>
2 Rotavirus by 24 months	86.0 ± 4.8	89.7 ± 4.2	87.6 ± 1.1
1+ Influenza by 24 months	59.9 ± 6.8	64.9 ± 6.5	60.7 ± 1.7
Hep B birth dose by 4 days	82.0 ± 5.3	<b>81.6 ± 5.3</b>	<b>86.5 ± 1.2</b>

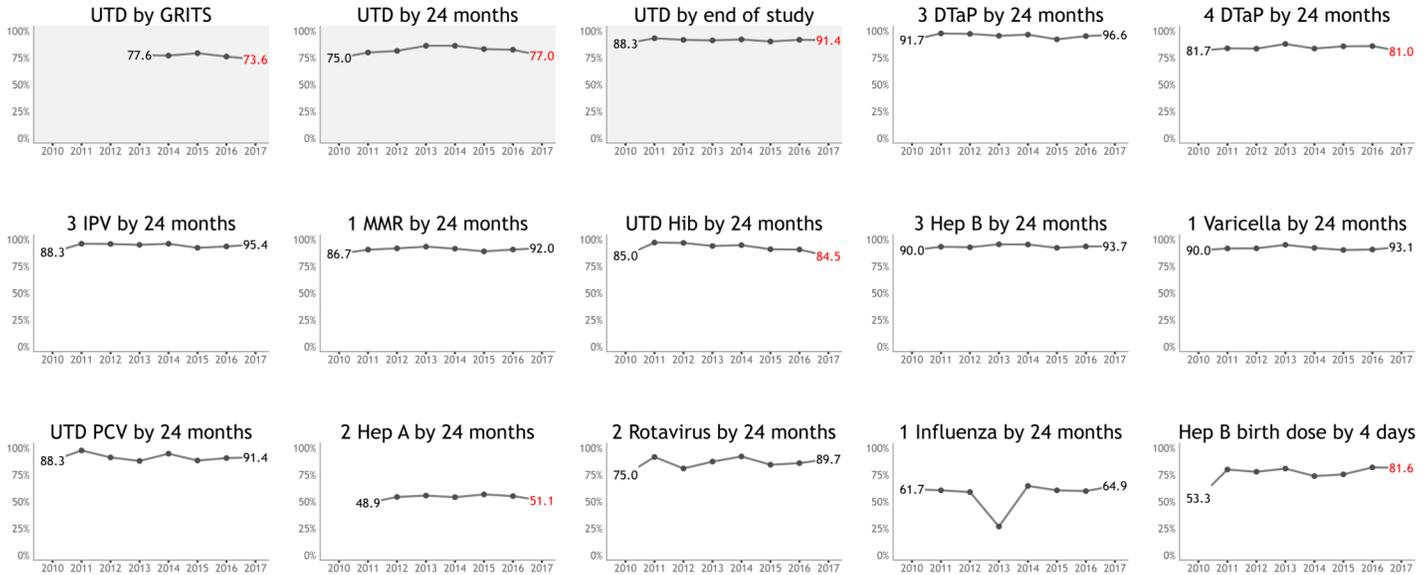
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 3-4-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-4, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 3-4 sample (and all District 3-4 births in 2015), 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 between the demographic subgroups in District 3-4.

**Table 3-4-C: District 3-4 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-4 Sample ‡ n = 174	All 2015 births ‡ N = 14,081	GRITS alone n = 174 (%)	24 months n = 174 (%)	End of study n = 174 (%)
Mother's race*	White	103 (59.2%)	7742 (55.0%)	73.8 ± 7.8	78.6 ± 7.3	92.2 ± 4.8
	Black	49 (28.2%)	4422 (31.4%)	71.4 ± 12.0	71.4 ± 12.0	85.7 ± 9.0
	Asian	14 (8.1%)	1227 (8.7%)	71.4 ± 22.0	78.6 ± 20.0	100.0 ± 0.0
	Other	8 (4.6%)	690 (4.9%)	87.5 ± 21.0	87.5 ± 21.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	127 (73.0%)	10028 (71.2%)	73.2 ± 7.1	76.4 ± 6.8	90.6 ± 4.7
	Hispanic	47 (27.0%)	3705 (26.3%)	74.5 ± 11.0	78.7 ± 11.0	93.6 ± 6.4
Mother's age*	<25 years old	44 (25.3%)	3320 (23.6%)	68.2 ± 13.0	70.5 ± 12.0	88.6 ± 8.6
	25 - 35 years old	93 (53.4%)	7926 (56.3%)	75.3 ± 8.1	80.6 ± 7.4	93.5 ± 4.6
	35+ years old	37 (21.3%)	2835 (20.1%)	75.7 ± 13.0	75.7 ± 13.0	89.2 ± 9.2
Mother's education*	Some college or higher	87 (50.0%)	8077 (57.4%)	75.9 ± 8.3	79.3 ± 7.8	93.1 ± 4.9
	High School Graduate/GED	56 (32.2%)	3836 (27.2%)	80.4 ± 9.6	82.1 ± 9.2	89.3 ± 7.5
	9th - 11th grade	14 (8.1%)	982 (7.0%)	50.0 ± 24.0	57.1 ± 24.0	85.7 ± 17.0
	<9th grade	11 (6.3%)	683 (4.8%)	81.8 ± 21.0	90.9 ± 16.0	100.0 ± 0.0
Marital status*	Married	102 (58.6%)	8380 (59.5%)	73.5 ± 7.9	76.5 ± 7.6	91.2 ± 5.1
	Unmarried	72 (41.4%)	5694 (40.4%)	73.6 ± 9.4	77.8 ± 8.8	91.7 ± 5.9
Child's WIC status	WIC	104 (59.8%)		72.1 ± 7.9	75.0 ± 7.7	91.3 ± 5.0
	Non-WIC	70 (40.2%)		75.7 ± 9.2	80.0 ± 8.6	91.4 ± 6.0
Number of provider(s) visited	One	136 (78.2%)		73.5 ± 6.8	77.9 ± 6.4	92.6 ± 4.0
	Two	31 (17.8%)		83.9 ± 12.0	83.9 ± 12.0	96.8 ± 5.7
	Three or more	3 (1.7%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	153 (87.9%)		75.2 ± 6.3	79.1 ± 5.9	92.8 ± 3.8
	Public	1 (0.6%)		sample size is too small to generate estimates		
	Both	16 (9.2%)		81.2 ± 18.0	81.2 ± 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  
**Bolded and italicized indicate a significant difference**

# District 3-5

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

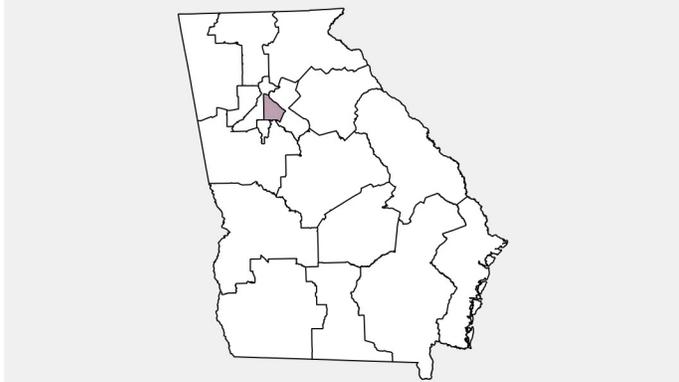


Figure 3-5-B: Sampling per County, District 3-5, 2017



## Final Sample Determination

The original 2017 GIS sample for District 3-5 consisted of 205 children born in January of 2015 (Table 3-5-A). Of these, 8 children were determined to be ineligible for the study. Of those eligible, 42 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 155. 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 2017. Caution should be taken when interpreting immunization rates for a district with a low response rate because children who are unable-to-locate could also be the least UTD.

## Immunization Rates

In District 3-5, the UTD immunization rate by 24 months of age was 87.7%, which was higher than the 2016 rate (77.3%) and the state average (83.6%) (Table 3-5-B). The UTD immunization rate based on GRITS alone was 82.6%, higher than the 2016 rate (69.5%) and the state average (77.9%). The UTD immunization rate by end of data collection was 96.1%, which was higher than the 2016 rate (89.1%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 3-5-B and Figure 3-5-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are italicized and bolded in Table 3-5-B.

## Immunization Administration

Of the 3,143 vaccines doses administered to the District 3-5 cohort, 52 (1.7%) were administered by public health providers and 3,091 (98.3%) were administered by private providers.

Table 3-5-A: GIS Sampling Scheme, District 3-5, 2017

	2016	2017	State 2017
Original sample (n)	237	205	3062
Ineligible (n)	12	8	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	225	197	2853
Unable to locate <sup>†</sup> (n)	5	42	169
Final sample (n)	220	155	2684
Response rate (%)	97.8	78.7	94.1

<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, 2017

	2016 n = 220 (%)	2017 n = 155 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	69.5 ± 5.3	82.6 ± 5.5	77.9 ± 1.4
UTD immunization rate* by 24 months	77.3 ± 4.8	87.7 ± 4.7	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	89.1 ± 3.6	96.1 ± 2.8	92.3 ± 0.9
3 DTaP by 24 months	96.4 ± 2.2	98.7 ± 1.6	95.9 ± 0.7
4 DTaP by 24 months	81.8 ± 4.5	89.7 ± 4.4	85.6 ± 1.2
3 IPV by 24 months	95.0 ± 2.5	97.4 ± 2.3	94.6 ± 0.8
1 MMR by 24 months	91.8 ± 3.2	98.1 ± 2.0	<b>93.4 ± 0.8</b>
UTD Hib by 24 months	88.6 ± 3.7	93.5 ± 3.5	90.3 ± 1.0
3 Hep B by 24 months	96.4 ± 2.2	98.7 ± 1.6	95.8 ± 0.7
1 Varicella by 24 months	91.4 ± 3.2	96.8 ± 2.5	93.3 ± 0.8
UTD PCV by 24 months	90.5 ± 3.4	96.1 ± 2.8	92.4 ± 0.9
2 Hep A by 24 months	60.9 ± 5.6	63.2 ± 6.9	60.8 ± 1.7
2 Rotavirus by 24 months	82.7 ± 4.4	91.6 ± 4.0	87.6 ± 1.1
1+ Influenza by 24 months	62.7 ± 5.6	71.6 ± 6.5	<b>60.7 ± 1.7</b>
Hep B birth dose by 4 days	85.9 ± 4.0	86.5 ± 4.9	86.5 ± 1.2

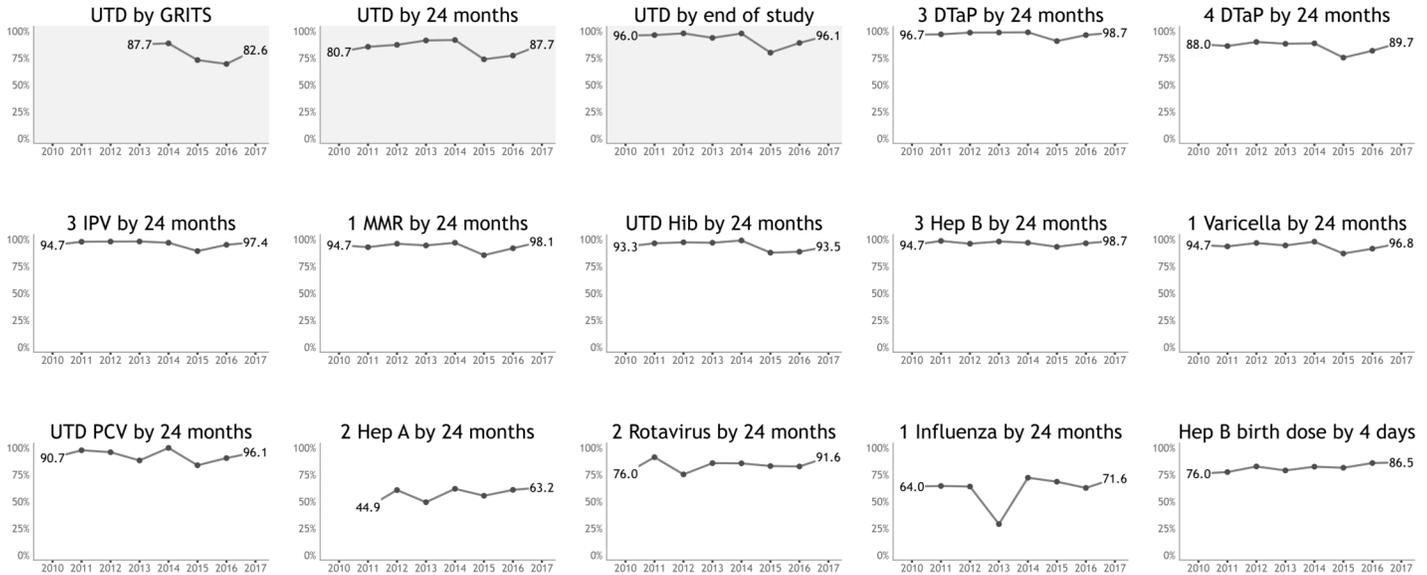
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 3-5-C: Immunization Rates (%) by Series and Vaccine Antigen, District 3-5, 2010-2017



**Demographic Findings**

The demographic breakdown of the District 3-5 sample (and all District 3-5 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 3-5-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 3-5-C.

Table 3-5-C: District 3-5 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		3-5 Sample $n = 155$	All 2015 births $N = 10,979$	GRITS alone $n = 155$ (%)	24 months $n = 155$ (%)	End of study $n = 155$ (%)
Mother's race*	White	52 (33.5%)	3916 (35.7%)	92.3 ± 6.6	<b>100.0 ± 0.0</b>	100.0 ± 0.0
	Black	81 (52.3%)	5390 (49.1%)	72.8 ± 8.9	<b>77.8 ± 8.3</b>	92.6 ± 5.2
	Asian	18 (11.6%)	1070 (9.8%)	94.4 ± 9.7	94.4 ± 9.7	100.0 ± 0.0
	Other	4 (2.6%)	603 (5.5%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	132 (85.2%)	9213 (83.9%)	81.8 ± 6.0	85.6 ± 5.5	95.5 ± 3.2
	Hispanic	23 (14.8%)	1586 (14.4%)	87.0 ± 13.0	100.0 ± 0.0	100.0 ± 0.0
Mother's age*	<25 years old	37 (23.9%)	2627 (23.9%)	70.3 ± 13.0	<b>78.4 ± 12.0</b>	91.9 ± 8.0
	25 - 35 years old	97 (62.6%)	6088 (55.5%)	86.6 ± 6.2	<b>91.8 ± 5.0</b>	97.9 ± 2.6
	35+ years old	21 (13.5%)	2264 (20.6%)	85.7 ± 14.0	85.7 ± 14.0	95.2 ± 8.3
Mother's education*	Some college or higher	79 (51.0%)	6312 (57.5%)	88.6 ± 6.4	91.1 ± 5.7	96.2 ± 3.9
	High School Graduate/GED	50 (32.3%)	2906 (26.5%)	72.0 ± 11.0	84.0 ± 9.3	96.0 ± 5.0
	9th - 11th grade	15 (9.7%)	823 (7.5%)	80.0 ± 18.0	80.0 ± 18.0	93.3 ± 12.0
	<9th grade	9 (5.8%)	733 (6.7%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Marital status*	Married	79 (51.0%)	5883 (53.6%)	89.9 ± 6.1	<b>93.7 ± 4.9</b>	98.7 ± 2.3
	Unmarried	76 (49.0%)	5084 (46.3%)	75.0 ± 8.9	<b>81.6 ± 8.0</b>	93.4 ± 5.1
Child's WIC status	WIC	100 (64.5%)		81.0 ± 7.0	86.0 ± 6.2	97.0 ± 3.1
	Non-WIC	55 (35.5%)		85.5 ± 8.5	90.9 ± 6.9	94.5 ± 5.5
Number of provider(s) visited	One	123 (79.4%)		84.6 ± 5.8	<b>87.8 ± 5.3</b>	95.9 ± 3.2
	Two	29 (18.7%)		79.3 ± 13.0	<b>93.1 ± 8.4</b>	100.0 ± 0.0
	Three or more	3 (1.9%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	143 (92.3%)		83.9 ± 5.5	88.8 ± 4.7	96.5 ± 2.8
	Public					
	Both	12 (7.7%)		66.7 ± 24.0	75.0 ± 22.0	91.7 ± 14.0

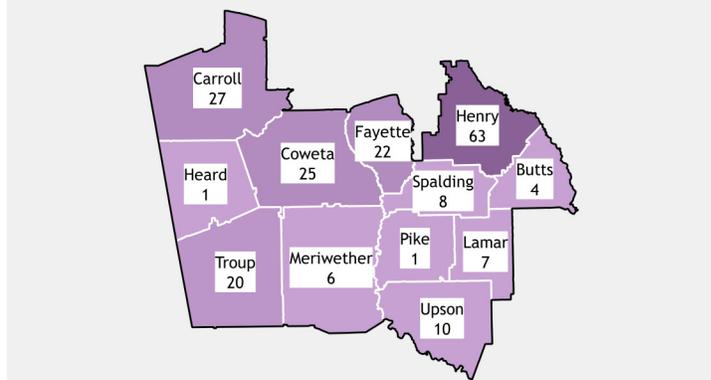
‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 4-0

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



Figure 4-0-B: Sampling per County, District 4-0, 2017



## Final Sample Determination

The original 2017 GIS sample for District 4-0 consisted of 194 children born in January of 2015 (Table 4-A). Of these, 11 children were determined to be ineligible for the study. Of those eligible, 10 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 173. 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 2017.

## Immunization Rates

In District 4-0, the UTD immunization rate by 24 months of age was 86.7%, which was higher than the 2016 rate (81.0%) and the state average (83.6%) (Table 4-0-B). The UTD immunization rate based on GRITS alone was 82.1%, higher than the 2016 rate (76.6%) and the state average (77.9%). The UTD immunization rate by end of data collection was 93.6%, which was higher than the 2016 rate (86.4%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 4-0-B and Figure 4-0-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 4-0-B.

## Immunization Administration

Of the 3,129 vaccines doses administered to the District 4-0 cohort, 139 (4.4%) were administered by public health providers and 2,990 (95.6%) were administered by private providers.

Table 4-0-A: GIS Sampling Scheme, District 4-0, 2017

	2016	2017	State 2017
Original sample (n)	196	194	3062
Ineligible (n)	7	11	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	189	183	2853
Unable to locate <sup>†</sup> (n)	5	10	169
Final sample (n)	184	173	2684
Response rate (%)	97.4	94.5	94.1

<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, 2017

	2016 n = 184 (%)	2017 n = 173 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	76.6 ± 5.4	82.1 ± 5.0	77.9 ± 1.4
UTD immunization rate* by 24 months	81.0 ± 5.0	86.7 ± 4.5	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	<b>86.4 ± 4.4</b>	<b>93.6 ± 3.2</b>	92.3 ± 0.9
3 DTaP by 24 months	94.0 ± 3.0	97.1 ± 2.2	95.9 ± 0.7
4 DTaP by 24 months	84.2 ± 4.6	88.4 ± 4.2	85.6 ± 1.2
3 IPV by 24 months	94.0 ± 3.0	96.0 ± 2.6	94.6 ± 0.8
1 MMR by 24 months	93.5 ± 3.1	<b>93.1 ± 3.3</b>	93.4 ± 0.8
UTD Hib by 24 months	90.8 ± 3.7	91.3 ± 3.7	90.3 ± 1.0
3 Hep B by 24 months	95.1 ± 2.7	96.5 ± 2.4	95.8 ± 0.7
1 Varicella by 24 months	92.4 ± 3.4	93.6 ± 3.2	93.3 ± 0.8
UTD PCV by 24 months	92.4 ± 3.4	92.5 ± 3.5	92.4 ± 0.9
2 Hep A by 24 months	60.9 ± 6.2	<b>60.7 ± 6.4</b>	60.8 ± 1.7
2 Rotavirus by 24 months	85.3 ± 4.5	88.4 ± 4.2	87.6 ± 1.1
1+ Influenza by 24 months	48.9 ± 6.4	53.2 ± 6.5	60.7 ± 1.7
Hep B birth dose by 4 days	85.3 ± 4.5	86.7 ± 4.5	86.5 ± 1.2

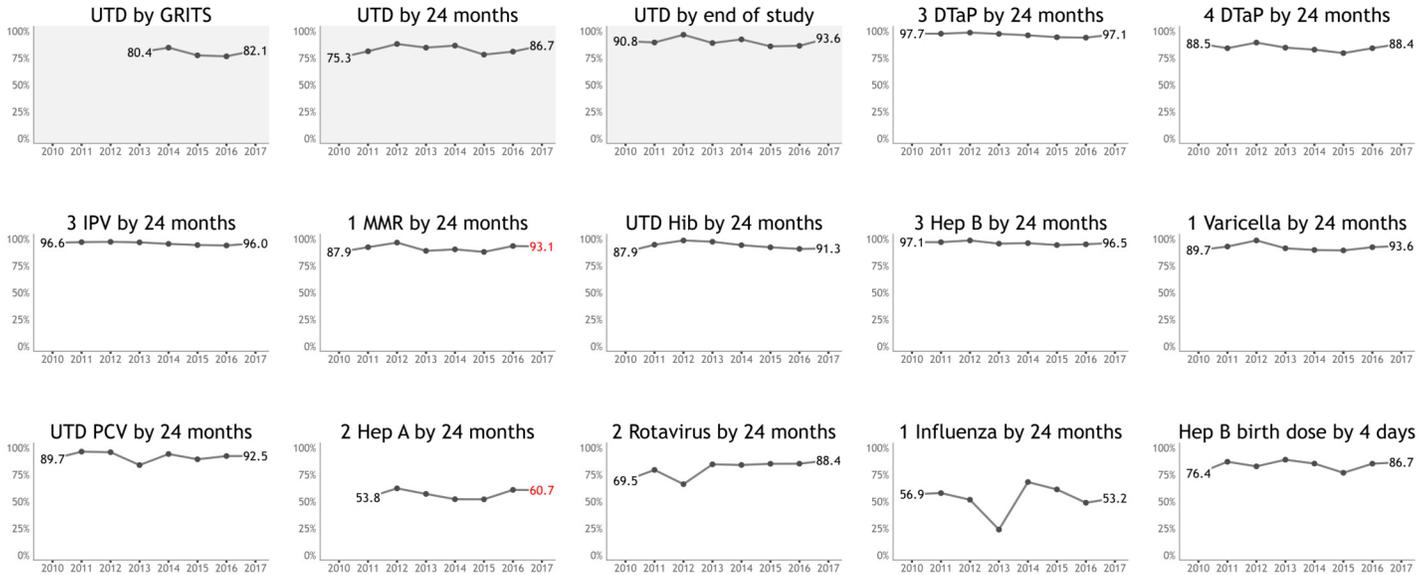
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 4-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 4-0, 2010-2017



**Demographic Findings**

The demographic breakdown of the District 4-0 sample (and all District 4-0 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 4-0-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 4-0-C.

Table 4-0-C: District 4-0 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		4-0 Sample $n = 173$	All 2015 births $N = 9,178$	GRITS alone $n = 173$ (%)	24 months $n = 173$ (%)	End of study $n = 173$ (%)
Mother's race*	White	114 (65.9%)	5774 (62.9%)	79.8 ± 6.5	85.1 ± 5.8	93.0 ± 4.1
	Black	50 (28.9%)	2835 (30.9%)	84.0 ± 8.9	88.0 ± 7.9	94.0 ± 5.8
	Asian	5 (2.9%)	253 (2.8%)	sample size is too small to generate estimates		
	Other	4 (2.3%)	316 (3.4%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	162 (93.6%)	8424 (91.8%)	81.5 ± 5.3	85.8 ± 4.7	93.2 ± 3.4
	Hispanic	11 (6.4%)	630 (6.9%)	90.9 ± 15.0	100.0 ± 0.0	100.0 ± 0.0
Mother's age*	<25 years old	66 (38.2%)	3138 (34.2%)	89.4 ± 6.5	90.9 ± 6.1	93.9 ± 5.1
	25 - 35 years old	93 (53.8%)	4815 (52.5%)	75.3 ± 7.7	82.8 ± 6.8	93.5 ± 4.4
	35+ years old	14 (8.1%)	1225 (13.3%)	92.9 ± 12.0	92.9 ± 12.0	92.9 ± 12.0
Mother's education*	Some college or higher	74 (42.8%)	4804 (52.3%)	83.8 ± 7.4	87.8 ± 6.6	94.6 ± 4.5
	High School Graduate/GED	66 (38.2%)	3006 (32.8%)	84.8 ± 7.6	89.4 ± 6.5	97.0 ± 3.6
	9th - 11th grade	27 (15.6%)	1092 (11.9%)	74.1 ± 15.0	77.8 ± 14.0	81.5 ± 13.0
	<9th grade	5 (2.9%)	167 (1.8%)	sample size is too small to generate estimates		
Marital status*	Married	89 (51.4%)	4921 (53.6%)	83.1 ± 6.8	87.6 ± 6.0	93.3 ± 4.6
	Unmarried	84 (48.6%)	4244 (46.2%)	81.0 ± 7.4	85.7 ± 6.6	94.0 ± 4.5
Child's WIC status	WIC	106 (61.3%)		78.3 ± 6.9	83.0 ± 6.3	92.5 ± 4.4
	Non-WIC	67 (38.7%)		88.1 ± 6.8	92.5 ± 5.5	95.5 ± 4.4
Number of provider(s) visited	One	149 (86.1%)		84.6 ± 5.1	88.6 ± 4.5	94.0 ± 3.4
	Two	23 (13.3%)		69.6 ± 17.0	78.3 ± 15.0	95.7 ± 7.3
	Three or more					
Type of provider(s) visited	Private	154 (89.0%)		85.7 ± 4.9	<b>89.6 ± 4.2</b>	94.2 ± 3.3
	Public	4 (2.3%)		sample size is too small to generate estimates		
	Both	14 (8.1%)		57.1 ± 23.0	<b>64.3 ± 22.0</b>	92.9 ± 12.0

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 5-1

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

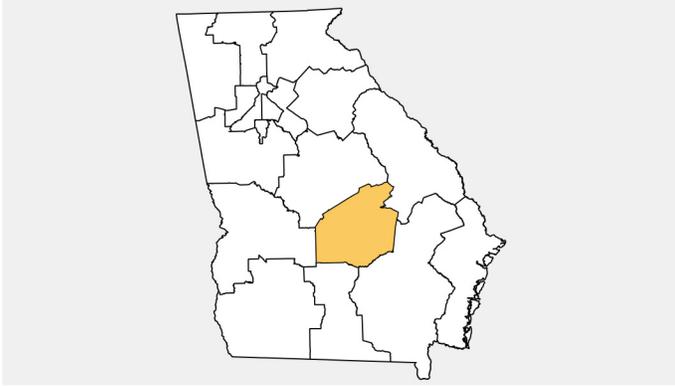
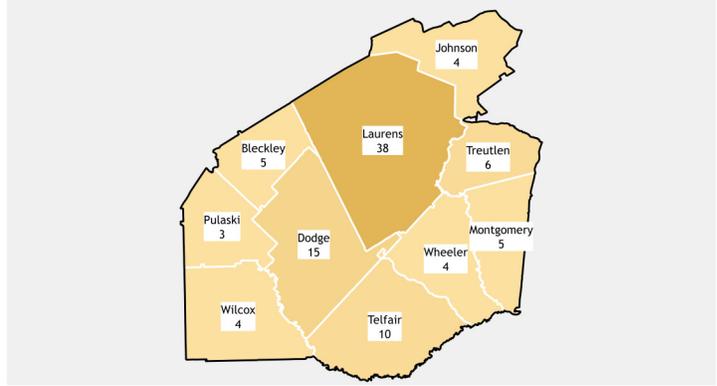


Figure 5-1-B: Sampling per County, District 5-1, 2017



## Final Sample Determination

The original 2017 GIS sample for District 5-1 consisted of 93 children born in January of 2015 (Table 5-1-A). Of these, 4 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 5-1, which was used to calculate all rates, was 81. 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 2017.

## Immunization Rates

In District 5-1, the UTD immunization rate by 24 months of age was 80.2%, which was higher than the 2016 rate (74.7%) and lower than the state average (83.6%) (Table 5-1-B). The UTD immunization rate based on GRITS alone was 75.3%, higher than the 2016 rate (73.3%), and lower than the state average (77.9%). The UTD immunization rate by end of data collection was 95.1%, which was higher than the 2016 rate (86.7%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 5-1-B and Figure 5-1-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 5-1-B.

## Immunization Administration

Of the 1,452 vaccines doses administered to the District 5-1 cohort, 20 (1.4%) were administered by public health providers and 1,432 (98.6%) were administered by private providers.

Table 5-1-A: GIS Sampling Scheme, District 5-1, 2017

	2016	2017	State 2017
Original sample (n)	82	93	3062
Ineligible (n)	6	4	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	76	89	2853
Unable to locate <sup>†</sup> (n)	1	8	169
Final sample (n)	75	81	2684
Response rate (%)	98.7	91.0	94.1

<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, 2017

	2016 n = 75 (%)	2017 n = 81 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	73.3 ± 5.9	75.3 ± 6.2	77.9 ± 1.4
UTD immunization rate* by 24 months	74.7 ± 5.8	80.2 ± 5.7	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	86.7 ± 4.6	95.1 ± 3.1	92.3 ± 0.9
3 DTaP by 24 months	93.3 ± 3.4	97.5 ± 2.2	95.9 ± 0.7
4 DTaP by 24 months	74.7 ± 5.8	81.5 ± 5.6	85.6 ± 1.2
3 IPV by 24 months	93.3 ± 3.4	97.5 ± 2.2	94.6 ± 0.8
1 MMR by 24 months	90.7 ± 3.9	91.4 ± 4.1	93.4 ± 0.8
UTD Hib by 24 months	80.0 ± 5.4	87.7 ± 4.7	90.3 ± 1.0
3 Hep B by 24 months	97.3 ± 2.2	97.5 ± 2.2	95.8 ± 0.7
1 Varicella by 24 months	90.7 ± 3.9	91.4 ± 4.1	93.3 ± 0.8
UTD PCV by 24 months	85.3 ± 4.8	92.6 ± 3.8	92.4 ± 0.9
2 Hep A by 24 months	54.7 ± 6.7	<b>53.1 ± 7.2</b>	60.8 ± 1.7
2 Rotavirus by 24 months	88.0 ± 4.4	91.4 ± 4.1	87.6 ± 1.1
1+ Influenza by 24 months	46.7 ± 6.7	<b>58.0 ± 7.1</b>	60.7 ± 1.7
Hep B birth dose by 4 days	96.0 ± 2.6	96.3 ± 2.7	<b>86.5 ± 1.2</b>

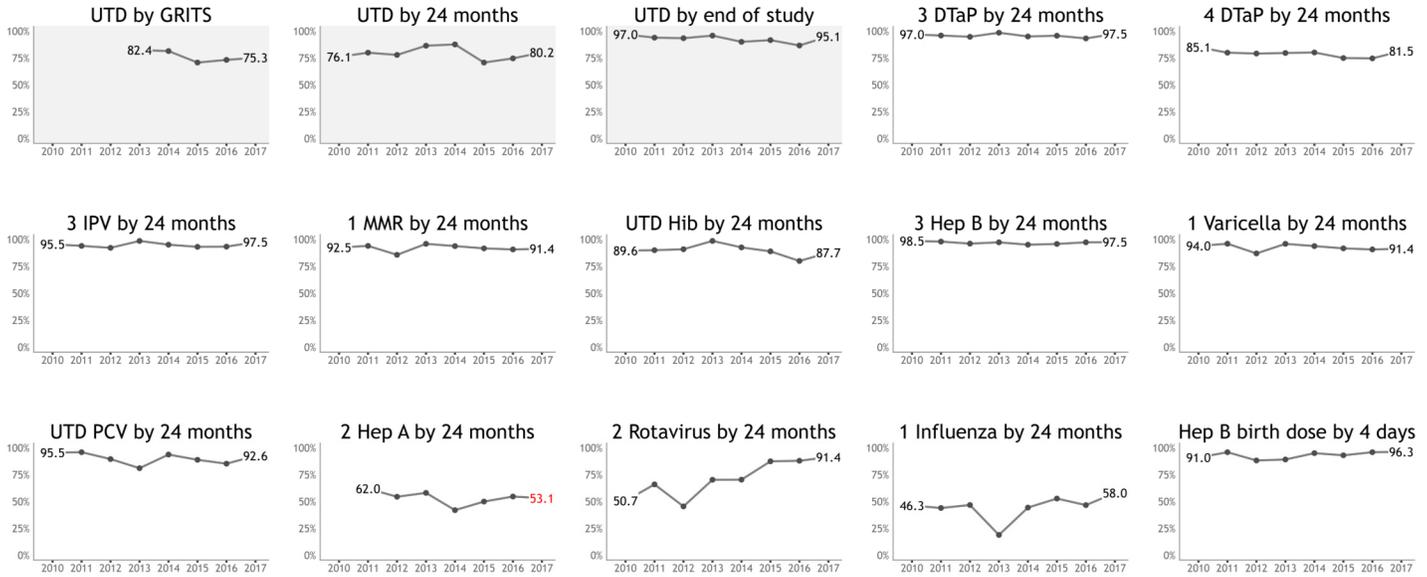
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 5-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 5-1, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 5-1 sample (and all District 5-1 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 5-1-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 5-1-C.

**Table 5-1-C: District 5-1 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		5-1 Sample $n = 81$	All 2015 births $N = 1,548$	GRITS alone $n = 81$ (%)	24 months $n = 81$ (%)	End of study $n = 81$ (%)
Mother's race*	White	52 (64.2%)	922 (59.6%)	84.6 ± 6.5	<b>90.4 ± 5.3</b>	98.1 ± 2.5
	Black	26 (32.1%)	585 (37.8%)	61.5 ± 12.0	<b>65.4 ± 12.0</b>	92.3 ± 6.8
	Asian	2 (2.5%)	19 (1.2%)	sample size is too small to generate estimates		
	Other	1 (1.2%)	22 (1.4%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	80 (98.8%)	1487 (96.1%)	75.0 ± 6.3	80.0 ± 5.8	95.0 ± 3.2
	Hispanic	1 (1.2%)	58 (3.8%)	sample size is too small to generate estimates		
Mother's age*	<25 years old	41 (50.6%)	676 (43.7%)	70.7 ± 9.2	75.6 ± 8.7	95.1 ± 4.4
	25 - 35 years old	36 (44.4%)	741 (47.9%)	77.8 ± 9.0	83.3 ± 8.1	94.4 ± 5.0
	35+ years old	4 (4.9%)	131 (8.5%)	sample size is too small to generate estimates		
Mother's education*	Some college or higher	36 (44.4%)	656 (42.4%)	80.6 ± 8.6	88.9 ± 6.8	94.4 ± 5.0
	High School Graduate/GED	21 (25.9%)	565 (36.5%)	81.0 ± 11.0	81.0 ± 11.0	100.0 ± 0.0
	9th - 11th grade	21 (25.9%)	259 (16.7%)	61.9 ± 14.0	66.7 ± 13.0	95.2 ± 6.0
	<9th grade	2 (2.5%)	53 (3.4%)	sample size is too small to generate estimates		
Marital status*	Married	41 (50.6%)	714 (46.1%)	80.5 ± 8.0	85.4 ± 7.2	95.1 ± 4.4
	Unmarried	40 (49.4%)	829 (53.6%)	70.0 ± 9.4	75.0 ± 8.9	95.0 ± 4.5
Child's WIC status	WIC	55 (67.9%)		74.5 ± 7.6	76.4 ± 7.4	92.7 ± 4.5
	Non-WIC	26 (32.1%)		76.9 ± 11.0	88.5 ± 8.1	100.0 ± 0.0
Number of provider(s) visited	One	61 (75.3%)		75.4 ± 7.2	80.3 ± 6.6	95.1 ± 3.6
	Two	19 (23.5%)		73.7 ± 13.0	78.9 ± 12.0	94.7 ± 6.7
	Three or more	1 (1.2%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	79 (97.5%)		75.9 ± 6.2	79.7 ± 5.9	94.9 ± 3.2
	Public					
	Both	2 (2.5%)		sample size is too small to generate estimates		

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 5-2

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

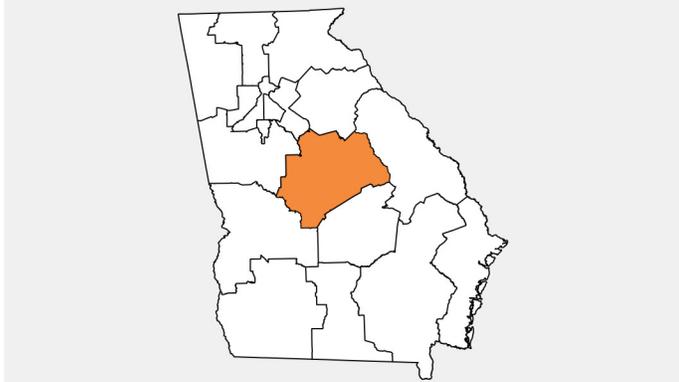
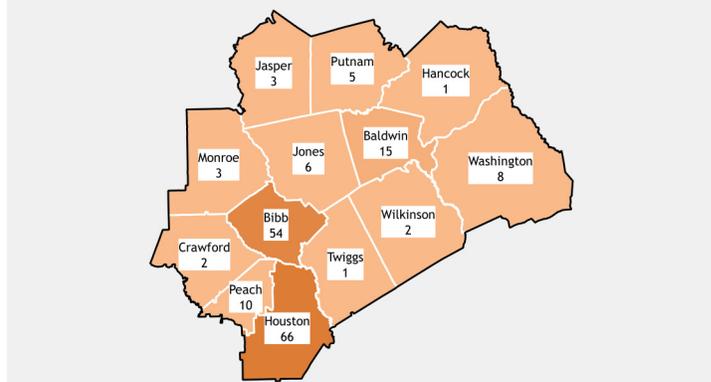


Figure 5-2-B: Sampling per County, District 5-2, 2017



## Final Sample Determination

The original 2017 GIS sample for District 5-2 consisted of 176 children born in January of 2015 (Table 5-2-A). Of these, 6 children were determined to be ineligible for the study. Of those eligible, 6 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 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 higher response rate was achieved in 2017.

## Immunization Rates

In District 5-2, the UTD immunization rate by 24 months of age was 81.7%, which was higher than the 2016 rate (81.3%) and lower than the state average (83.6%) (Table 5-2-B). The UTD immunization rate based on GRITS alone was 76.8%, higher than the 2016 rate (72.4%), and lower than the state average (77.9%). The UTD immunization rate by end of data collection was 89.6%, which was higher than the 2016 rate (86.2%), and lower than the state average (92.3%).

Most 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 2017 are shown as **red** in Table 5-2-B and Figure 5-2-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 5-2-B.

## Immunization Administration

Of the 2,991 vaccines doses administered to the District 5-2 cohort, 107 (3.6%) were administered by public health providers and 2,884 (96.4%) were administered by private providers.

Table 5-2-A: GIS Sampling Scheme, District 5-2, 2017

	2016	2017	State 2017
Original sample (n)	138	176	3062
Ineligible (n)	10	6	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	128	170	2853
Unable to locate <sup>†</sup> (n)	5	6	169
Final sample (n)	123	164	2684
Response rate (%)	96.1	96.5	94.1

<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, 2017

	2016 n = 123 (%)	2017 n = 164 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	72.4 ± 7.0	76.8 ± 5.4	77.9 ± 1.4
UTD immunization rate* by 24 months	81.3 ± 6.1	81.7 ± 5.0	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	86.2 ± 5.4	89.6 ± 3.9	92.3 ± 0.9
3 DTaP by 24 months	95.9 ± 3.1	97.0 ± 2.2	95.9 ± 0.7
4 DTaP by 24 months	83.7 ± 5.8	<b>82.9 ± 4.8</b>	85.6 ± 1.2
3 IPV by 24 months	95.9 ± 3.1	<b>95.7 ± 2.6</b>	94.6 ± 0.8
1 MMR by 24 months	91.9 ± 4.3	<b>91.5 ± 3.6</b>	93.4 ± 0.8
UTD Hib by 24 months	90.2 ± 4.6	<b>88.4 ± 4.1</b>	90.3 ± 1.0
3 Hep B by 24 months	94.3 ± 3.6	95.7 ± 2.6	95.8 ± 0.7
1 Varicella by 24 months	91.9 ± 4.3	<b>90.2 ± 3.8</b>	93.3 ± 0.8
UTD PCV by 24 months	90.2 ± 4.6	90.9 ± 3.7	92.4 ± 0.9
2 Hep A by 24 months	65.9 ± 7.4	<b>62.2 ± 6.2</b>	60.8 ± 1.7
2 Rotavirus by 24 months	82.9 ± 5.9	86.6 ± 4.4	87.6 ± 1.1
1+ Influenza by 24 months	52.8 ± 7.8	59.8 ± 6.3	60.7 ± 1.7
Hep B birth dose by 4 days	92.7 ± 4.1	94.5 ± 2.9	<b>86.5 ± 1.2</b>

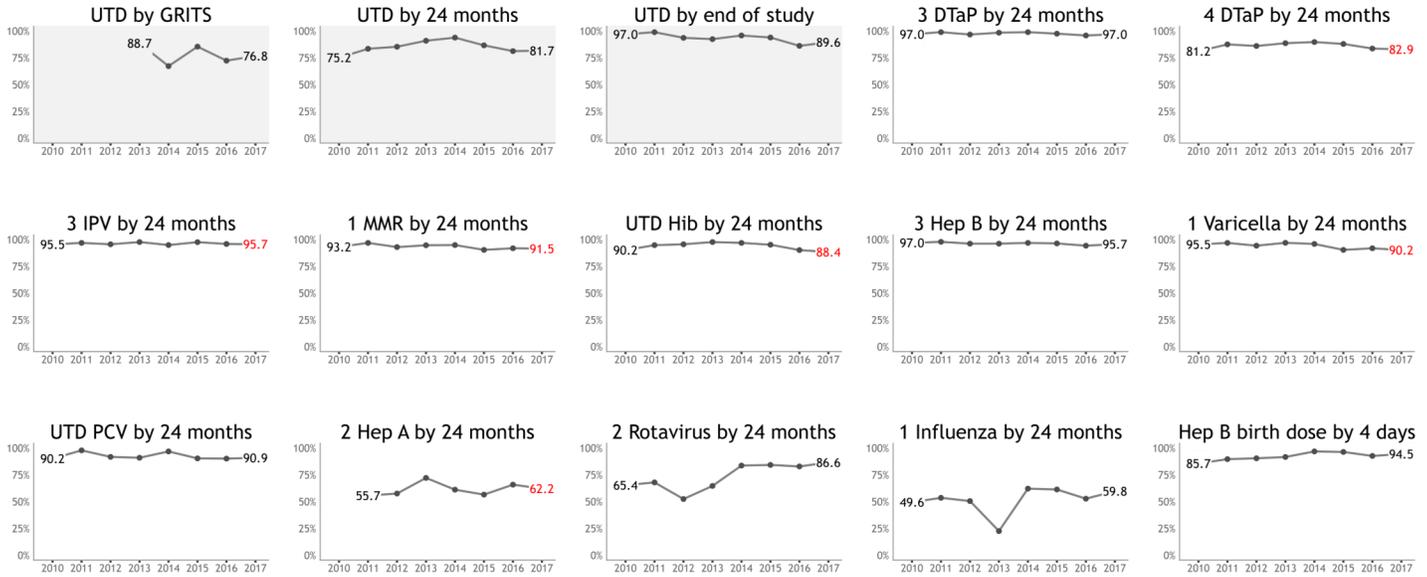
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 5-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 5-2, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 5-2 sample (and all District 5-2 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 5-2-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 5-2-C.

**Table 5-2-C: District 5-2 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		5-2 Sample $n = 164$	All 2015 births $N = 6,426$	GRITS alone $n = 164$ (%)	24 months $n = 164$ (%)	End of study $n = 164$ (%)
Mother's race*	White	83 (50.6%)	3121 (48.6%)	71.1 ± 8.2	78.3 ± 7.4	86.7 ± 6.1
	Black	73 (44.5%)	2986 (46.5%)	80.8 ± 7.6	83.6 ± 7.1	91.8 ± 5.3
	Asian	4 (2.4%)	129 (2.0%)	sample size is too small to generate estimates		
	Other	4 (2.4%)	190 (3.0%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	155 (94.5%)	6006 (93.5%)	77.4 ± 5.5	81.9 ± 5.1	90.3 ± 3.9
	Hispanic	9 (5.5%)	384 (6.0%)	66.7 ± 26.0	77.8 ± 23.0	77.8 ± 23.0
Mother's age*	<25 years old	61 (37.2%)	2330 (36.3%)	70.5 ± 9.6	78.7 ± 8.6	90.2 ± 6.3
	25 - 35 years old	81 (49.4%)	3376 (52.5%)	77.8 ± 7.6	80.2 ± 7.3	86.4 ± 6.3
	35+ years old	22 (13.4%)	720 (11.2%)	90.9 ± 10.0	95.5 ± 7.3	100.0 ± 0.0
Mother's education*	Some college or higher	83 (50.6%)	3311 (51.5%)	81.9 ± 7.0	85.5 ± 6.4	91.6 ± 5.0
	High School Graduate/GED	49 (29.9%)	2039 (31.7%)	71.4 ± 11.0	77.6 ± 9.8	87.8 ± 7.7
	9th - 11th grade	27 (16.5%)	893 (13.9%)	70.4 ± 14.0	77.8 ± 13.0	88.9 ± 10.0
	<9th grade	5 (3.0%)	153 (2.4%)	sample size is too small to generate estimates		
Marital status*	Married	72 (43.9%)	2915 (45.4%)	84.7 ± 7.0	<b>88.9 ± 6.1</b>	91.7 ± 5.4
	Unmarried	92 (56.1%)	3508 (54.6%)	70.7 ± 7.8	<b>76.1 ± 7.3</b>	88.0 ± 5.6
Child's WIC status	WIC	109 (66.5%)		73.4 ± 7.0	78.0 ± 6.5	89.0 ± 4.9
	Non-WIC	55 (33.5%)		83.6 ± 8.2	89.1 ± 6.9	90.9 ± 6.4
Number of provider(s) visited	One	136 (82.9%)		79.4 ± 5.7	84.6 ± 5.1	90.4 ± 4.2
	Two	25 (15.2%)		68.0 ± 15.0	72.0 ± 15.0	88.0 ± 11.0
	Three or more	1 (0.6%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	146 (89.0%)		79.5 ± 5.5	<b>84.9 ± 4.9</b>	91.1 ± 3.9
	Public	1 (0.6%)		sample size is too small to generate estimates		
	Both	15 (9.2%)		53.3 ± 21.0	<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  
**Bolded and italicized indicate a significant difference**

# District 6-0

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

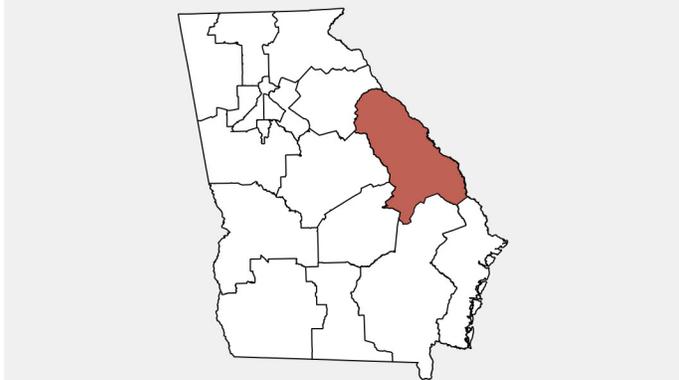
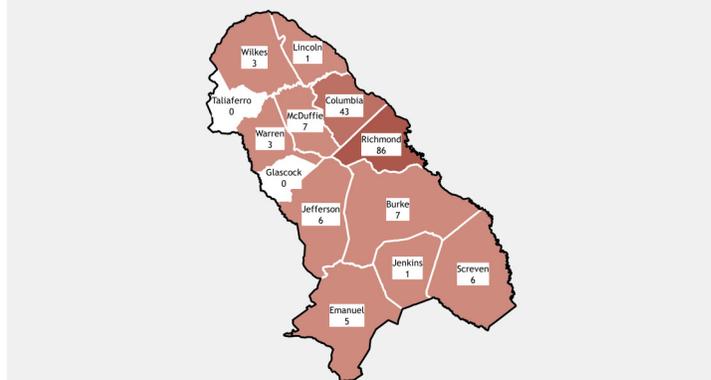


Figure 6-0-B: Sampling per County, District 6-0, 2017



## Final Sample Determination

The original 2017 GIS sample for District 6-0 consisted of 168 children born in January of 2015 (Table 6-0-A). Of these, 18 children were determined to be ineligible for the study. Of those eligible, 6 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 144. 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 2017.

## Immunization Rates

In District 6-0, the UTD immunization rate by 24 months of age was 91.0%, which was higher than the 2016 rate (79.3%) and the state average (83.6%) (Table 6-0-B). The UTD immunization rate based on GRITS alone was 87.5%, higher than the 2016 rate (75.7%) and the state average (77.9%). The UTD immunization rate by end of data collection was 96.5%, which was higher than the 2016 rate (92.1%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 6-0-B and Figure 6-0-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 6-0-B.

## Immunization Administration

Of the 2,778 vaccine doses administered to the District 6-0 cohort, 57 (2.1%) were administered by public health providers and 2,721 (97.9%) were administered by private providers.

Table 6-0-A: GIS Sampling Scheme, District 6-0, 2017

	2016	2017	State 2017
Original sample (n)	152	168	3062
Ineligible (n)	9	18	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	143	150	2853
Unable to locate <sup>†</sup> (n)	3	6	169
Final sample (n)	140	144	2684
Response rate (%)	97.9	96.0	94.1

<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, 2017

	2016 n = 140 (%)	2017 n = 144 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	75.7 ± 6.1	87.5 ± 4.6	77.9 ± 1.4
UTD immunization rate* by 24 months	79.3 ± 5.8	91.0 ± 4.0	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	92.1 ± 3.9	96.5 ± 2.6	92.3 ± 0.9
3 DTaP by 24 months	95.7 ± 2.9	97.2 ± 2.3	95.9 ± 0.7
4 DTaP by 24 months	80.7 ± 5.7	92.4 ± 3.7	85.6 ± 1.2
3 IPV by 24 months	95.7 ± 2.9	96.5 ± 2.6	94.6 ± 0.8
1 MMR by 24 months	90.7 ± 4.2	96.5 ± 2.6	93.4 ± 0.8
UTD Hib by 24 months	86.4 ± 4.9	92.4 ± 3.7	90.3 ± 1.0
3 Hep B by 24 months	99.3 ± 1.2	<b>97.2 ± 2.3</b>	95.8 ± 0.7
1 Varicella by 24 months	93.6 ± 3.5	96.5 ± 2.6	93.3 ± 0.8
UTD PCV by 24 months	87.9 ± 4.7	95.1 ± 3.0	92.4 ± 0.9
2 Hep A by 24 months	54.3 ± 7.1	66.0 ± 6.6	60.8 ± 1.7
2 Rotavirus by 24 months	87.1 ± 4.8	93.8 ± 3.4	<b>87.6 ± 1.1</b>
1+ Influenza by 24 months	65.0 ± 6.8	<b>64.6 ± 6.7</b>	60.7 ± 1.7
Hep B birth dose by 4 days	82.9 ± 5.4	88.2 ± 4.5	86.5 ± 1.2

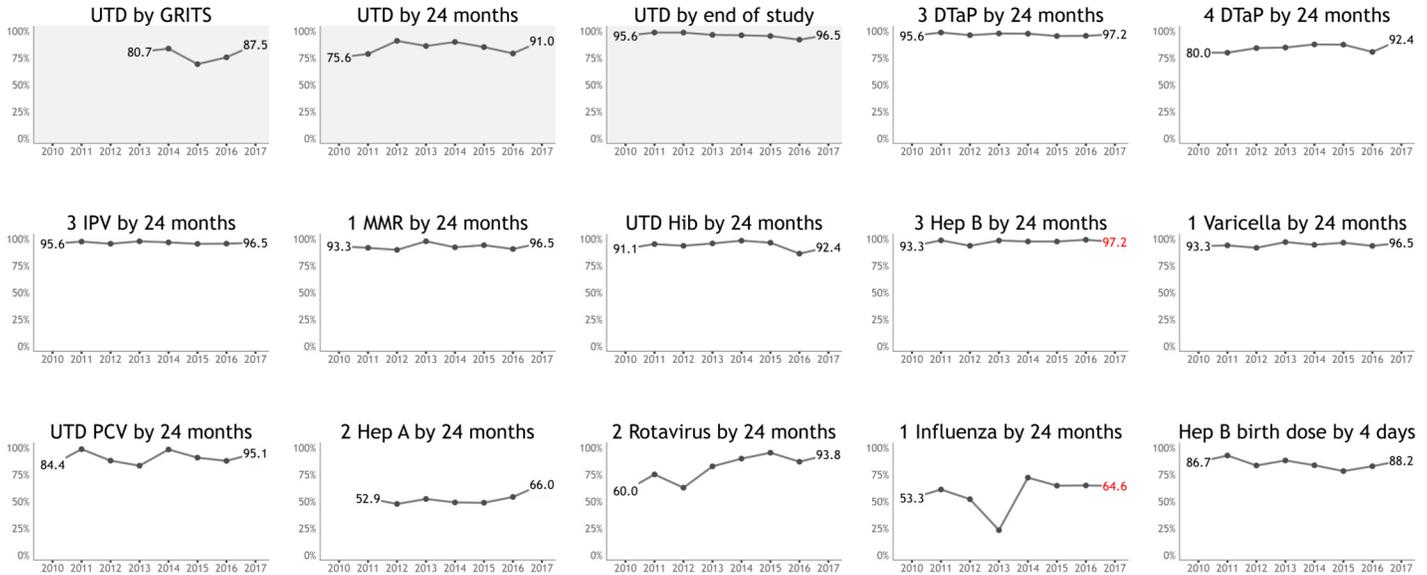
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

**Figure 6-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 6-0, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 6-0 sample (and all District 6-0 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 6-0-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found between the demographic subgroups in District 6-0.

**Table 6-0-C: District 6-0 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		6-0 Sample ‡ n = 144	All 2015 births ‡ N = 6,224	GRITS alone n = 144 (%)	24 months n = 144 (%)	End of study n = 144 (%)
Mother's race*	White	71 (49.3%)	3153 (50.7%)	90.1 ± 5.9	91.5 ± 5.5	95.8 ± 4.0
	Black	66 (45.8%)	2702 (43.4%)	83.3 ± 7.7	89.4 ± 6.3	97.0 ± 3.5
	Asian	2 (1.4%)	141 (2.3%)	sample size is too small to generate estimates		
	Other	5 (3.5%)	228 (3.7%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	143 (99.3%)	5869 (94.3%)	88.1 ± 4.5	91.6 ± 3.9	97.2 ± 2.3
	Hispanic	1 (0.7%)	308 (5.0%)	sample size is too small to generate estimates		
Mother's age*	<25 years old	54 (37.5%)	2156 (34.6%)	87.0 ± 7.7	90.7 ± 6.6	96.3 ± 4.3
	25 - 35 years old	71 (49.3%)	3392 (54.5%)	90.1 ± 5.9	93.0 ± 5.1	97.2 ± 3.3
	35+ years old	19 (13.2%)	676 (10.9%)	78.9 ± 16.0	84.2 ± 14.0	94.7 ± 8.6
Mother's education*	Some college or higher	77 (53.5%)	3500 (56.2%)	90.9 ± 5.5	94.8 ± 4.2	97.4 ± 3.0
	High School Graduate/GED	53 (36.8%)	1821 (29.3%)	83.0 ± 8.6	86.8 ± 7.8	96.2 ± 4.4
	9th - 11th grade	12 (8.3%)	744 (12.0%)	83.3 ± 18.0	83.3 ± 18.0	91.7 ± 13.0
	<9th grade	2 (1.4%)	134 (2.1%)	sample size is too small to generate estimates		
Marital status*	Married	67 (46.5%)	3120 (50.1%)	91.0 ± 5.8	91.0 ± 5.8	97.0 ± 3.5
	Unmarried	77 (53.5%)	3103 (49.9%)	84.4 ± 6.9	90.9 ± 5.5	96.1 ± 3.7
Child's WIC status	WIC	86 (59.7%)		87.2 ± 6.0	90.7 ± 5.2	97.7 ± 2.7
	Non-WIC	58 (40.3%)		87.9 ± 7.2	91.4 ± 6.2	94.8 ± 4.9
Number of provider(s) visited	One	103 (71.5%)		90.3 ± 4.9	92.2 ± 4.4	98.1 ± 2.3
	Two	37 (25.7%)		86.5 ± 9.4	94.6 ± 6.2	100.0 ± 0.0
	Three or more	1 (0.7%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	130 (90.3%)		90.8 ± 4.3	93.8 ± 3.5	98.5 ± 1.8
	Public					
	Both	11 (7.6%)		72.7 ± 22.0	81.8 ± 19.0	100.0 ± 0.0

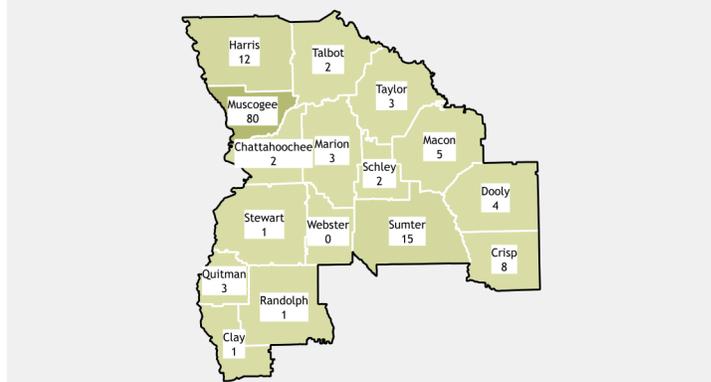
‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 7-0

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



Figure 7-0-B: Sampling per County, District 7-0, 2017



## Final Sample Determination

The original 2017 GIS sample for District 7-0 consisted of 142 children born in January of 2015 (Table 7-0-A). Of these, 13 children were determined to be ineligible for the study. Of those eligible, 6 children were unable to be located and were therefore excluded. The final sample size for District 7-0, 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 2017.

## Immunization Rates

In District 7-0, the UTD immunization rate by 24 months of age was 87.8%, which was lower than the 2016 rate (89.2%) and higher than the state average (83.6%) (Table 7-0-B). The UTD immunization rate based on GRITS alone was 78.0%, lower than the 2016 rate (79.4%), and higher than the state average (77.9%). The UTD immunization rate by end of data collection was 94.3%, which was lower than the 2016 rate (96.1%), and higher than the state average (92.3%).

Most 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 2017 are shown as red in Table 7-0-B and Figure 7-0-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 7-0-B.

## Immunization Administration

Of the 2,416 vaccines doses administered to the District 7-0 cohort, 158 (6.5%) were administered by public health providers and 2,258 (93.5%) were administered by private providers.

Table 7-0-A: GIS Sampling Scheme, District 7-0, 2017

	2016	2017	State 2017
Original sample (n)	129	142	3062
Ineligible (n)	27	13	209
(Refused to participate) (n)	1	1	16
Eligible sample (n)	102	129	2853
Unable to locate <sup>†</sup> (n)	0	6	169
Final sample (n)	102	123	2684
Response rate (%)	100.0	95.3	94.1

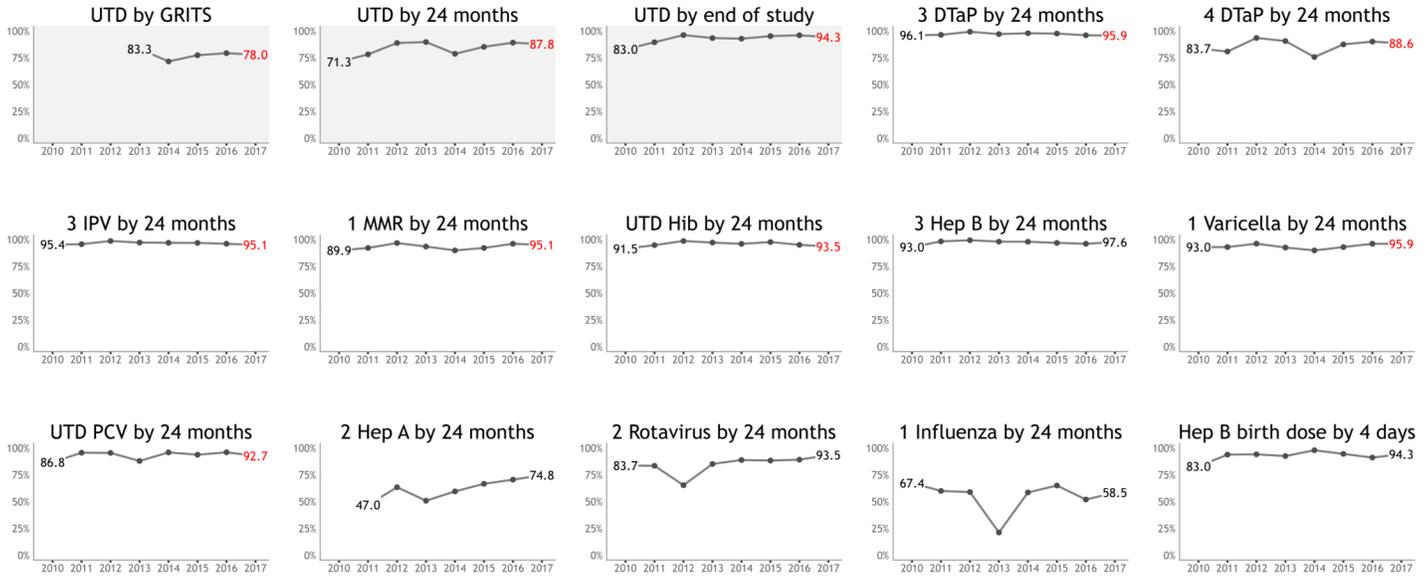
<sup>†</sup> Children were classified as “Unable to Locate” if every conceivable effort was made to locate and communicate with the child’s guardian and the child’s provider was either unknown or also unable to locate the guardian

Table 7-0-B: Immunization Rates by Series and Vaccine Antigen, District 7-0, 2017

	2016 n = 102 (%)	2017 n = 123 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	79.4 ± 6.7	<b>78.0 ± 5.8</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	89.2 ± 5.1	<b>87.8 ± 4.6</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection†	96.1 ± 3.2	<b>94.3 ± 3.3</b>	92.3 ± 0.9
3 DTaP by 24 months	96.1 ± 3.2	<b>95.9 ± 2.8</b>	95.9 ± 0.7
4 DTaP by 24 months	90.2 ± 4.9	<b>88.6 ± 4.5</b>	85.6 ± 1.2
3 IPV by 24 months	96.1 ± 3.2	<b>95.1 ± 3.0</b>	94.6 ± 0.8
1 MMR by 24 months	96.1 ± 3.2	<b>95.1 ± 3.0</b>	93.4 ± 0.8
UTD Hib by 24 months	95.1 ± 3.6	<b>93.5 ± 3.5</b>	90.3 ± 1.0
3 Hep B by 24 months	96.1 ± 3.2	<b>97.6 ± 2.2</b>	95.8 ± 0.7
1 Varicella by 24 months	96.1 ± 3.2	<b>95.9 ± 2.8</b>	93.3 ± 0.8
UTD PCV by 24 months	96.1 ± 3.2	<b>92.7 ± 3.7</b>	92.4 ± 0.9
2 Hep A by 24 months	70.6 ± 7.5	<b>74.8 ± 6.1</b>	<b>60.8 ± 1.7</b>
2 Rotavirus by 24 months	89.2 ± 5.1	<b>93.5 ± 3.5</b>	87.6 ± 1.1
1+ Influenza by 24 months	52.0 ± 8.3	<b>58.5 ± 6.9</b>	60.7 ± 1.7
Hep B birth dose by 4 days	91.2 ± 4.7	<b>94.3 ± 3.3</b>	<b>86.5 ± 1.2</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 2016  
 Italicized and bolded font indicate a significant difference with 2017 rate

Figure 7-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 7-0, 2010-2017



**Demographic Findings**

The demographic breakdown of the District 7-0 sample (and all District 7-0 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 7-0-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 7-0-C.

Table 7-0-C: District 7-0 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		7-0 Sample $n = 123$	All 2015 births $N = 4,190$	GRITS alone $n = 123$ (%)	24 months $n = 123$ (%)	End of study $n = 123$ (%)
Mother's race*	White	50 (40.7%)	1770 (42.2%)	74.0 ± 9.7	92.0 ± 6.0	100.0 ± 0.0
	Black	65 (52.8%)	2178 (52.0%)	81.5 ± 7.5	84.6 ± 7.0	89.2 ± 6.0
	Asian	4 (3.2%)	77 (1.8%)	sample size is too small to generate estimates		
	Other	4 (3.2%)	165 (3.9%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	113 (91.9%)	3847 (91.8%)	79.6 ± 5.9	88.5 ± 4.7	93.8 ± 3.5
	Hispanic	10 (8.1%)	324 (7.7%)	60.0 ± 24.0	80.0 ± 20.0	100.0 ± 0.0
Mother's age*	<25 years old	55 (44.7%)	1770 (42.2%)	80.0 ± 8.4	83.6 ± 7.8	90.9 ± 6.1
	25 - 35 years old	56 (45.5%)	2032 (48.5%)	76.8 ± 8.8	91.1 ± 6.0	96.4 ± 3.9
	35+ years old	12 (9.8%)	388 (9.3%)	75.0 ± 20.0	91.7 ± 12.0	100.0 ± 0.0
Mother's education*	Some college or higher	67 (54.5%)	2003 (47.8%)	82.1 ± 7.3	<b>92.5 ± 5.0</b>	98.5 ± 2.3
	High School Graduate/GED	34 (27.6%)	1357 (32.4%)	79.4 ± 11.0	85.3 ± 9.5	91.2 ± 7.6
	9th - 11th grade	19 (15.4%)	651 (15.5%)	63.2 ± 17.0	<b>73.7 ± 16.0</b>	84.2 ± 13.0
	<9th grade	3 (2.4%)	159 (3.8%)	sample size is too small to generate estimates		
Marital status*	Married	48 (39.0%)	1714 (40.9%)	77.1 ± 9.5	93.8 ± 5.5	100.0 ± 0.0
	Unmarried	75 (61.0%)	2471 (59.0%)	78.7 ± 7.4	84.0 ± 6.6	90.7 ± 5.2
Child's WIC status	WIC	93 (75.6%)		80.6 ± 6.4	84.9 ± 5.8	92.5 ± 4.3
	Non-WIC	30 (24.4%)		70.0 ± 13.0	96.7 ± 5.1	100.0 ± 0.0
Number of provider(s) visited	One	104 (84.6%)		78.8 ± 6.3	86.5 ± 5.2	93.3 ± 3.8
	Two	19 (15.4%)		73.7 ± 16.0	94.7 ± 8.0	100.0 ± 0.0
	Three or more					
Type of provider(s) visited	Private	110 (89.4%)		80.0 ± 6.0	<b>90.0 ± 4.5</b>	96.4 ± 2.8
	Public	6 (4.9%)		33.3 ± 30.0	<b>50.0 ± 32.0</b>	50.0 ± 32.0
	Both	7 (5.7%)		85.7 ± 21.0	85.7 ± 21.0	100.0 ± 0.0

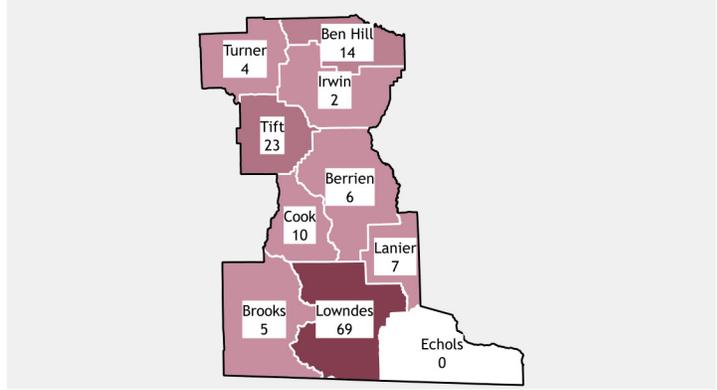
‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 8-1

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



Figure 8-1-B: Sampling per County, District 8-1, 2017



## Final Sample Determination

The original 2017 GIS sample for District 8-1 consisted of 133 children born in January of 2015 (Table 8-1-A). Of these, 1 child was determined to be ineligible for the study. Of those eligible, 9 children were unable to be located and were therefore excluded. The final sample size for District 8-1, 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 2017.

## Immunization Rates

In District 8-1, the UTD immunization rate by 24 months of age was 91.1%, which was lower than the 2016 rate (91.4%) and higher than the state average (83.6%) (Table 8-1-B). The UTD immunization rate based on GRITS alone was 85.4%, lower than the 2016 rate (90.3%), and higher than the state average (77.9%). The UTD immunization rate by end of data collection was 94.3%, which was lower than the 2016 rate (96.8%), and higher than the state average (92.3%).

Most 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 2017 are shown as **red** in Table 8-1-B and Figure 8-1-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 8-1-B.

## Immunization Administration

Of the 2,338 vaccines doses administered to the District 8-1 cohort, 10 (0.4%) were administered by public health providers and 2,328 (99.6%) were administered by private providers.

Table 8-1-A: GIS Sampling Scheme, District 8-1, 2017

	2016	2017	State 2017
Original sample (n)	94	133	3062
Ineligible (n)	1	1	209
(Refused to participate) (n)	1	0	16
Eligible sample (n)	93	132	2853
Unable to locate <sup>†</sup> (n)	0	9	169
Final sample (n)	93	123	2684
Response rate (%)	100.0	93.2	94.1

<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

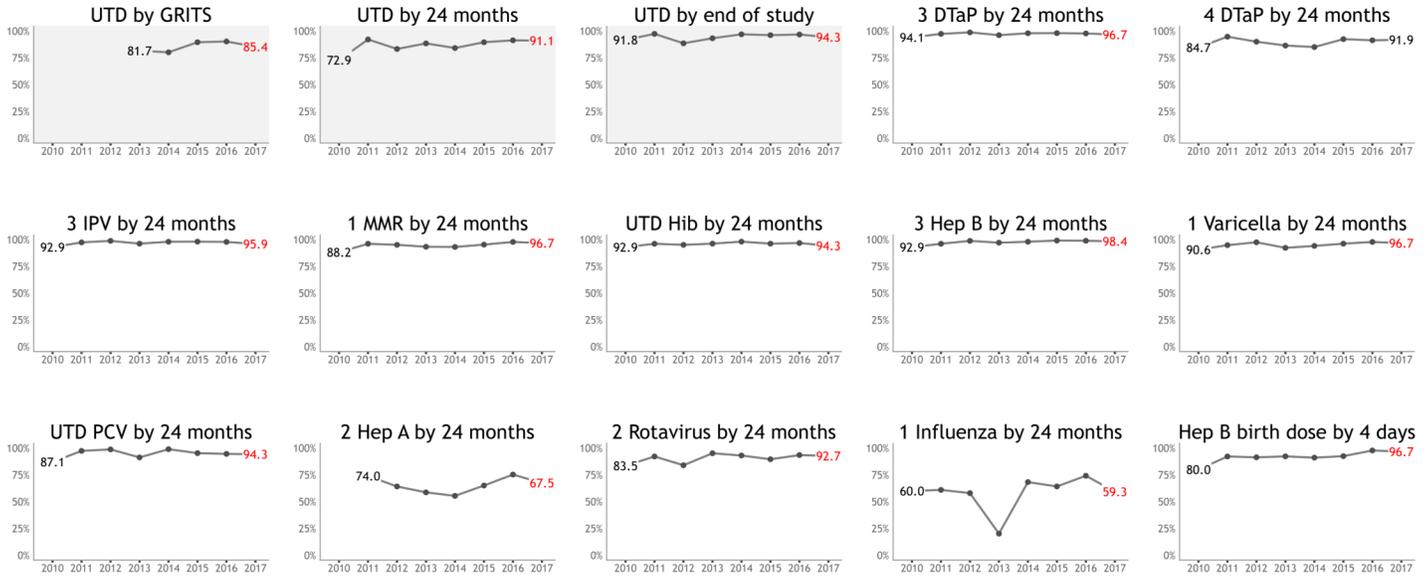
Table 8-1-B: Immunization Rates by Series and Vaccine Antigen, District 8-1, 2017

	2016 n = 93 (%)	2017 n = 123 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	90.3 ± 5.0	<b>85.4 ± 4.9</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	91.4 ± 4.7	<b>91.1 ± 3.9</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection†	96.8 ± 3.0	<b>94.3 ± 3.2</b>	92.3 ± 0.9
3 DTaP by 24 months	97.8 ± 2.4	<b>96.7 ± 2.5</b>	95.9 ± 0.7
4 DTaP by 24 months	91.4 ± 4.7	<b>91.9 ± 3.8</b>	85.6 ± 1.2
3 IPV by 24 months	97.8 ± 2.4	<b>95.9 ± 2.7</b>	94.6 ± 0.8
1 MMR by 24 months	97.8 ± 2.4	<b>96.7 ± 2.5</b>	93.4 ± 0.8
UTD Hib by 24 months	96.8 ± 3.0	<b>94.3 ± 3.2</b>	90.3 ± 1.0
3 Hep B by 24 months	98.9 ± 1.7	<b>98.4 ± 1.8</b>	95.8 ± 0.7
1 Varicella by 24 months	97.8 ± 2.4	<b>96.7 ± 2.5</b>	93.3 ± 0.8
UTD PCV by 24 months	94.6 ± 3.8	<b>94.3 ± 3.2</b>	92.4 ± 0.9
2 Hep A by 24 months	75.3 ± 7.3	<b>67.5 ± 6.5</b>	60.8 ± 1.7
2 Rotavirus by 24 months	93.5 ± 4.1	<b>92.7 ± 3.6</b>	87.6 ± 1.1
1+ Influenza by 24 months	74.2 ± 7.4	<b>59.3 ± 6.8</b>	60.7 ± 1.7
Hep B birth dose by 4 days	97.8 ± 2.4	<b>96.7 ± 2.5</b>	86.5 ± 1.2

<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 2016  
*Italicized and bolded font indicate a significant difference with 2017 rate*

**Figure 8-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 8-1, 2010-2017**



**Demographic Findings**

The demographic breakdown of the District 8-1 sample (and all District 8-1 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 8-1-C.

Due to small sample sizes and inherent limitations of the data, no major differences in the UTD rates were found between the demographic subgroups in District 8-1.

**Table 8-1-C: District 8-1 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		8-1 Sample ‡ n = 123	All 2015 births ‡ N = 3,428	GRITS alone n = 123 (%)	24 months n = 123 (%)	End of study n = 123 (%)
Mother's race*	White	67 (54.5%)	2052 (59.9%)	85.1 ± 6.7	89.6 ± 5.7	95.5 ± 3.9
	Black	52 (42.3%)	1245 (36.3%)	84.6 ± 7.7	92.3 ± 5.7	92.3 ± 5.7
	Asian	3 (2.4%)	55 (1.6%)	sample size is too small to generate estimates		
	Other	1 (0.8%)	76 (2.2%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	112 (91.1%)	3120 (91.0%)	84.8 ± 5.2	91.1 ± 4.1	94.6 ± 3.3
	Hispanic	11 (8.9%)	307 (9.0%)	90.9 ± 13.0	90.9 ± 13.0	90.9 ± 13.0
Mother's age*	<25 years old	55 (44.7%)	1379 (40.2%)	90.9 ± 5.9	96.4 ± 3.9	96.4 ± 3.9
	25 - 35 years old	55 (44.7%)	1752 (51.1%)	78.2 ± 8.5	85.5 ± 7.3	92.7 ± 5.4
	35+ years old	13 (10.6%)	297 (8.7%)	92.3 ± 11.0	92.3 ± 11.0	92.3 ± 11.0
Mother's education*	Some college or higher	61 (49.6%)	1722 (50.2%)	86.9 ± 6.6	93.4 ± 4.9	98.4 ± 2.5
	High School Graduate/GED	38 (30.9%)	1057 (30.8%)	81.6 ± 9.7	86.8 ± 8.4	89.5 ± 7.6
	9th - 11th grade	22 (17.9%)	535 (15.6%)	86.4 ± 11.0	90.9 ± 9.4	90.9 ± 9.4
	<9th grade	2 (1.6%)	109 (3.2%)	sample size is too small to generate estimates		
Marital status*	Married	57 (46.3%)	1699 (49.6%)	86.0 ± 7.1	89.5 ± 6.2	94.7 ± 4.5
	Unmarried	66 (53.7%)	1728 (50.4%)	84.8 ± 6.8	92.4 ± 5.0	93.9 ± 4.5
Child's WIC status	WIC	90 (73.2%)		84.4 ± 5.9	90.0 ± 4.9	92.2 ± 4.3
	Non-WIC	33 (26.8%)		87.9 ± 8.7	93.9 ± 6.4	100.0 ± 0.0
Number of provider(s) visited	One	103 (83.7%)		87.4 ± 5.0	92.2 ± 4.0	95.1 ± 3.3
	Two	18 (14.6%)		77.8 ± 15.0	88.9 ± 11.0	94.4 ± 8.3
	Three or more	1 (0.8%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	119 (96.7%)		86.6 ± 4.8	91.6 ± 3.9	95.0 ± 3.1
	Public			sample size is too small to generate estimates		
	Both	3 (2.4%)		sample size is too small to generate estimates		

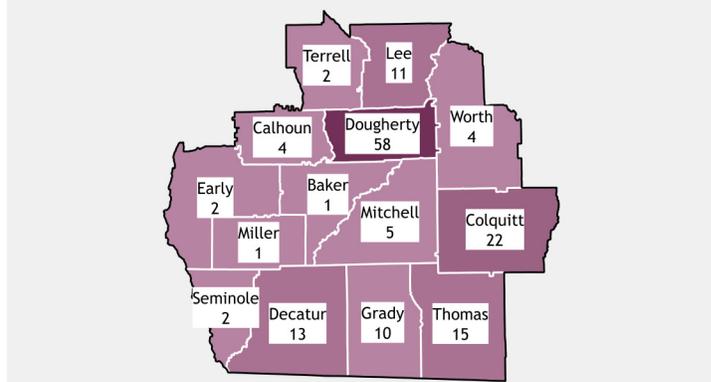
‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 8-2

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



Figure 8-2-B: Sampling per County, District 8-2, 2017



## Final Sample Determination

The original 2017 GIS sample for District 8-2 consisted of 150 children born in January of 2015 (Table 8-2-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 8-2, which was used to calculate all rates, was 132. 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 2017.

## Immunization Rates

In District 8-2, the UTD immunization rate by 24 months of age was 81.8%, which was lower than the 2016 rate (86.2%) and the state average (83.6%) (Table 8-2-B). The UTD immunization rate based on GRITS alone was 79.5%, lower than the 2016 rate (80.7%), and higher than the state average (77.9%). The UTD immunization rate by end of data collection was 92.4%, which was higher than the 2016 rate (89.9%), and the state average (92.3%).

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 2017 are shown as **red** in Table 8-2-B and Figure 8-2-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 8-2-B.

## Immunization Administration

Of the 2,421 vaccine doses administered to the District 8-2 cohort, 252 (10.4%) were administered by public health providers and 2,169 (89.6%) were administered by private providers.

Table 8-2-A: GIS Sampling Scheme, District 8-2, 2017

	2016	2017	State 2017
Original sample (n)	117	150	3062
Ineligible (n)	5	15	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	112	135	2853
Unable to locate <sup>†</sup> (n)	3	3	169
Final sample (n)	109	132	2684
Response rate (%)	97.3	97.8	94.1

<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, 2017

	2016 n = 109 (%)	2017 n = 132 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	80.7 ± 6.2	<b>79.5 ± 5.4</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	86.2 ± 5.4	<b>81.8 ± 5.2</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	89.9 ± 4.7	<b>92.4 ± 3.6</b>	92.3 ± 0.9
3 DTaP by 24 months	94.5 ± 3.6	<b>97.7 ± 2.0</b>	95.9 ± 0.7
4 DTaP by 24 months	86.2 ± 5.4	<b>82.6 ± 5.1</b>	85.6 ± 1.2
3 IPV by 24 months	94.5 ± 3.6	<b>97.0 ± 2.3</b>	94.6 ± 0.8
1 MMR by 24 months	95.4 ± 3.3	<b>91.7 ± 3.7</b>	93.4 ± 0.8
UTD Hib by 24 months	93.6 ± 3.8	<b>88.6 ± 4.3</b>	90.3 ± 1.0
3 Hep B by 24 months	98.2 ± 2.1	<b>98.5 ± 1.6</b>	95.8 ± 0.7
1 Varicella by 24 months	95.4 ± 3.3	<b>90.9 ± 3.9</b>	93.3 ± 0.8
UTD PCV by 24 months	91.7 ± 4.3	<b>93.2 ± 3.4</b>	92.4 ± 0.9
2 Hep A by 24 months	67.9 ± 7.3	<b>59.8 ± 6.6</b>	60.8 ± 1.7
2 Rotavirus by 24 months	78.0 ± 6.5	<b>87.1 ± 4.5</b>	87.6 ± 1.1
1+ Influenza by 24 months	60.6 ± 7.7	<b>58.3 ± 6.6</b>	60.7 ± 1.7
Hep B birth dose by 4 days	88.1 ± 5.1	<b>93.2 ± 3.4</b>	86.5 ± 1.2

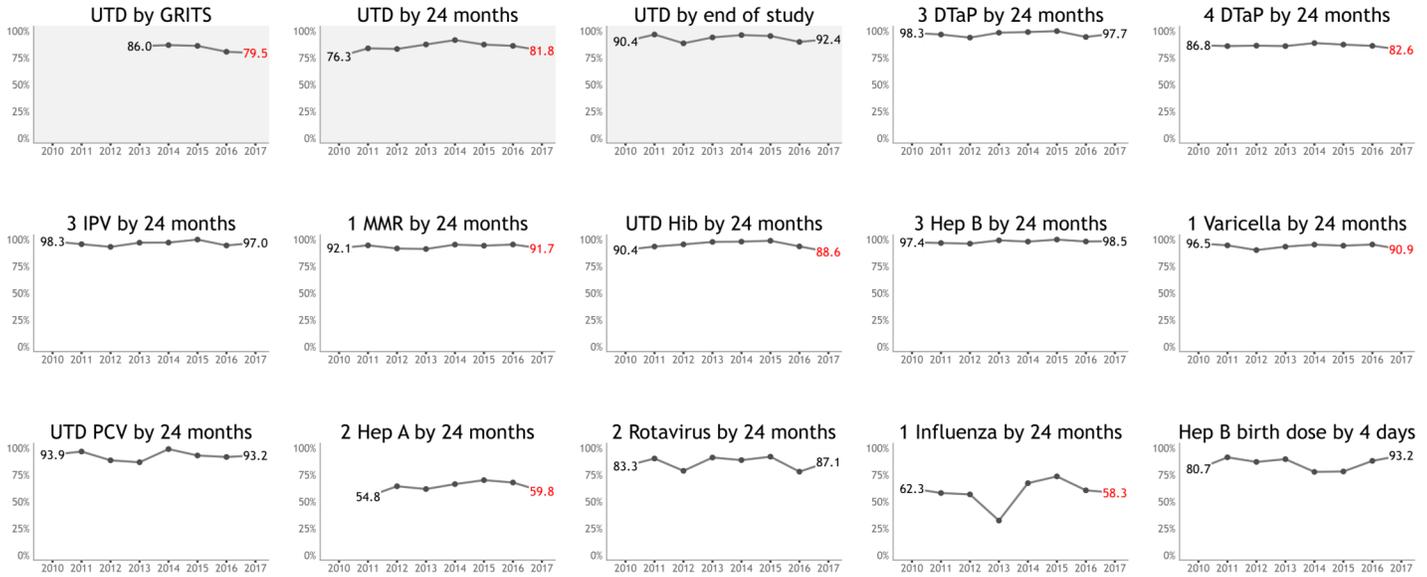
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 8-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 8-2, 2010-2017



**Demographic Findings**

The demographic breakdown of the District 8-2 sample (and all District 8-2 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 8-2-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 8-2.-C.

Table 8-2-C: District 8-2 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		8-2 Sample $n = 132$	All 2015 births $N = 4,302$	GRITS alone $n = 132$ (%)	24 months $n = 132$ (%)	End of study $n = 132$ (%)
Mother's race*	White	62 (47.0%)	2113 (48.4%)	77.4 ± 8.2	80.6 ± 7.8	93.5 ± 4.8
	Black	69 (52.3%)	2155 (49.4%)	81.2 ± 7.3	82.6 ± 7.1	91.3 ± 5.2
	Asian	1 (0.8%)	34 (0.8%)	sample size is too small to generate estimates		
	Other			sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	118 (89.4%)	3975 (91.1%)	79.7 ± 5.7	82.2 ± 5.4	91.5 ± 4.0
	Hispanic	14 (10.6%)	383 (8.8%)	78.6 ± 17.0	78.6 ± 17.0	100.0 ± 0.0
Mother's age*	<25 years old	72 (54.5%)	1907 (43.7%)	70.8 ± 8.3	<b>73.6 ± 8.0</b>	90.3 ± 5.4
	25 - 35 years old	53 (40.2%)	2074 (47.5%)	88.7 ± 6.7	<b>90.6 ± 6.2</b>	94.3 ± 4.9
	35+ years old	7 (5.3%)	381 (8.7%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's education*	Some college or higher	44 (33.3%)	1916 (43.9%)	88.6 ± 7.4	90.9 ± 6.7	97.7 ± 3.5
	High School Graduate/GED	56 (42.4%)	1554 (35.6%)	75.0 ± 8.9	78.6 ± 8.5	89.3 ± 6.4
	9th - 11th grade	28 (21.2%)	656 (15.0%)	75.0 ± 13.0	75.0 ± 13.0	92.9 ± 7.5
	<9th grade	3 (2.3%)	223 (5.1%)	sample size is too small to generate estimates		
Marital status*	Married	53 (40.2%)	1719 (39.4%)	81.1 ± 8.3	84.9 ± 7.6	94.3 ± 4.9
	Unmarried	79 (59.8%)	2643 (60.6%)	78.5 ± 7.1	79.7 ± 7.0	91.1 ± 4.9
Child's WIC status	WIC	103 (78.0%)		76.7 ± 6.4	78.6 ± 6.2	91.3 ± 4.3
	Non-WIC	29 (22.0%)		89.7 ± 8.7	93.1 ± 7.3	96.6 ± 5.2
Number of provider(s) visited	One	95 (72.0%)		84.2 ± 5.8	<b>86.3 ± 5.5</b>	92.6 ± 4.1
	Two	35 (26.5%)		65.7 ± 12.0	<b>68.6 ± 12.0</b>	91.4 ± 7.3
	Three or more	2 (1.5%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	98 (74.2%)		83.7 ± 5.8	<b>85.7 ± 5.5</b>	92.9 ± 4.0
	Public	6 (4.5%)		100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
	Both	28 (21.2%)		60.7 ± 14.0	<b>64.3 ± 14.0</b>	89.3 ± 9.0

‡ 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 indicate a significant difference**

# District 9-1

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

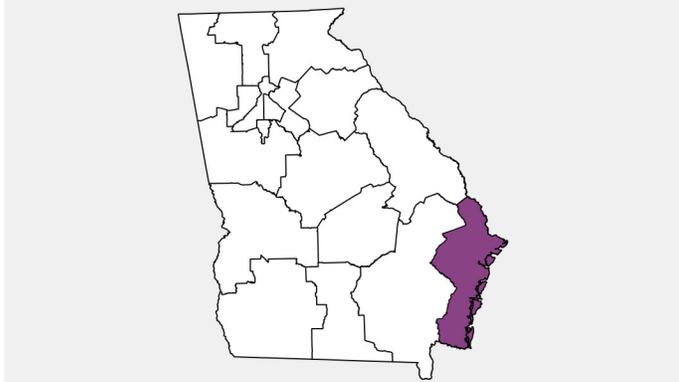
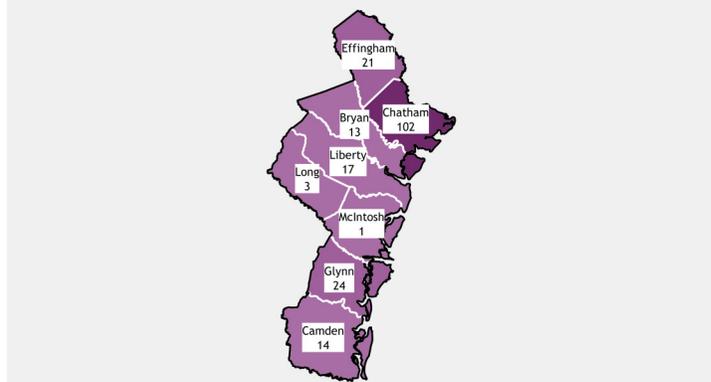


Figure 9-1-B: Sampling per County, District 9-1, 2017



## Final Sample Determination

The original 2017 GIS sample for District 9-1 consisted of 195 children born in January of 2015 (Table 9-1-A). Of these, 20 children were determined to be ineligible for the study. Of those eligible, 9 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 166. 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 2017.

## Immunization Rates

In District 9-1, the UTD immunization rate by 24 months of age was 77.7%, which was higher than the 2016 rate (73.5%) and lower than the state average (83.6%) (Table 9-1-B). The UTD immunization rate based on GRITS alone was 71.1%, higher than the 2016 rate (68.7%), and lower than the state average (77.9%). The UTD immunization rate by end of data collection was 89.8%, which was higher than the 2016 rate (81.9%), and lower than the state average (92.3%).

Most 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 2017 are shown as **red** in Table 9-1-B and Figure 9-1-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 9-1-B.

## Immunization Administration

Of the 2,959 vaccines doses administered to the District 9-1 cohort, 294 (9.9%) were administered by public health providers and 2,665 (90.1%) were administered by private providers.

Table 9-1-A: GIS Sampling Scheme, District 9-1, 2017

	2016	2017	State 2017
Original sample (n)	107	195	3062
Ineligible (n)	16	20	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	91	175	2853
Unable to locate <sup>†</sup> (n)	8	9	169
Final sample (n)	83	166	2684
Response rate (%)	91.2	94.9	94.1

<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, 2017

	2016 n = 83 (%)	2017 n = 166 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	68.7 ± 9.3	71.1 ± 6.0	77.9 ± 1.4
UTD immunization rate* by 24 months	73.5 ± 8.9	77.7 ± 5.5	83.6 ± 1.3
UTD immunization rate* by end of data collection†	81.9 ± 7.7	89.8 ± 4.0	92.3 ± 0.9
3 DTaP by 24 months	88.0 ± 6.5	92.8 ± 3.4	95.9 ± 0.7
4 DTaP by 24 months	74.7 ± 8.7	79.5 ± 5.3	85.6 ± 1.2
3 IPV by 24 months	85.5 ± 7.1	92.2 ± 3.5	94.6 ± 0.8
1 MMR by 24 months	88.0 ± 6.5	89.2 ± 4.1	93.4 ± 0.8
UTD Hib by 24 months	88.0 ± 6.5	86.7 ± 4.5	90.3 ± 1.0
3 Hep B by 24 months	88.0 ± 6.5	94.6 ± 3.0	95.8 ± 0.7
1 Varicella by 24 months	85.5 ± 7.1	88.6 ± 4.2	93.3 ± 0.8
UTD PCV by 24 months	83.1 ± 7.5	89.8 ± 4.0	92.4 ± 0.9
2 Hep A by 24 months	57.8 ± 9.9	61.4 ± 6.4	60.8 ± 1.7
2 Rotavirus by 24 months	73.5 ± 8.9	76.5 ± 5.6	87.6 ± 1.1
1+ Influenza by 24 months	55.4 ± 10.0	57.2 ± 6.5	60.7 ± 1.7
Hep B birth dose by 4 days	74.7 ± 8.7	82.5 ± 5.0	86.5 ± 1.2

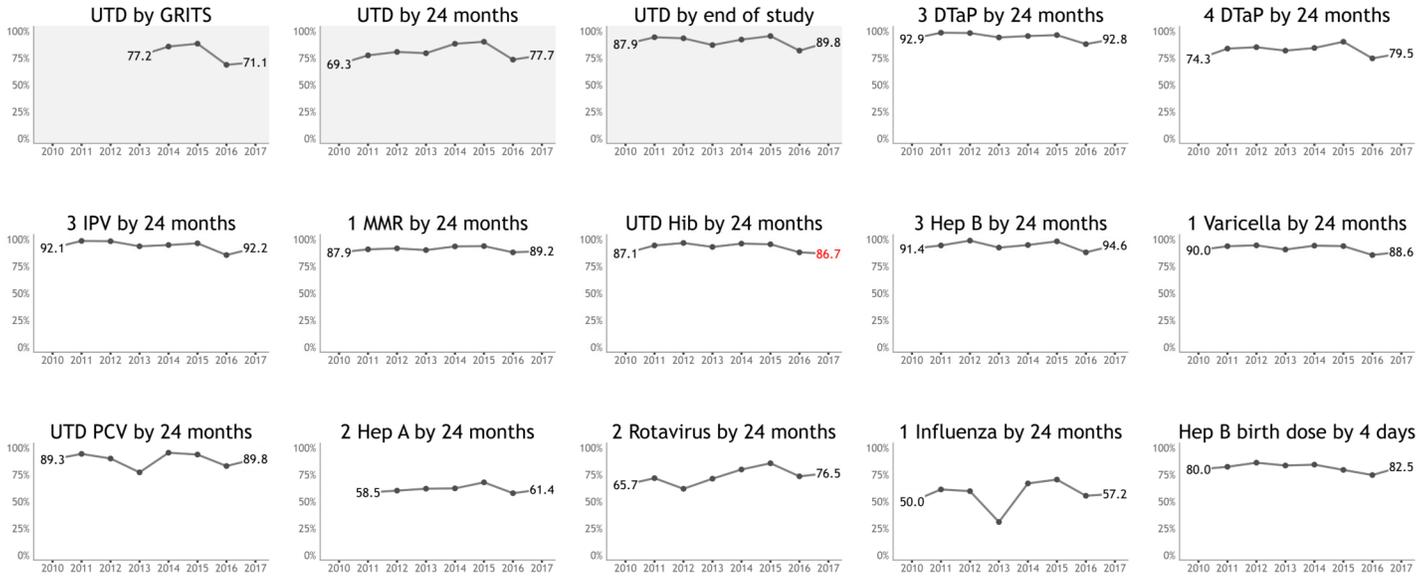
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 9-1-C: Immunization Rates (%) by Series and Vaccine Antigen, District 9-1, 2010-2017



Demographic Findings

The demographic breakdown of the District 9-1 sample (and all District 9-1 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 9-1-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 9-1-C.

Table 9-1-C: District 9-1 Sample Demographics and Immunization Rates, 2017

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		9-1 Sample $n = 166$	All 2015 births $N = 7,591$	GRITS alone $n = 166$ (%)	24 months $n = 166$ (%)	End of study $n = 166$ (%)
Mother's race*	White	90 (54.2%)	4567 (59.0%)	71.1 ± 8.1	82.2 ± 6.8	91.1 ± 5.1
	Black	68 (41.0%)	2681 (34.6%)	69.1 ± 9.5	70.6 ± 9.4	86.8 ± 7.0
	Asian					
	Other	8 (4.8%)	343 (4.4%)	87.5 ± 20.0	87.5 ± 20.0	100.0 ± 0.0
Mother's ethnicity*	Non-Hispanic	155 (93.4%)	6894 (89.1%)	71.6 ± 6.2	77.4 ± 5.7	89.7 ± 4.2
	Hispanic	11 (6.6%)	699 (9.0%)	63.6 ± 25.0	81.8 ± 20.0	90.9 ± 15.0
Mother's age*	<25 years old	64 (38.6%)	2573 (33.2%)	67.2 ± 10.0	75.0 ± 9.2	87.5 ± 7.0
	25 - 35 years old	83 (50.0%)	4249 (54.9%)	74.7 ± 8.1	79.5 ± 7.5	90.4 ± 5.5
	35+ years old	19 (11.4%)	919 (11.9%)	68.4 ± 18.0	78.9 ± 16.0	94.7 ± 8.7
Mother's education*	Some college or higher	96 (57.8%)	4441 (57.4%)	71.9 ± 7.8	77.1 ± 7.3	91.7 ± 4.8
	High School Graduate/GED	50 (30.1%)	2278 (29.4%)	68.0 ± 11.0	78.0 ± 10.0	86.0 ± 8.3
	9th - 11th grade	18 (10.8%)	802 (10.4%)	72.2 ± 18.0	77.8 ± 17.0	88.9 ± 13.0
	<9th grade	2 (1.2%)	178 (2.3%)	sample size is too small to generate estimates		
Marital status*	Married	78 (47.0%)	4137 (53.4%)	83.3 ± 7.2	<b>89.7 ± 5.8</b>	96.2 ± 3.7
	Unmarried	88 (53.0%)	3594 (46.4%)	60.2 ± 8.9	<b>67.0 ± 8.5</b>	84.1 ± 6.6
Child's WIC status	WIC	95 (57.2%)		66.3 ± 8.2	<b>71.6 ± 7.9</b>	87.4 ± 5.8
	Non-WIC	71 (42.8%)		77.5 ± 8.4	<b>85.9 ± 7.0</b>	93.0 ± 5.2
Number of provider(s) visited	One	116 (69.9%)		78.4 ± 6.5	<b>85.3 ± 5.6</b>	94.0 ± 3.8
	Two	40 (24.1%)		65.0 ± 13.0	72.5 ± 12.0	90.0 ± 8.1
	Three or more	4 (2.4%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	116 (69.9%)		79.3 ± 6.4	<b>87.1 ± 5.3</b>	95.7 ± 3.2
	Public	8 (4.8%)		75.0 ± 26.0	75.0 ± 26.0	75.0 ± 26.0
	Both	36 (21.7%)		55.6 ± 14.0	<b>61.1 ± 14.0</b>	88.9 ± 8.9

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
**Bolded and italicized indicate a significant difference**

# District 9-2

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

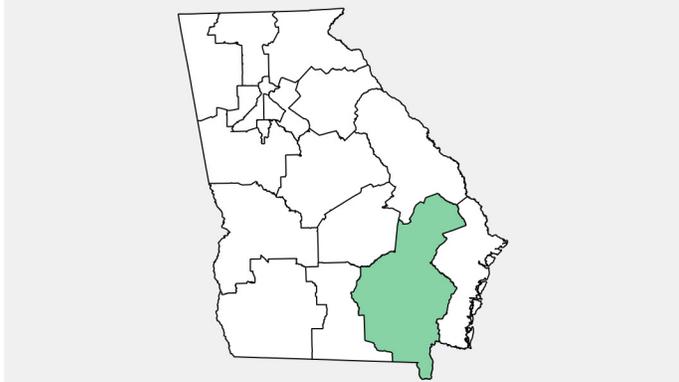
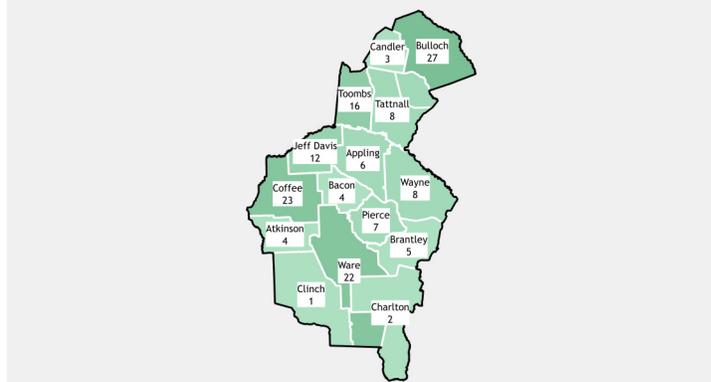


Figure 9-2-B: Sampling per County, District 9-2, 2017



## Final Sample Determination

The original 2017 GIS sample for District 9-2 consisted of 155 children born in January of 2015 (Table 9-2-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 9-2, which was used to calculate all rates, was 144. 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 2017.

## Immunization Rates

In District 9-2, the UTD immunization rate by 24 months of age was 81.9%, which was higher than the 2016 rate (77.2%) and lower than the state average (83.6%) (Table 9-2-B). The UTD immunization rate based on GRITS alone was 76.4%, higher than the 2016 rate (75.0%), and lower than the state average (77.9%). The UTD immunization rate by end of data collection was 91.0%, which was lower than the 2016 rate (94.1%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 9-2-B and Figure 9-2-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 9-2-B.

## Immunization Administration

Of the 2,630 vaccines doses administered to the District 9-2 cohort, 364 (13.8%) were administered by public health providers and 2,266 (86.2%) were administered by private providers.

Table 9-2-A: GIS Sampling Scheme, District 9-2, 2017

	2016	2017	State 2017
Original sample (n)	152	155	3062
Ineligible (n)	12	9	209
(Refused to participate) (n)	0	0	16
Eligible sample (n)	140	146	2853
Unable to locate <sup>†</sup> (n)	4	2	169
Final sample (n)	136	144	2684
Response rate (%)	97.1	98.6	94.1

<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, 2017

	2016 n = 136 (%)	2017 n = 144 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	75.0 ± 5.9	76.4 ± 5.4	77.9 ± 1.4
UTD immunization rate* by 24 months	77.2 ± 5.7	81.9 ± 4.9	83.6 ± 1.3
UTD immunization rate* by end of data collection†	94.1 ± 3.2	<b>91.0 ± 3.7</b>	92.3 ± 0.9
3 DTaP by 24 months	97.8 ± 2.0	97.9 ± 1.8	95.9 ± 0.7
4 DTaP by 24 months	78.7 ± 5.5	85.4 ± 4.5	85.6 ± 1.2
3 IPV by 24 months	97.8 ± 2.0	<b>96.5 ± 2.3</b>	94.6 ± 0.8
1 MMR by 24 months	93.4 ± 3.4	93.8 ± 3.1	93.4 ± 0.8
UTD Hib by 24 months	89.7 ± 4.1	<b>88.9 ± 4.0</b>	90.3 ± 1.0
3 Hep B by 24 months	97.8 ± 2.0	97.9 ± 1.8	95.8 ± 0.7
1 Varicella by 24 months	94.9 ± 3.0	<b>93.8 ± 3.1</b>	93.3 ± 0.8
UTD PCV by 24 months	90.4 ± 4.0	<b>90.3 ± 3.8</b>	92.4 ± 0.9
2 Hep A by 24 months	64.7 ± 6.5	<b>55.6 ± 6.4</b>	60.8 ± 1.7
2 Rotavirus by 24 months	87.5 ± 4.5	<b>88.9 ± 4.0</b>	87.6 ± 1.1
1+ Influenza by 24 months	46.3 ± 6.8	<b>45.8 ± 6.4</b>	<b>60.7 ± 1.7</b>
Hep B birth dose by 4 days	94.9 ± 3.0	<b>93.1 ± 3.3</b>	86.5 ± 1.2

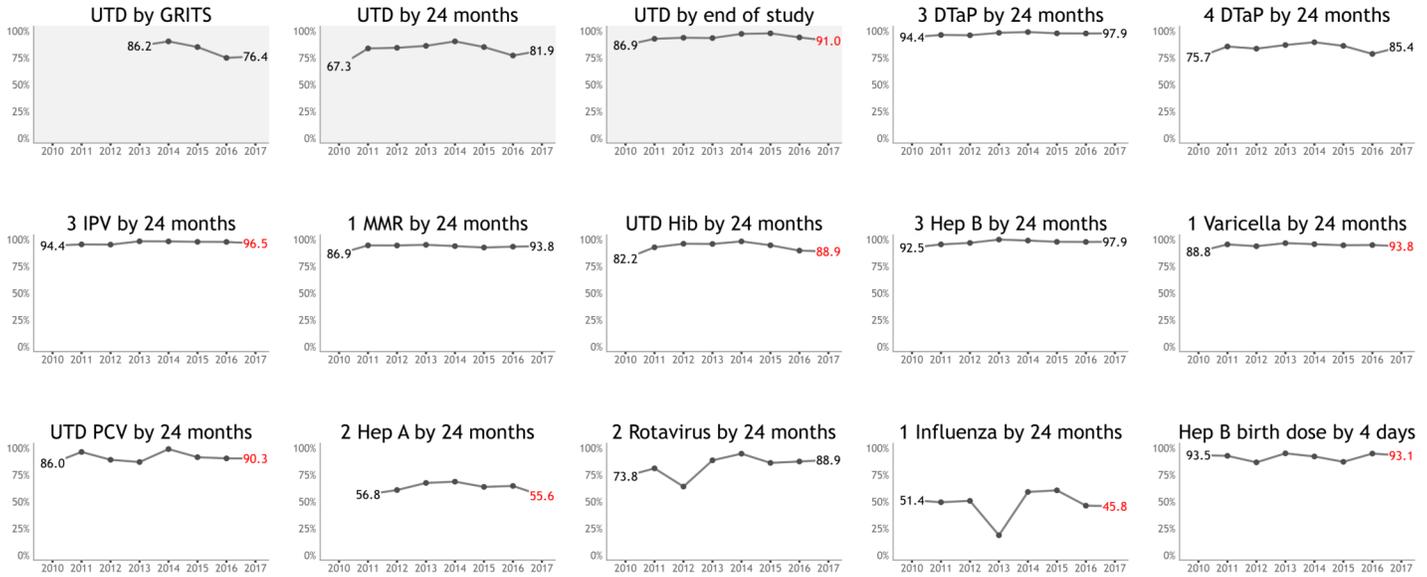
<sup>†</sup> Includes children who become UTD during the data collection period

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

Red font indicates a rate decrease since 2016

Italicized and bolded font indicate a significant difference with 2017 rate

Figure 9-2-C: Immunization Rates (%) by Series and Vaccine Antigen, District 9-2, 2010-2017



Demographic Findings

The demographic breakdown of the District 9-2 sample (and all District 9-2 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 9-2-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 9-2-C.

Table 9-2-C: District 9-2 Sample Demographics and Immunization Rates, 2017

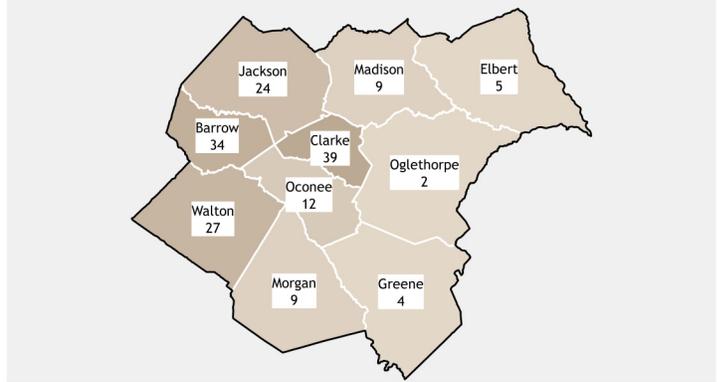
Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		9-2 Sample ‡ n = 144	All 2015 births ‡ N = 4,670	GRITS alone n = 144 (%)	24 months n = 144 (%)	End of study n = 144 (%)
Mother's race*	White	93 (64.6%)	3279 (70.2%)	80.6 ± 6.3	84.9 ± 5.7	91.4 ± 4.5
	Black	48 (33.3%)	1245 (26.7%)	66.7 ± 10.0	75.0 ± 9.6	89.6 ± 6.8
	Asian	1 (0.7%)	41 (0.9%)	sample size is too small to generate estimates		
	Other	2 (1.4%)	105 (2.2%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	126 (87.5%)	4140 (88.7%)	73.0 ± 6.1	79.4 ± 5.5	89.7 ± 4.2
	Hispanic	18 (12.5%)	516 (11.0%)	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
Mother's age*	<25 years old	67 (46.5%)	2066 (44.2%)	76.1 ± 8.0	82.1 ± 7.2	92.5 ± 4.9
	25 - 35 years old	64 (44.4%)	2199 (47.1%)	73.4 ± 8.5	79.7 ± 7.7	89.1 ± 6.0
	35+ years old	13 (9.0%)	405 (8.7%)	92.3 ± 11.0	92.3 ± 11.0	92.3 ± 11.0
Mother's education*	Some college or higher	59 (41.0%)	1966 (42.1%)	79.7 ± 8.0	84.7 ± 7.2	91.5 ± 5.6
	High School Graduate/GED	56 (38.9%)	1630 (34.9%)	73.2 ± 9.1	80.4 ± 8.1	89.3 ± 6.3
	9th - 11th grade	22 (15.3%)	839 (18.0%)	72.7 ± 15.0	77.3 ± 14.0	90.9 ± 9.4
	<9th grade	5 (3.5%)	215 (4.6%)	sample size is too small to generate estimates		
Marital status*	Married	68 (47.2%)	2261 (48.4%)	83.8 ± 6.9	86.8 ± 6.3	94.1 ± 4.4
	Unmarried	76 (52.8%)	2409 (51.6%)	69.7 ± 8.1	77.6 ± 7.3	88.2 ± 5.7
Child's WIC status	WIC	109 (75.7%)		76.1 ± 6.3	80.7 ± 5.8	89.9 ± 4.4
	Non-WIC	35 (24.3%)		77.1 ± 11.0	85.7 ± 9.1	94.3 ± 6.0
Number of provider(s) visited	One	96 (66.7%)		82.3 ± 6.0	87.5 ± 5.2	91.7 ± 4.3
	Two	44 (30.6%)		68.2 ± 11.0	72.7 ± 10.0	93.2 ± 5.8
	Three or more	2 (1.4%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	93 (64.6%)		82.8 ± 6.0	<b>88.2 ± 5.1</b>	92.5 ± 4.2
	Public	7 (4.9%)		85.7 ± 20.0	85.7 ± 20.0	85.7 ± 20.0
	Both	42 (29.2%)		64.3 ± 11.0	<b>71.4 ± 11.0</b>	92.9 ± 6.1

‡ Percentages may not add up to 100% because the information was missing for some participants  
 \* Variable was collected at time of delivery  
 Bolded and italicized indicate a significant difference

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



Figure 10-0-B: Sampling per County, District 10-0, 2017



### Final Sample Determination

The original 2017 GIS sample for District 10-0 consisted of 165 children born in January of 2015 (Table 10-0-A). Of these, 6 children were determined to be ineligible for the study. Of those eligible, 6 children were unable to be located and were therefore excluded. The final sample size for District 10-0, 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 2017.

### Immunization Rates

In District 10-0, the UTD immunization rate by 24 months of age was 83.0%, which was lower than the 2016 rate (83.5%) and the state average (83.6%) (Table 10-0-B). The UTD immunization rate based on GRITS alone was 78.4%, lower than the 2016 rate (82.7%), and higher than the state average (77.9%). The UTD immunization rate by end of data collection was 88.9%, which was lower than the 2016 rate (92.9%), and the state average (92.3%).

Most 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 2017 are shown as **red** in Table 10-0-B and Figure 10-0-C. Significant differences ( $p < 0.05$ ) between the 2017 district rates and the 2016 district and 2017 state rates are *italicized and bolded* in Table 10-0-B.

### Immunization Administration

Of the 2,775 vaccines doses administered to the District 10-0 cohort, 93 (3.4%) were administered by public health providers and 2,682 (96.6%) were administered by private providers.

Table 10-0-A: GIS Sampling Scheme, District 10-0, 2017

	2016	2017	State 2017
Original sample (n)	134	165	3062
Ineligible (n)	7	6	209
(Refused to participate) (n)	2	0	16
Eligible sample (n)	127	159	2853
Unable to locate <sup>†</sup> (n)	0	6	169
Final sample (n)	127	153	2684
Response rate (%)	100.0	96.2	94.1

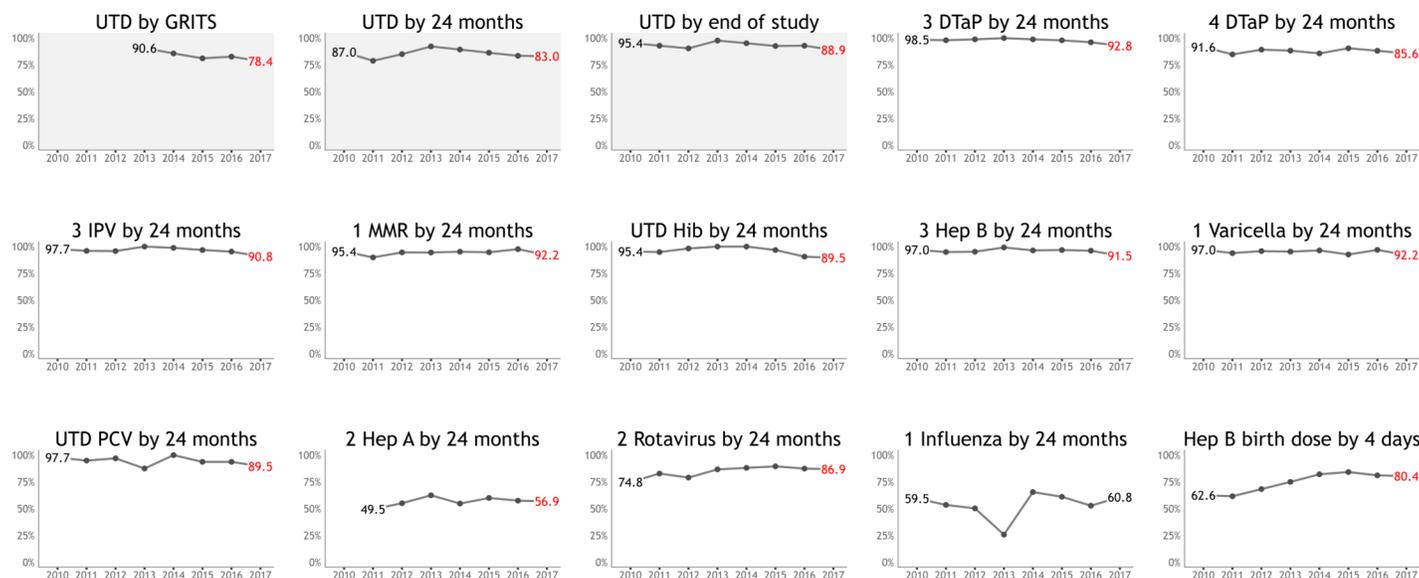
<sup>†</sup> Children were classified as “Unable to Locate” if every conceivable effort was made to locate and communicate with the child’s guardian and the child’s provider was either unknown or also unable to locate the guardian

Table 10-0-B: Immunization Rates by Series and Vaccine Antigen, District 10-0, 2017

	2016 n = 127 (%)	2017 n = 153 (%)	State n = 2,684 (%)
UTD immunization rate* based on GRITS alone	82.7 ± 5.6	<b>78.4 ± 5.4</b>	77.9 ± 1.4
UTD immunization rate* by 24 months	83.5 ± 5.5	<b>83.0 ± 4.9</b>	83.6 ± 1.3
UTD immunization rate* by end of data collection <sup>†</sup>	92.9 ± 3.8	<b>88.9 ± 4.1</b>	92.3 ± 0.9
3 DTaP by 24 months	96.1 ± 2.9	<b>92.8 ± 3.4</b>	95.9 ± 0.7
4 DTaP by 24 months	88.2 ± 4.8	<b>85.6 ± 4.6</b>	85.6 ± 1.2
3 IPV by 24 months	95.3 ± 3.2	<b>90.8 ± 3.8</b>	94.6 ± 0.8
1 MMR by 24 months	97.6 ± 2.3	<b>92.2 ± 3.5</b>	93.4 ± 0.8
UTD Hib by 24 months	90.6 ± 4.3	<b>89.5 ± 4.0</b>	90.3 ± 1.0
3 Hep B by 24 months	96.1 ± 2.9	<b>91.5 ± 3.6</b>	<b>95.8 ± 0.7</b>
1 Varicella by 24 months	96.9 ± 2.6	<b>92.2 ± 3.5</b>	93.3 ± 0.8
UTD PCV by 24 months	93.7 ± 3.6	<b>89.5 ± 4.0</b>	92.4 ± 0.9
2 Hep A by 24 months	57.5 ± 7.3	<b>56.9 ± 6.5</b>	60.8 ± 1.7
2 Rotavirus by 24 months	87.4 ± 4.9	<b>86.9 ± 4.4</b>	87.6 ± 1.1
1+ Influenza by 24 months	52.8 ± 7.4	<b>60.8 ± 6.4</b>	60.7 ± 1.7
Hep B birth dose by 4 days	81.1 ± 5.8	<b>80.4 ± 5.2</b>	<b>86.5 ± 1.2</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 2016**  
*Italicized and bolded font indicate a significant difference with 2017 rate*

**Figure 10-0-C: Immunization Rates (%) by Series and Vaccine Antigen, District 10-0, 2010-2017**



### Demographic Findings

The demographic breakdown of the District 10-0 sample (and all District 10-0 births in 2015), alongside the UTD immunization rates by demographic groups are shown in Table 10-0-C.

Significant differences ( $p < 0.05$ ) in UTD by 24 months rates between demographic subgroups are *italicized and bolded* in Table 10-0-C. Brackets are used to indicate significantly different results between subgroups.

**Table 10-0-C: District 10-0 Sample Demographics and Immunization Rates, 2017**

Group	Demographic Subgroup	Demographic Breakdown		UTD Immunization Rates		
		10-0 Sample $n = 153$	All 2015 births $N = 5,586$	GRITS alone $n = 153$ (%)	24 months $n = 153$ (%)	End of study $n = 153$ (%)
Mother's race*	White	114 (74.5%)	4127 (73.9%)	81.6 ± 5.9	86.8 ± 5.1	90.4 ± 4.5
	Black	32 (20.9%)	1119 (20.0%)	71.9 ± 13.0	75.0 ± 12.0	84.4 ± 10.0
	Asian	3 (2.0%)	152 (2.7%)	sample size is too small to generate estimates		
	Other	4 (2.6%)	188 (3.4%)	sample size is too small to generate estimates		
Mother's ethnicity*	Non-Hispanic	134 (87.6%)	4993 (89.4%)	76.1 ± 6.0	81.3 ± 5.4	88.1 ± 4.5
	Hispanic	19 (12.4%)	547 (9.8%)	94.7 ± 8.3	94.7 ± 8.3	94.7 ± 8.3
Mother's age*	<25 years old	61 (39.9%)	1745 (31.2%)	83.6 ± 7.7	<b>88.5 ± 6.6</b>	90.2 ± 6.2
	25 - 35 years old	75 (49.0%)	3124 (55.9%)	78.7 ± 7.7	<b>84.0 ± 6.9</b>	93.3 ± 4.7
	35+ years old	17 (11.1%)	717 (12.8%)	58.8 ± 19.0	<b>58.8 ± 19.0</b>	64.7 ± 19.0
Mother's education*	Some college or higher	85 (55.6%)	3003 (53.8%)	80.0 ± 7.0	84.7 ± 6.3	88.2 ± 5.7
	High School Graduate/GED	46 (30.1%)	1684 (30.1%)	80.4 ± 9.5	84.8 ± 8.6	91.3 ± 6.7
	9th - 11th grade	16 (10.5%)	680 (12.2%)	56.2 ± 20.0	62.5 ± 20.0	81.2 ± 16.0
	<9th grade	5 (3.3%)	164 (2.9%)	sample size is too small to generate estimates		
Marital status*	Married	89 (58.2%)	3331 (59.6%)	83.1 ± 6.4	85.4 ± 6.1	89.9 ± 5.2
	Unmarried	64 (41.8%)	2252 (40.3%)	71.9 ± 9.1	79.7 ± 8.1	87.5 ± 6.7
Child's WIC status	WIC	80 (52.3%)		77.5 ± 7.6	82.5 ± 6.9	90.0 ± 5.4
	Non-WIC	73 (47.7%)		79.5 ± 7.7	83.6 ± 7.0	87.7 ± 6.2
Number of provider(s) visited	One	114 (74.5%)		80.7 ± 6.0	86.0 ± 5.3	92.1 ± 4.1
	Two	33 (21.6%)		81.8 ± 11.0	84.8 ± 10.0	90.9 ± 8.1
	Three or more	1 (0.7%)		sample size is too small to generate estimates		
Type of provider(s) visited	Private	137 (89.5%)		80.3 ± 5.5	85.4 ± 4.9	92.0 ± 3.8
	Public	3 (2.0%)		sample size is too small to generate estimates		
	Both	8 (5.2%)		87.5 ± 19.0	87.5 ± 19.0	87.5 ± 19.0

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

\* Variable was collected at time of delivery

**Bolded and italicized indicate a significant difference**



## Appendix A: Description of Demographic Variables

Variable	Missing or Unknown	Source	Additional Information
Maternal Race	1.0%	Electronic Birth Records	“Other” race category was defined as not being “White”, “Black” or “Asian”.
Maternal Ethnicity	1.5%	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	1.6%	Electronic Birth Records	Additional coding not needed; standard measure in GA Electronic Birth Records.
Maternal Marital Status	0.1%	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	1.7%	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	1.7%	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, 2017**

- 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)	151	4	0	0	2	4	2	5	2	19
1-2 North Georgia (Dalton)	133	0	0	0	2	4	0	0	0	6
2-0 North (Gainesville)	168	7	1	0	1	1	0	2	0	12
3-1 Cobb-Douglas	178	0	0	0	3	1	0	6	3	13
3-2 Fulton	189	0	0	0	0	1	0	7	5	13
3-3 Clayton	133	1	0	0	4	4	1	3	3	16
3-4 East Metro (Lawrenceville)	174	1	0	0	5	6	0	1	1	14
3-5 DeKalb	155	0	0	0	0	0	0	2	1	3
4-0 LaGrange	173	0	0	0	2	1	0	8	0	11
5-1 South Central (Dublin)	81	0	0	0	0	1	0	2	1	4
5-2 North Central (Macon)	164	0	0	0	4	2	2	6	2	16
6-0 East Central (Augusta)	144	1	0	0	3	0	0	1	0	5
7-0 West Central (Columbus)	123	0	0	0	0	0	1	5	0	6
8-1 South (Valdosta)	123	1	0	0	0	1	2	2	1	7
8-2 Southwest (Albany)	132	1	1	2	1	2	0	3	0	10
9-1 Coastal (Savannah)	166	1	0	0	3	12	0	0	1	17
9-2 Southeast (Waycross)	144	1	0	0	1	5	3	3	0	13
10 Northeast (Athens)	153	0	0	0	4	7	1	3	1	16
<b>Georgia</b>	<b>2684</b>	<b>18</b>	<b>2</b>	<b>2</b>	<b>35</b>	<b>52</b>	<b>12</b>	<b>59</b>	<b>21</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, 2017**

A. District response rate, 2017

B. UTD by 24 months, based on GRITS alone, 2017

C. UTD by 24 months, 2017

D. UTD by end of data collection, 2017

E. Five year Average UTD by 24 months, 2013 to 2017

F. Percent change in UTD by 24 months, 2016 to 2017

G. Percent change in UTD by end of data collection, 2016 to 2017

H. Percent change in UTD from 24 months to end of data collection, 2017

 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)	91.5	70.9	77.5	86.8	82.0	-4.7	-3.1	9.3
1-2 North Georgia (Dalton)	98.5	81.2	85.7	95.5	82.9	5.2	4.3	9.8
2-0 North (Gainesville)	100.0	80.4	83.9	92.9	83.5	-1.7	-0.6	9.0
3-1 Cobb-Douglas	96.2	74.7	84.3	92.1	84.5	-1.1	-3.0	7.8
3-2 Fulton	93.6	79.9	87.8	93.1	86.6	1.6	0.6	5.3
3-3 Clayton	93.7	70.7	78.9	88.0	78.2	0.8	-4.7	9.1
3-4 East Metro (Lawrenceville)	91.1	73.6	77.0	91.4	83.1	-5.6	-0.5	14.4
3-5 DeKalb*	78.7	82.6	87.7	96.1	84.4	10.4	7.0	8.4
4-0 LaGrange	94.5	82.1	86.7	93.6	83.4	5.7	7.2	6.9
5-1 South Central (Dublin)	91.0	75.3	80.2	95.1	80.0	5.5	8.4	14.9
5-2 North Central (Macon)	96.5	76.8	81.7	89.6	86.9	0.4	3.4	7.9
6-0 East Central (Augusta)	96.0	87.5	91.0	96.5	86.3	11.7	4.4	5.5
7-0 West Central (Columbus)	95.3	78.0	87.8	94.3	86.2	-1.4	-1.8	6.5
8-1 South (Valdosta)	93.2	85.4	91.1	94.3	89.0	-0.3	-2.5	3.2
8-2 Southwest (Albany)	97.8	79.5	81.8	92.4	86.9	-4.4	2.5	10.6
9-1 Coastal (Savannah)	94.9	71.1	77.7	89.8	81.8	4.2	7.9	12.1
9-2 Southeast (Waycross)	98.6	76.4	81.9	91.0	84.2	4.7	-3.1	9.1
10 Northeast (Athens)	96.2	78.4	83.0	88.9	86.9	-0.5	-4.0	5.9
<b>Georgia</b>	<b>94.1</b>	<b>77.9</b>	<b>83.6</b>	<b>92.3</b>	<b>83.1</b>	<b>1.5</b>	<b>1.3</b>	<b>8.7</b>

\*Caution should be taken when interpreting immunization rates for a district with a low response rate because children who are excluded from the study due to being unable-to-locate could also be the least UTD.

## Appendix D: Vaccine Antigen-Specific Rates

Appendix Table D: District Vaccine Antigen-Specific Immunization Rates, Georgia, 2017

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)	78.8	90.7	90.1	87.4	95.4	89.4	88.7	54.3	45.7	89.4
1-2 North Georgia (Dalton)	87.2	95.5	95.5	91.7	97.0	93.2	94.7	67.7	67.7	85.7
2-0 North (Gainesville)	86.9	92.9	92.3	92.9	92.3	93.5	94.0	61.9	66.1	83.9
3-1 Cobb-Douglas	86.5	91.6	93.3	91.6	93.8	93.3	91.6	60.7	64.6	78.1
3-2 Fulton	88.9	96.3	95.8	94.7	98.4	95.8	95.2	65.6	63.0	86.8
3-3 Clayton	78.9	90.2	89.5	85.7	92.5	91.0	87.2	57.1	48.9	90.2
3-4 East Metro (Lawrenceville)	81.0	95.4	92.0	84.5	93.7	93.1	91.4	51.1	64.9	81.6
3-5 DeKalb*	89.7	97.4	98.1	93.5	98.7	96.8	96.1	63.2	71.6	86.5
4-0 LaGrange	88.4	96.0	93.1	91.3	96.5	93.6	92.5	60.7	53.2	86.7
5-1 South Central (Dublin)	81.5	97.5	91.4	87.7	97.5	91.4	92.6	53.1	58.0	96.3
5-2 North Central (Macon)	82.9	95.7	91.5	88.4	95.7	90.2	90.9	62.2	59.8	94.5
6-0 East Central (Augusta)	92.4	96.5	96.5	92.4	97.2	96.5	95.1	66.0	64.6	88.2
7-0 West Central (Columbus)	88.6	95.1	95.1	93.5	97.6	95.9	92.7	74.8	58.5	94.3
8-1 South (Valdosta)	91.9	95.9	96.7	94.3	98.4	96.7	94.3	67.5	59.3	96.7
8-2 Southwest (Albany)	82.6	97.0	91.7	88.6	98.5	90.9	93.2	59.8	58.3	93.2
9-1 Coastal (Savannah)	79.5	92.2	89.2	86.7	94.6	88.6	89.8	61.4	57.2	82.5
9-2 Southeast (Waycross)	85.4	96.5	93.8	88.9	97.9	93.8	90.3	55.6	45.8	93.1
10 Northeast (Athens)	85.6	90.8	92.2	89.5	91.5	92.2	89.5	56.9	60.8	80.4
<b>Georgia</b>	<b>85.6</b>	<b>94.6</b>	<b>93.4</b>	<b>90.3</b>	<b>95.8</b>	<b>93.3</b>	<b>92.4</b>	<b>60.8</b>	<b>60.7</b>	<b>86.5</b>

\*Caution should be taken when interpreting immunization rates for a district with a low response rate because children who are excluded from the study due to being unable-to-locate could also be the least UTD.

# 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 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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Immunization Program  
Acute Disease Epidemiology Section  
**[dph.georgia.gov/immunization-section](https://dph.georgia.gov/immunization-section)**