Indiana State Department of Health

Indiana State Department of Health

Immunization Division

County Immunization Rate Assessment

2019

Immunization Division

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Contents

Data Dictionary

CHIRP	Children and Hoosiers Immunization Registry Program, also referred to as the "Indiana Immunization Registry"; the software application used by the Indiana State Department of Health Immunization Division for providers to report immunization data for patients. (Version: CoCASA v2.1 and up)
Registered in CHIRP	A record exists for the patient, regardless of data contained within that record. Many records are imported through Vital Records data, established in 2005, and contain only the patient's name and address, with no immunization data.
Active Immunization Record	A patient record that is marked as "active" in CHIRP, and contains two or more vaccinations, excluding influenza.
CDC	Centers for Disease Control and Prevention
CoCASA	Comprehensive Clinic Assessment Software Application, developed by the CDC for use in assessments. (Version 14.1)
VTrckS	Vaccine Tracking System, maintained by the CDC for use in managing vaccine ordering.
19-35 months of age	Patients born between 04/30/2016 and 08/31/2017.
4:3:1:3:3:1:4	Vaccine series assessed for 19-35 months of age: 4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 HepB, 1 Var, and 4 PCV.
DTaP	Vaccine to prevent diphtheria, tetanus, and acellular pertussis.
Polio	Vaccine to prevent poliomyelitis.
MMR	Vaccine to prevent measles, mumps, and rubella.
Hib	Vaccine to prevent Haemophilus influenzae type B.
HepB	Vaccine to prevent hepatitis B.
Var	Vaccine to prevent varicella (chicken pox).
PCV	Vaccine to prevent pneumococcal disease.
Fully Insured	A patient that has health insurance coverage that covers vaccine.
VFC	Vaccines for Children program, funded through the CDC that provides free vaccine for eligible children in the state of Indiana.
VFC Provider	An immunization provider who is enrolled in the VFC program, and therefore granted permission to order and administer vaccines covered under the VFC program to eligible persons.
VFC Eligible	A child age 0-18 is eligible to receive free vaccine under the VFC program if they are Medicaid eligible, uninsured, or have health insurance that does not cover vaccines. Also, any child who identifies as an American Indian or Alaskan Native, regardless of insurance status. (NOTE: Some of the children who are classified as "underinsured" can be funded with VFC vaccine at approved facilities*)

Not VFC Eligible	A child age 0-18 who has health insurance that covers vaccines or adults over the age of 18.
Underinsured* (Insurance Does Not Cover Vaccines)	Children who were recorded as "underinsured" by a provider in CHIRP. This should include children who have commercial (private) health insurance but the coverage does not include vaccines, children whose insurance covers only selected vaccines (these children are categorized as underinsured for non-covered vaccines only), or children whose insurance caps vaccine coverage at a certain amount (once that coverage amount is reached, these children are categorized as underinsured).
Eligible for Publicly Funded Vaccines	A child age 0-18 who is eligible for VFC vaccines, or any state-funded vaccines through 317 funds; those who are underinsured and receive non-VFC funded vaccine.
Not Eligible for Publicly Funded Vaccines	A child age 0-18 who is fully insured and therefore not eligible for any publicly funded vaccines or adults over the age of 18.
Valid Dose	A dose of vaccine that was given at the appropriate age and interval from any previous doses of vaccine according to manufacturer and ACIP guidelines.
Invalid Dose	A dose of vaccine that was not given at the appropriate age and interval from any previous doses of vaccine or at a minimum age. A patient is not considered to have immunity to the disease that the vaccine was for unless it was administered as a "valid dose".

*Please refer to the ISDH Immunization Division Eligibility Policy for a detailed definition of underinsured.

Background

Each year, the Advisory Committee for Immunization Practices (ACIP) releases a recommended immunization schedule for childhood vaccination. These recommendations are supported by the Centers for Disease Control and Prevention (CDC). For each vaccine-preventable disease, there are particular rules and guidelines in the administration of the vaccine that, if followed, result in the optimal immune response in the patient. If these guidelines are not adhered to, in some cases, a child may be left unprotected. This can include scenarios where the child was administered a dose of vaccine incorrectly (invalid dose), or those who never receive the vaccine at all.

ACIP recommends children age 19 to 35 months to complete the 4:3:1:3:3:1:4 immunization series comprised of, at least four doses of diphtheria-tetanus-acellular pertussis (DTaP), at least three doses of polio, at least one dose of measles-mumps-rubella (MMR), at least three of Haemophilus influenzae B (Hib) depending on the brand used, at least three doses of hepatitis B, at least one dose of varicella antigens, and at least 4 doses of pneumococcal conjugate vaccine (PCV).

County level vaccination coverage estimates are important, both because public health issues often originate in small geographic areas and because certain public health actions are most effective at the local level. Previously in Indiana, it has not been possible to assess childhood vaccination series completion by county with the data available to the program. However with the use of the state immunization registry, Children and Hoosier Immunization Registry Program (CHIRP), more information is now available and a methodology has been developed for assessing children by county for completion of the complete ACIP recommended childhood immunization series (4:3:1:3:3:1:4).

It is increasingly important to measure children for completion of the entire series of childhood vaccines, rather than focusing on one antigen. In assessing the complete series, we can assist in improving immunization rates for at least 10 different vaccine-preventable diseases in

one measure. Improving the rate of completion for the entire series of childhood vaccines in those age 19-35 months can protect children from disease such as; diphtheria, pertussis, tetanus, polio, measles, mumps, rubella, varicella, pneumococcal disease, and *Haemophilus influenzae*.

Providing a measure of how well protected children are in specific communities assists immunization programs throughout the state to identify areas of greatest need, and allow targeting of resources. This may result in improving immunization rates in Indiana, which ultimately will help reduce the incidence of morbidity and mortality due to vaccine-preventable diseases.

Methods

Immunization data by county was obtained by extracting raw data for the birth cohort from CHIRP. This data was filtered to include only those children who had an active immunization record, as defined by this assessment (see Data Dictionary). Additionally, access queries were used to correct any children's records that were missing a county, populating the county based on other fields, such as the city or zip code. When a child's city or zip code could not be used, the facility that administered the most recent vaccine was used to populate the county of residence for the child.

After completing this data "clean-up", the remaining children were assessed in CHIRP using a report that has been embedded in the application to measure the number of records complete for the 4:3:1:3:3:1:4 immunization series for each county. Data exported from CHIRP included the number of patients assessed defined as only those that had an active immunization record and were born within the birth cohort for the corresponding age range (19-35 months as of 3/31/2019). Exported data from CHIRP was then imported into a database and analyzed using a software program provided by the CDC, Comprehensive Clinic Assessment Software Application (CoCASA).

Immunizations were assessed for completion of series based on age range using an algorithm embedded in CoCASA for determining which patients had completed the series with

valid doses of each vaccine. The 19-35 month age range was assessed for completion of the 4:3:1:3:3:1:4 series as of 03/31/2019.

Assessment reports for each county were run using a template in CoCASA based on the imported data from CHIRP that contained the total number of patients assessed and the total number of patients complete for the corresponding vaccine series as of 03/31/2019.

Immunization rates by county were calculated by dividing the total number of patients that were complete for the series by the total number of patients assessed. The number of patients assessed includes only those that have an active immunization record and were born within the birth cohort for the corresponding age range.

Each county's cohort was assessed by VFC eligibility category, being either "VFC-Eligible", "Not VFC-Eligible", or "Underinsured" (see Data Dictionary for definitions of each category). Any child that was missing a VFC eligibility category code from CHIRP was included in the overall rate for the county, but was not included in a VFC eligibility category assessment.

The 4:3:1:3:3:1:4 immunization completion rate for the state of Indiana was calculated as a weighted average of the county rates, based on each county's cohort of children assessed (see Appendix C for a detailed standard operating procedure for conducting this assessment).

The total number of VFC providers by county (enrolled as April 15, 2019) was determined by exporting all provider data out of the Vaccine Tracking System (VTrckS), which is an application provided by CDC used to manage vaccine ordering and accountability.

Limitations

Provider's participation in the use of CHIRP for reporting immunizations was mandated in Indiana as of July 1, 2015, which means all medical providers in the State of Indiana who are authorized to administer immunizations must submit complete information to CHIRP within seven business days of administering an immunization to any patient 18 years of age and younger. However we have been notified that all providers are not compliant with entering data into CHIRP for various reasons. The data analyzed from CHIRP are considered to be

representative of the entire state; however, the true number of immunizations administered in Indiana remains unknown. Nonetheless, this assessment showed that from 2018 to 2019 there was an approximate decrease of 2052 immunization records assessed. See Table 3 for a detailed comparison between 2018 and 2019.

Upon breaking out the VFC eligibility categories among the cohort assessed, many were missing a VFC eligibility code from CHIRP. When missing, these children were still included in the county rate, but were not included in any eligibility category. Therefore, the rate among each VFC eligibility category is only representative of those children who had appropriate documentation of their VFC eligibility status in CHIRP at the time of the most recent vaccination. In the secondary methodology used, any child with a missing VFC eligibility code was included in the analysis for "Not Eligible for Publicly Funded Vaccines" category.

In the most recent NIS (National Immunization Survey) data from 2017, the overall immunization rate for the 4:3:1:3:3:1:4 series completion is 66.3% ± 7.6 among 19-35 month old children. The birth cohort for this data is January 2014 through May 2016. This estimate is lower than that provided in this report for Indiana, 70%. The methodology used to generate the data contained in this report differs greatly from that used for the NIS determination of the immunization rate. NIS uses a random digit dialing survey, and contains a total sample size of approximately 400 surveys. Subjects are only selected to be included in the survey if they permit the surveyor to obtain medical records and information to verify the survey responses. This presents a selection bias, as many individuals who are not up to date with vaccinations may refuse to give permission, as these records would then be excluded from the analysis. Additionally, any child whose immunization history cannot be verified is excluded from the analysis.

Results

The full results of this assessment can be found in the data table in Appendix A or an antigen breakdown can be found in Appendix C. A comparison between 2018 and 2019 immunization completion rates by county, number assessed and population represented can be found in Appendix B. Table 1 below summarizes the state average, weighted by county population assessed and lists the 10 counties with lowest rates. A summary of the number of VFC providers by county is also provided. Table 2 below displays the state average with the counties with the 10 highest rates. A summary of the number of VFC providers by county is also provided. Table 3 below summarizes 2018 and 2019 Indiana assessment overall.

Table 1: Ten Lowest Rates by County

COUNTY	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER OF VFC PROVIDERS ENROLLED
~INDIANA	**70%**	**742**
DAVIESS	49%	7
MARTIN	52%	1
LAGRANGE	55%	5
WELLS	56%	2
LAKE	58%	53
DEARBORN	58%	11
LAPORTE	59%	13
KNOX	59%	3
ALLEN	60%	28
GRANT	64%	7

Table 2: Ten Highest Rates by County

COUNTY	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER OF VFC PROVIDERS ENROLLED
INDIANA	**70%**	**742**
SPENCER	85%	2
PIKE	84%	2
MONROE	83%	5
OWEN	83%	3
GREENE	83%	3
GIBSON	82%	5
CASS	82%	4
LAWRENCE	82%	9
SHELBY	81%	2
WARRICK	81%	6

Table 3: Summary 2018 and 2019 Indiana Assessment

	2018	2019
Indiana completion rate for 4:3:1:3:3:1:4 series	67%	70%
Number assessed 19-35 months of age	110,687	108,635
Percentage of population represented	87%	86%
Number of VFC Providers	756	742
Number/ rate assessed by Not VFC-Eligible	46,137/ 72%	43,527/ 76%
Number/ rate assessed by Underinsured	579/ 69%	559/ 73%
Number/ rate assessed by VFC-Eligible	55,737/ 65%	56,933/ 67%

The average immunization rate in Indiana counties is 72%, and the median (or midpoint) is 73%. There were 50 out of 92 counties that fell above the average of 72%, 2 that were equal to the average, and 40 that were below the average of 72%.

Discussion

The result for Indiana's immunization rate for 2019 is 70% coverage among children age 19-35 months which increased 3% relative to the 2018 rate of 67%. The decrease in the number of children assessed and the percent of population represented could account for the increase in the overall rate.

According to 2017 US Census data by age, Indiana's population of 19-35 month old children should be approximately 126,979. After excluding any immunization records that were not considered to be "active", there were only 108,635 records assessed in this analysis. This represents 86% of the estimated population. The percentage of the population represented in Brown, Hancock, Hendricks, Jackson, Morgan and Pike counties all exceed 100%. This is thought to be attributable to an increase in children age 19-35 months whom relocated to these counties after 2017 as well as the two year difference between the census data and the data extracted from CHIRP for analysis of the rates.

Recommendations

Achieving high vaccination rates is attainable and progress among the 19-35 months age group series completion, has been seen among many counties. Additional efforts are needed to ensure that health-care providers administer recommended vaccinations and use each visit as an opportunity to ensure each child is fully vaccinated on time with every recommended vaccine. Also, rather than targeting efforts towards children already past due, health departments need to implement targeted provider education to confirm kids are vaccinated before they fall within 19-35 months of age. Reducing the number of missed opportunities, and vaccinating at the 15 month appointment would greatly improve vaccination rates as well as number of children who are behind.

Conclusions

The results of this analysis demonstrate the need for further investigation into identifying contributing factors which might explain why children are not completing the childhood vaccination series by 19 months of age. Further details of each county's data should be assessed on a case by case basis to find pockets of need.

It can be observed that the counties with the highest immunization rates also have some of the lowest numbers of VFC providers in the county. One reason for this may be that a fewer number of providers have more control over maintaining patient records and performing activities to increase the number of children who complete the immunization series. It should be noted, however, that there may be many disadvantages to limiting immunization services to few providers in an isolated area as this could create potential barriers to accessing healthcare.

Evidence-based approaches to increasing immunization should be utilized, such as targeting populations in need, and reminder-recall activities, which prompt the guardians of children missing immunizations to contact their medical providers.

APPENDIX A: 2019 Data Summary. Completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER OF VFC PROVIDERS ENROLLED	2017 (Census) POPULATION 19-35 MONTHS OF AGE	NUMBER ASSESSED 19-35 MONTHS OF AGE	PERCENTAGE OF POPULATION REPRESENTED	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER NOT VFC ELIGIBLE	RATE AMONG NOT VFC-ELIGIBLE	NUMBER UNDERINSURED	RATE AMONG UNDERINSURED	NUMBER VFC-ELIGIBLE	RATE AMONG VFC-ELIGIBLE
~INDIANA	**742**	**126,979**	**108,635**	**86%**	**70%**	**43,527**	**76%**	**559**	**73%**	**56,933**	**67%**
ADAMS	3	984	631	**64%**	66%	190	72%	2	100%	387	61%
ALLEN	28	7,978	6,774	**85%**	60%	2,296	64%	64	64%	3,685	55%
BARTHOLOMEW	6	1,578	1,525	**97%**	74%	583	78%	5	60%	574	73%
BENTON	1	172	119	**69%**	78%	47	91%	0	N/A	57	72%
BLACKFORD	1	219	162	**74%**	69%	44	68%	0	N/A	113	68%
BOONE	8	1,309	1,175	**90%**	78%	831	79%	13	77%	264	79%
BROWN	1	167	182	**109%**	73%	72	82%	1	0%	97	67%
CARROLL	3	315	271	**86%**	75%	122	84%	2	100%	125	64%
CASS	4	764	597	**78%**	82%	156	87%	8	88%	390	81%
CLARK	10	2,261	1,903	**84%**	68%	732	79%	1	100%	931	69%
CLAY	5	504	487	**97%**	78%	184	80%	1	100%	294	78%
CLINTON	4	696	626	**90%**	78%	226	81%	0	N/A	346	79%
CRAWFORD	2	183	131	**72%**	66%	51	73%	1	100%	75	60%
DAVIESS	7	832	660	**79%**	49%	146	75%	2	50%	510	42%
DEARBORN	11	806	566	**70%**	58%	291	57%	0	N/A	246	63%
DECATUR	7	505	467	**92%**	79%	229	89%	7	86%	207	69%
DEKALB	3	874	716	**82%**	70%	293	75%	2	100%	361	64%
DELAWARE	11	1,723	1,551	**90%**	75%	403	76%	5	60%	1,027	75%
DUBOIS	4	897	774	**86%**	70%	451	78%	4	100%	276	59%
ELKHART	33	4,705	3,854	**82%**	67%	1,337	72%	18	61%	2,464	66%
FAYETTE	3	365	316	**87%**	73%	87	85%	2	100%	219	69%
FLOYD	8	1,315	1,130	**86%**	73%	517	81%	5	100%	502	72%
FOUNTAIN	2	308	259	**84%**	74%	98	87%	0	N/A	143	67%
FRANKLIN	2	374	235	**63%**	75%	101	77%	1	100%	120	73%
FULTON	2	369	268	**73%**	79%	112	83%	8	100%	143	75%
GIBSON	5	631	528	**84%**	82%	314	87%	3	100%	205	76%

APPENDIX A: 2019 Data Summary. Completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER OF VFC PROVIDERS ENROLLED	2017 (Census) POPULATION 19-35 MONTHS OF AGE	NUMBER ASSESSED 19-35 MONTHS OF AGE	PERCENTAGE OF POPULATION REPRESENTED	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER NOT VFC ELIGIBLE	RATE AMONG NOT VFC-ELIGIBLE	NUMBER UNDERINSURED	RATE AMONG UNDERINSURED	NUMBER VFC-ELIGIBLE	RATE AMONG VFC-ELIGIBLE
GRANT	7	1,112	976	88%	64%	268	71%	16	75%	656	62%
GREENE	3	529	376	71%	83%	153	92%	0	N/A	221	76%
HAMILTON	24	6,470	5,701	88%	73%	4,158	73%	31	84%	1,070	77%
HANCOCK	6	1,316	1,329	101%	77%	737	82%	5	60%	334	73%
HARRISON	4	746	654	88%	72%	334	81%	3	100%	285	64%
HENDRICKS	9	2,860	2,880	101%	65%	1,109	65%	12	92%	885	76%
HENRY	6	696	664	95%	80%	234	86%	1	100%	380	77%
HOWARD	10	1,503	1,332	89%	71%	533	73%	12	67%	763	70%
HUNTINGTON	4	618	595	96%	64%	266	65%	11	45%	293	68%
JACKSON	3	848	853	101%	67%	329	64%	9	78%	436	70%
JASPER	2	594	507	85%	73%	233	80%	20	70%	235	67%
JAY	4	473	317	67%	68%	112	73%	4	100%	196	63%
JEFFERSON	2	557	541	97%	77%	215	81%	1	0%	316	75%
JENNINGS	2	528	407	77%	77%	145	78%	1	100%	229	76%
JOHNSON	21	3,038	2,648	87%	76%	1,361	80%	10	80%	1,183	73%
KNOX	3	643	384	60%	59%	161	68%	4	75%	215	53%
KOSCIUSKO	6	1,621	1,204	74%	65%	591	70%	11	64%	582	61%
LAGRANGE	5	1,105	548	50%	55%	120	61%	0	N/A	415	53%
LAKE	53	8,822	7,334	83%	58%	2,680	71%	29	66%	4,381	51%
LAPORTE	13	1,994	1,820	91%	59%	656	77%	3	100%	1,137	49%
LAWRENCE	9	781	661	85%	82%	262	87%	1	100%	396	79%
MADISON	25	2,218	1,977	89%	79%	627	81%	3	67%	1,276	79%
MARION	107	21,030	18,120	86%	69%	5,167	73%	74	69%	11,108	70%
MARSHALL	10	914	739	81%	68%	305	75%	7	43%	420	64%
MARTIN	1	202	193	96%	52%	61	72%	3	100%	125	42%
MIAMI	3	555	455	82%	73%	184	72%	5	60%	255	74%
MONROE	5	2,028	1,663	82%	83%	919	87%	3	100%	732	79%

APPENDIX A: 2019 Data Summary. Completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER OF VFC PROVIDERS ENROLLED	2017 (Census) POPULATION 19-35 MONTHS OF AGE	NUMBER ASSESSED 19-35 MONTHS OF AGE	PERCENTAGE OF POPULATION REPRESENTED	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER NOT VFC ELIGIBLE	RATE AMONG NOT VFC-ELIGIBLE	NUMBER UNDERINSURED	RATE AMONG UNDERINSURED	NUMBER VFC-ELIGIBLE	RATE AMONG VFC-ELIGIBLE
MONTGOMERY	6	721	604	**84%**	79%	251	82%	3	67%	309	77%
MORGAN	8	1,175	1,242	**106%**	76%	524	83%	6	67%	626	72%
NEWTON	1	234	159	**68%**	71%	61	79%	1	0%	90	67%
NOBLE	2	991	758	**76%**	69%	289	76%	10	80%	433	64%
OHIO	2	82	80	**98%**	66%	37	78%	0	N/A	38	55%
ORANGE	3	332	331	**100%**	66%	108	73%	6	50%	210	65%
OWEN	3	331	245	**74%**	83%	95	86%	0	N/A	147	82%
PARKE	4	317	181	**57%**	70%	62	74%	0	N/A	111	68%
PERRY	2	345	239	**69%**	69%	92	70%	2	100%	138	69%
PIKE	2	216	231	**107%**	84%	132	87%	2	100%	93	80%
PORTER	11	2,737	2,272	**83%**	70%	1,310	77%	12	42%	864	61%
POSEY	4	438	323	**74%**	78%	205	85%	0	N/A	117	64%
PULASKI	2	206	181	**88%**	70%	59	85%	0	N/A	112	63%
PUTNAM	5	554	450	**81%**	73%	113	65%	2	100%	238	76%
RANDOLPH	3	452	377	**83%**	68%	123	70%	3	67%	235	69%
RIPLEY	3	495	448	**91%**	77%	245	85%	2	50%	182	67%
RUSH	5	287	247	**86%**	79%	69	84%	2	50%	141	73%
STJOSEPH	38	5,202	4,728	**91%**	65%	1,888	71%	12	83%	2,735	61%
SCOTT	4	419	351	**84%**	74%	111	83%	3	67%	219	72%
SHELBY	2	781	753	**96%**	81%	174	83%	4	75%	441	82%
SPENCER	2	340	214	**63%**	85%	102	83%	6	100%	103	85%
STARKE	7	428	323	**75%**	64%	109	79%	0	N/A	210	57%
STEUBEN	4	576	450	**78%**	67%	192	76%	0	N/A	250	60%
SULLIVAN	4	330	299	**91%**	69%	118	77%	2	100%	176	63%
SWITZERLAND	1	205	113	**55%**	64%	33	73%	0	N/A	76	59%
TIPPECANOE	17	3,514	3,122	**89%**	76%	1,302	82%	17	76%	1,425	73%
TIPTON	1	234	199	**85%**	76%	95	77%	1	100%	88	80%

APPENDIX A: 2019 Data Summary. Completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER OF VFC PROVIDERS ENROLLED	2017 (Census) POPULATION 19-35 MONTHS OF AGE	NUMBER ASSESSED 19-35 MONTHS OF AGE	PERCENTAGE OF POPULATION REPRESENTED	COMPLETION RATE FOR 4:3:1:3:3:1:4	NUMBER NOT VFC ELIGIBLE	RATE AMONG NOT VFC-ELIGIBLE	NUMBER UNDERINSURED	RATE AMONG UNDERINSURED	NUMBER VFC-ELIGIBLE	RATE AMONG VFC-ELIGIBLE
UNION	1	129	62	**48%**	76%	18	72%	0	N/A	43	79%
VANDERBURGH	20	3,208	2,874	**90%**	79%	1,295	86%	5	60%	1,527	74%
VERMILLION	4	235	210	**89%**	76%	70	84%	0	N/A	138	72%
VIGO	17	1,862	1,621	**87%**	72%	611	77%	8	88%	979	70%
WABASH	3	498	418	**84%**	69%	146	78%	3	67%	255	65%
WARREN	2	133	121	**91%**	79%	56	86%	0	N/A	51	76%
WARRICK	6	1,132	879	**78%**	81%	563	87%	3	33%	300	71%
WASHINGTON	5	483	371	**77%**	75%	134	77%	1	100%	222	75%
WAYNE	6	1,170	970	**83%**	77%	274	84%	0	N/A	658	76%
WELLS	2	497	452	**91%**	56%	204	58%	2	100%	223	57%
WHITE	5	446	437	**98%**	78%	168	85%	2	100%	230	73%
WHITLEY	4	609	515	**85%**	75%	256	78%	5	80%	215	72%

APPENDIX B. Immunization series completion rate for 4:3:1:3:3:1:4 among children aged 19-35 months, by county, number assessed, population represented, 2018 & 2019

			Number Assessed 19-35 Months of Age			Percentage of Population Represented			Completion Rate for 4:3:1:3:3:1:4	
COUNTY	(2017 Census) POPULATION 19-35 MONTHS OF AGE		2018	2019		2018	2019		2018	2019
~INDIANA	**126,979**		**110,687**	**108,635**		**87%**	**86%**		**67%**	**70%**
ADAMS	984		665	631		68%	64%		60%	66%
ALLEN	7978		6,830	6,774		86%	85%		58%	60%
BARTHOLOMEW	1578		1,524	1,525		97%	97%		76%	74%
BENTON	172		129	119		75%	69%		78%	78%
BLACKFORD	219		177	162		81%	74%		65%	69%
BOONE	1309		1,213	1,175		93%	90%		74%	78%
BROWN	167		184	182		110%	109%		75%	73%
CARROLL	315		268	271		85%	86%		68%	75%
CASS	764		618	597		81%	78%		82%	82%
CLARK	2261		1,966	1,903		87%	84%		67%	68%
CLAY	504		506	487		100%	97%		72%	78%
CLINTON	696		564	626		81%	90%		73%	78%
CRAWFORD	183		104	131		57%	72%		56%	66%
DAVIESS	832		613	660		74%	79%		53%	49%
DEARBORN	806		588	566		73%	70%		54%	58%
DECATUR	505		459	467		91%	92%		73%	79%
DEKALB	874		709	716		81%	82%		69%	70%
DELAWARE	1723		1,545	1,551		90%	90%		72%	75%
DUBOIS	897		779	774		87%	86%		71%	70%
ELKHART	4705		3,862	3,854		82%	82%		63%	67%
FAYETTE	365		287	316		79%	87%		70%	73%
FLOYD	1315		1,230	1,130		94%	86%		71%	73%
FOUNTAIN	308		232	259		75%	84%		66%	74%

APPENDIX B. Immunization series completion rate for 4:3:1:3:3:1:4 among children aged 19-35 months, by county, number assessed, population represented, 2018 & 2019

			Number Assessed 19-35 Months of Age			Percentage of Population Represented			Completion Rate for 4:3:1:3:3:1:4	
COUNTY	(2017 Census) POPULATION 19-35 MONTHS OF AGE		2018	2019		2018	2019		2018	2019
FRANKLIN	374		216	235		58%	63%		73%	75%
FULTON	369		315	268		85%	73%		67%	79%
GIBSON	631		541	528		86%	84%		80%	82%
GRANT	1112		958	976		86%	88%		59%	64%
GREENE	529		363	376		69%	71%		80%	83%
HAMILTON	6470		5,641	5,701		87%	88%		66%	73%
HANCOCK	1316		1,283	1,329		97%	101%		71%	77%
HARRISON	746		625	654		84%	88%		66%	72%
HENDRICKS	2860		2,876	2,880		101%	101%		60%	65%
HENRY	696		651	664		94%	95%		79%	80%
HOWARD	1503		1,360	1,332		90%	89%		72%	71%
HUNTINGTON	618		596	595		96%	96%		62%	64%
JACKSON	848		835	853		98%	101%		63%	67%
JASPER	594		480	507		81%	85%		71%	73%
JAY	473		352	317		74%	67%		72%	68%
JEFFERSON	557		533	541		96%	97%		75%	77%
JENNINGS	528		433	407		82%	77%		76%	77%
JOHNSON	3038		2,687	2,648		88%	87%		74%	76%
KNOX	643		510	384		79%	60%		65%	59%
KOSCIUSKO	1621		1,217	1,204		75%	74%		65%	65%
LAGRANGE	1105		632	548		57%	50%		49%	55%
LAKE	8822		7,683	7,334		87%	83%		58%	58%
LAPORTE	1994		1,820	1,820		91%	91%		60%	59%
LAWRENCE	781		652	661		83%	85%		84%	82%

APPENDIX B. Immunization series completion rate for 4:3:1:3:3:1:4 among children aged 19-35 months, by county, number assessed, population represented, 2018 & 2019

			Number Assessed 19-35 Months of Age			Percentage of Population Represented			Completion Rate for 4:3:1:3:3:1:4	
COUNTY	(2017 Census) POPULATION 19-35 MONTHS OF AGE		2018	2019		2018	2019		2018	2019
MADISON	2218		2,032	1,977		92%	89%		76%	79%
MARION	21030		18,592	18,120		88%	86%		67%	69%
MARSHALL	914		801	739		88%	81%		68%	68%
MARTIN	202		193	193		96%	96%		54%	52%
MIAMI	555		429	455		77%	82%		74%	73%
MONROE	2028		1,734	1,663		86%	82%		83%	83%
MONTGOMERY	721		592	604		82%	84%		74%	79%
MORGAN	1175		1,239	1,242		105%	106%		74%	76%
NEWTON	234		195	159		83%	68%		66%	71%
NOBLE	991		794	758		80%	76%		66%	69%
OHIO	82		112	80		137%	98%		71%	66%
ORANGE	332		317	331		95%	100%		72%	66%
OWEN	331		260	245		79%	74%		80%	83%
PARKE	317		211	181		67%	57%		70%	70%
PERRY	345		240	239		70%	69%		76%	69%
PIKE	216		227	231		105%	107%		78%	84%
PORTER	2737		2,365	2,272		86%	83%		67%	70%
POSEY	438		346	323		79%	74%		75%	78%
PULASKI	206		167	181		81%	88%		69%	70%
PUTNAM	554		489	450		88%	81%		68%	73%
RANDOLPH	452		352	377		78%	83%		68%	68%
RIPLEY	495		448	448		91%	91%		78%	77%
RUSH	287		230	247		80%	86%		79%	79%
STJOSEPH	5202		4,766	4,728		92%	91%		59%	65%

APPENDIX B. Immunization series completion rate for 4:3:1:3:3:1:4 among children aged 19-35 months, by county, number assessed, population represented, 2018 & 2019

			Number Assessed 19-35 Months of Age			Percentage of Population Represented			Completion Rate for 4:3:1:3:3:1:4	
COUNTY	(2017 Census) POPULATION 19-35 MONTHS OF AGE		2018	2019		2018	2019		2018	2019
SCOTT	419		358	351		85%	84%		71%	74%
SHELBY	781		720	753		92%	96%		78%	81%
SPENCER	340		213	214		63%	63%		84%	85%
STARKE	428		322	323		75%	75%		63%	64%
STEUBEN	576		505	450		88%	78%		62%	67%
SULLIVAN	330		279	299		85%	91%		68%	69%
SWITZERLAND	205		125	113		61%	55%		69%	64%
TIPPECANOE	3514		3,311	3,122		94%	89%		74%	76%
TIPTON	234		195	199		83%	85%		76%	76%
UNION	129		59	62		46%	48%		75%	76%
VANDERBURGH	3208		2,975	2,874		93%	90%		77%	79%
VERMILLION	235		213	210		91%	89%		71%	76%
VIGO	1862		1,651	1,621		89%	87%		67%	72%
WABASH	498		451	418		91%	84%		65%	69%
WARREN	133		121	121		91%	91%		76%	79%
WARRICK	1132		1,009	879		89%	78%		81%	81%
WASHINGTON	483		372	371		77%	77%		71%	75%
WAYNE	1170		935	970		80%	83%		79%	77%
WELLS	497		461	452		93%	91%		65%	56%
WHITE	446		427	437		96%	98%		77%	78%
WHITLEY	609		543	515		89%	85%		72%	75%

APPENDIX C: 2019 Data Summary. Antigen completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER ASSESSED 19-35 MONTHS OF AGE	4 Dtap	4 Dtap RATE	3 Polio	3 Polio RATE	1 MMR	1 MMR RATE	3 Hib	3 Hib RATE	3 Hep B	3 Hep B RATE	1 VAR	1 VAR RATE	4 PCV	4 PCV RATE	COMPLETION 4:3:1:3:3:1:4	COMPLETION RATE FOR 4:3:1:3:3:1:4
~INDIANA	**108,635**	**81,994**	**75%**	**97,839**	**90%**	**96,188**	**89%**	**99,328**	**91%**	**95,144**	**88%**	**95,241**	**88%**	**91,275**	**84%**	**75,771**	**70%**
ADAMS	631	468	74%	580	92%	565	90%	561	89%	529	84%	534	85%	507	80%	414	66%
ALLEN	6,774	4,631	68%	5,884	87%	5,822	86%	6,073	90%	5,523	82%	5,776	85%	5,446	80%	4,055	60%
BARTHOLOMEW	1,525	1,228	81%	1,405	92%	1,360	89%	1,452	95%	1,346	88%	1,337	88%	1,336	88%	1,133	74%
BENTON	119	99	83%	112	94%	108	91%	115	97%	109	92%	109	92%	106	89%	93	78%
BLACKFORD	162	121	75%	147	91%	143	88%	148	91%	145	90%	140	86%	138	85%	111	69%
BOONE	1,175	969	82%	1,063	90%	1,068	91%	1,084	92%	1,033	88%	1,065	91%	1,042	89%	911	78%
BROWN	182	143	79%	167	92%	160	88%	167	92%	159	87%	159	87%	155	85%	132	73%
CARROLL	271	207	76%	254	94%	244	90%	254	94%	256	94%	237	87%	235	87%	202	75%
CASS	597	499	84%	567	95%	561	94%	564	94%	575	96%	558	93%	534	89%	490	82%
CLARK	1,903	1,476	78%	1,726	91%	1,724	91%	1,798	94%	1,540	81%	1,714	90%	1,629	86%	1,296	68%
CLAY	487	394	81%	457	94%	450	92%	462	95%	465	95%	451	93%	437	90%	381	78%
CLINTON	626	508	81%	559	89%	572	91%	571	91%	568	91%	569	91%	560	89%	487	78%
CRAWFORD	131	94	72%	119	91%	116	89%	122	93%	117	89%	115	88%	110	84%	87	66%
DAVIESS	660	446	68%	583	88%	582	88%	575	87%	580	88%	417	63%	460	70%	325	49%
DEARBORN	566	369	65%	478	84%	429	76%	497	88%	445	79%	431	76%	432	76%	330	58%
DECATUR	467	381	82%	434	93%	431	92%	431	92%	431	92%	425	91%	410	88%	368	79%
DEKALB	716	534	75%	640	89%	633	88%	653	91%	641	90%	625	87%	600	84%	504	70%
DELAWARE	1,551	1,221	79%	1,414	91%	1,424	92%	1,417	91%	1,428	92%	1,427	92%	1,346	87%	1,165	75%
DUBOIS	774	593	77%	720	93%	691	89%	731	94%	686	89%	687	89%	653	84%	542	70%
ELKHART	3,854	2,801	73%	3,441	89%	3,367	87%	3,545	92%	3,308	86%	3,332	86%	3,164	82%	2,599	67%
FAYETTE	316	239	76%	291	92%	280	89%	282	89%	290	92%	279	88%	256	81%	232	73%
FLOYD	1,130	910	81%	1,053	93%	1,039	92%	1,076	95%	993	88%	1,039	92%	1,020	90%	829	73%
FOUNTAIN	259	207	80%	245	95%	239	92%	240	93%	238	92%	238	92%	224	86%	192	74%
FRANKLIN	235	183	78%	217	92%	214	91%	222	94%	218	93%	217	92%	201	86%	176	75%
FULTON	268	219	82%	257	96%	253	94%	259	97%	256	96%	249	93%	237	88%	212	79%
GIBSON	528	456	86%	503	95%	492	93%	506	96%	507	96%	495	94%	476	90%	435	82%
GRANT	976	688	70%	846	87%	859	88%	901	92%	846	87%	862	88%	792	81%	620	64%
GREENE	376	322	86%	356	95%	346	92%	357	95%	354	94%	347	92%	338	90%	311	83%
HAMILTON	5,701	4,582	80%	5,164	91%	5,187	91%	5,365	94%	4,870	85%	5,178	91%	4,919	86%	4,163	73%
HANCOCK	1,329	1,121	84%	1,258	95%	1,249	94%	1,293	97%	1,183	89%	1,252	94%	1,217	92%	1,026	77%
HARRISON	654	514	79%	620	95%	613	94%	621	95%	582	89%	606	93%	573	88%	469	72%
HENDRICKS	2,880	2,019	70%	2,472	86%	2,372	82%	2,562	89%	2,480	86%	2,360	82%	2,272	79%	1,862	65%
HENRY	664	551	83%	626	94%	630	95%	629	95%	626	94%	629	95%	581	88%	534	80%

APPENDIX C: 2019 Data Summary. Antigen completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER ASSESSED 19-35 MONTHS OF AGE	4 Dtap	4 Dtap RATE	3 Polio	3 Polio RATE	1 MMR	1 MMR RATE	3 Hib	3 Hib RATE	3 Hep B	3 Hep B RATE	1 VAR	1 VAR RATE	4 PCV	4 PCV RATE	COMPLETION 4:3:1:3:3:1:4	COMPLETION RATE FOR 4:3:1:3:3:1:4
HOWARD	1,332	996	75%	1,214	91%	1,208	91%	1,177	88%	1,216	91%	1,206	91%	1,143	86%	941	71%
HUNTINGTON	595	452	76%	541	91%	536	90%	547	92%	470	79%	532	89%	516	87%	380	64%
JACKSON	853	662	78%	773	91%	763	89%	803	94%	707	83%	733	86%	718	84%	574	67%
JASPER	507	402	79%	462	91%	447	88%	472	93%	446	88%	454	90%	433	85%	372	73%
JAY	317	232	73%	293	92%	284	90%	290	91%	284	90%	277	87%	263	83%	214	68%
JEFFERSON	541	440	81%	513	95%	506	94%	513	95%	515	95%	504	93%	452	84%	417	77%
JENNINGS	407	332	82%	384	94%	375	92%	374	92%	377	93%	377	93%	355	87%	313	77%
JOHNSON	2,648	2,191	83%	2,441	92%	2,434	92%	2,528	95%	2,296	87%	2,404	91%	2,358	89%	2,008	76%
KNOX	384	245	64%	331	86%	319	83%	325	85%	337	88%	314	82%	293	76%	227	59%
KOSCIUSKO	1,204	852	71%	1,077	89%	1,049	87%	1,109	92%	1,057	88%	1,031	86%	982	82%	786	65%
LAGRANGE	548	325	59%	461	84%	460	84%	490	89%	434	79%	442	81%	409	75%	299	55%
LAKE	7,334	4,878	67%	6,161	84%	6,072	83%	6,421	88%	5,882	80%	5,972	81%	5,538	76%	4,240	58%
LAPORTE	1,820	1,180	65%	1,592	87%	1,570	86%	1,634	90%	1,506	83%	1,494	82%	1,472	81%	1,075	59%
LAWRENCE	661	555	84%	620	94%	617	93%	632	96%	634	96%	610	92%	615	93%	542	82%
MADISON	1,977	1,615	82%	1,849	94%	1,804	91%	1,837	93%	1,835	93%	1,795	91%	1,719	87%	1,554	79%
MARION	18,120	13,487	74%	16,208	89%	15,949	88%	16,205	89%	15,995	88%	15,863	88%	15,007	83%	12,555	69%
MARSHALL	739	543	73%	663	90%	653	88%	685	93%	645	87%	648	88%	604	82%	501	68%
MARTIN	193	129	67%	179	93%	169	88%	175	91%	175	91%	123	64%	149	77%	100	52%
MIAMI	455	351	77%	419	92%	407	89%	426	94%	423	93%	407	89%	396	87%	331	73%
MONROE	1,663	1,423	86%	1,584	95%	1,517	91%	1,563	94%	1,588	95%	1,506	91%	1,552	93%	1,388	83%
MONTGOMERY	604	499	83%	551	91%	552	91%	563	93%	541	90%	553	92%	534	88%	475	79%
MORGAN	1,242	996	80%	1,157	93%	1,112	90%	1,168	94%	1,125	91%	1,100	89%	1,106	89%	939	76%
NEWTON	159	124	78%	144	91%	142	89%	149	94%	138	87%	144	91%	130	82%	113	71%
NOBLE	758	550	73%	689	91%	659	87%	704	93%	677	89%	656	87%	635	84%	523	69%
OHIO	80	57	71%	68	85%	62	78%	70	88%	72	90%	65	81%	64	80%	53	66%
ORANGE	331	232	70%	291	88%	281	85%	303	92%	295	89%	283	85%	272	82%	220	66%
OWEN	245	210	86%	237	97%	225	92%	232	95%	235	96%	221	90%	229	93%	204	83%
PARKE	181	138	76%	165	91%	159	88%	167	92%	167	92%	158	87%	148	82%	127	70%
PERRY	239	167	70%	225	94%	215	90%	199	83%	221	92%	217	91%	192	80%	164	69%
PIKE	231	203	88%	222	96%	218	94%	223	97%	217	94%	218	94%	207	90%	194	84%
PORTER	2,272	1,720	76%	2,074	91%	2,034	90%	2,108	93%	1,989	88%	1,981	87%	1,950	86%	1,592	70%
POSEY	323	270	84%	308	95%	300	93%	302	93%	299	93%	300	93%	282	87%	251	78%
PULASKI	181	133	73%	157	87%	157	87%	154	85%	162	90%	156	86%	141	78%	126	70%
PUTNAM	450	340	76%	403	90%	397	88%	408	91%	409	91%	389	86%	385	86%	328	73%

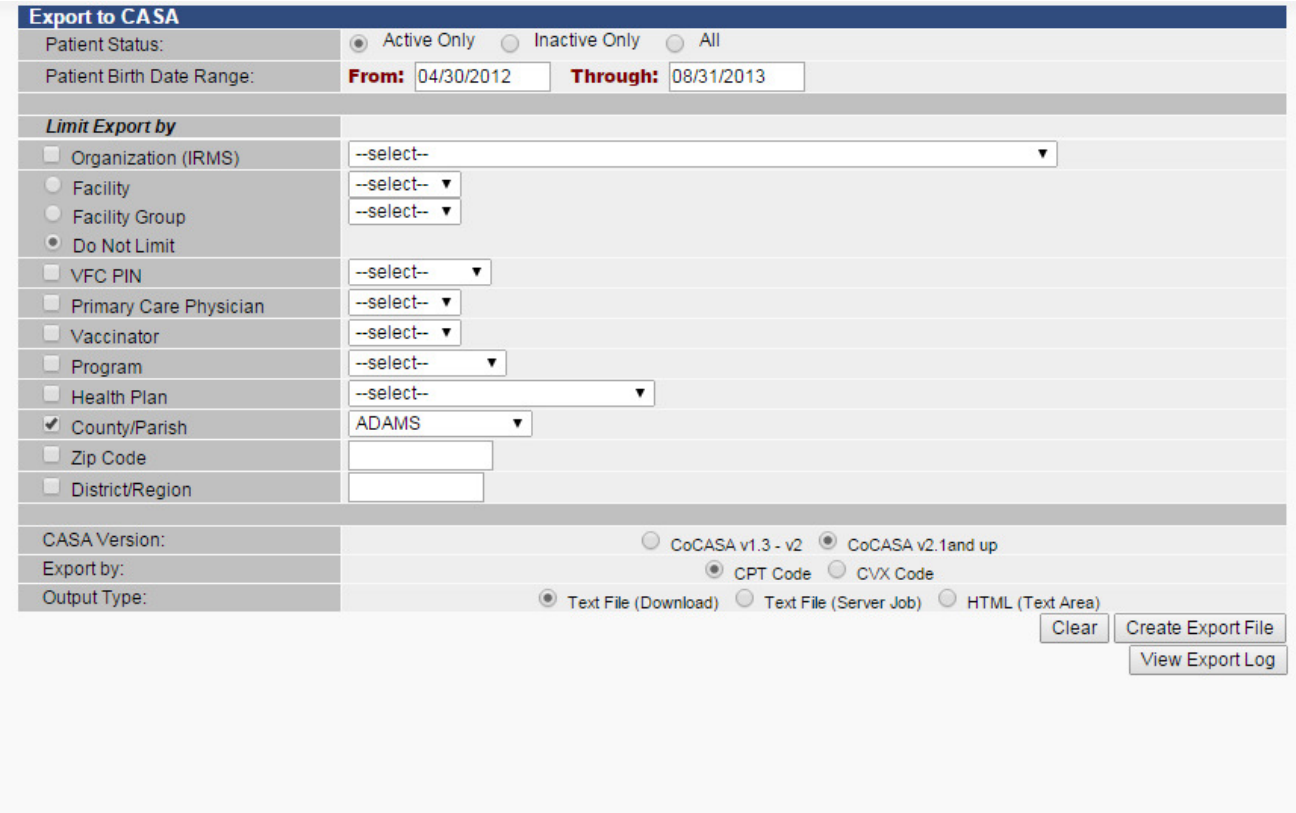
APPENDIX C: 2019 Data Summary. Antigen completion rate of 4:3:1:3:3:1:4 immunization series among children 19-35 month with an active immunization record in CHIRP

COUNTY	NUMBER ASSESSED 19-35 MONTHS OF AGE	4 Dtap	4 Dtap RATE	3 Polio	3 Polio RATE	1 MMR	1 MMR RATE	3 Hib	3 Hib RATE	3 Hep B	3 Hep B RATE	1 VAR	1 VAR RATE	4 PCV	4 PCV RATE	COMPLETION 4:3:1:3:3:1:4	COMPLETION RATE FOR 4:3:1:3:3:1:4
RANDOLPH	377	270	72%	342	91%	335	89%	321	85%	348	92%	337	89%	315	84%	257	68%
RIPLEY	448	359	80%	414	92%	403	90%	420	94%	415	93%	401	90%	395	88%	343	77%
RUSH	247	201	81%	234	95%	234	95%	241	98%	233	94%	229	93%	232	94%	194	79%
STJOSEPH	4,728	3,304	70%	4,104	87%	4,079	86%	4,186	89%	4,029	85%	4,076	86%	3,882	82%	3,052	65%
SCOTT	351	280	80%	321	91%	311	89%	324	92%	311	89%	308	88%	300	85%	261	74%
SHELBY	753	658	87%	715	95%	701	93%	725	96%	683	91%	697	93%	698	93%	612	81%
SPENCER	214	186	87%	208	97%	208	97%	212	99%	204	95%	208	97%	197	92%	181	85%
STARKE	323	219	68%	285	88%	275	85%	298	92%	293	91%	268	83%	258	80%	207	64%
STEUBEN	450	311	69%	396	88%	386	86%	402	89%	394	88%	378	84%	375	83%	303	67%
SULLIVAN	299	219	73%	269	90%	268	90%	275	92%	274	92%	272	91%	247	83%	206	69%
SWITZERLAND	113	79	70%	94	83%	91	81%	98	87%	95	84%	89	79%	83	73%	72	64%
TIPPECANOE	3,122	2,484	80%	2,858	92%	2,784	89%	2,915	93%	2,829	91%	2,763	89%	2,709	87%	2,371	76%
TIPTON	199	157	79%	183	92%	183	92%	188	94%	179	90%	183	92%	178	89%	151	76%
UNION	62	48	77%	55	89%	53	85%	55	89%	57	92%	54	87%	52	84%	47	76%
VANDERBURGH	2,874	2,374	83%	2,708	94%	2,640	92%	2,649	92%	2,702	94%	2,640	92%	2,550	89%	2,275	79%
VERMILLION	210	167	80%	199	95%	194	92%	196	93%	201	96%	192	91%	186	89%	160	76%
VIGO	1,621	1,208	75%	1,469	91%	1,429	88%	1,469	91%	1,487	92%	1,423	88%	1,405	87%	1,169	72%
WABASH	418	320	77%	381	91%	370	89%	389	93%	363	87%	370	89%	343	82%	287	69%
WARREN	121	99	82%	114	94%	115	95%	115	95%	115	95%	114	94%	110	91%	95	79%
WARRICK	879	750	85%	831	95%	789	90%	834	95%	815	93%	786	89%	765	87%	709	81%
WASHINGTON	371	297	80%	347	94%	334	90%	353	95%	339	91%	334	90%	319	86%	279	75%
WAYNE	970	771	79%	889	92%	863	89%	854	88%	886	91%	862	89%	816	84%	748	77%
WELLS	452	327	72%	413	91%	395	87%	416	92%	338	75%	394	87%	356	79%	255	56%
WHITE	437	357	82%	406	93%	392	90%	411	94%	399	91%	395	90%	379	87%	339	78%
WHITLEY	515	427	83%	490	95%	481	93%	493	96%	459	89%	476	92%	470	91%	386	75%

APPENDIX D: Standard Operating Procedure (SOP) for Performing County Rate Assessment

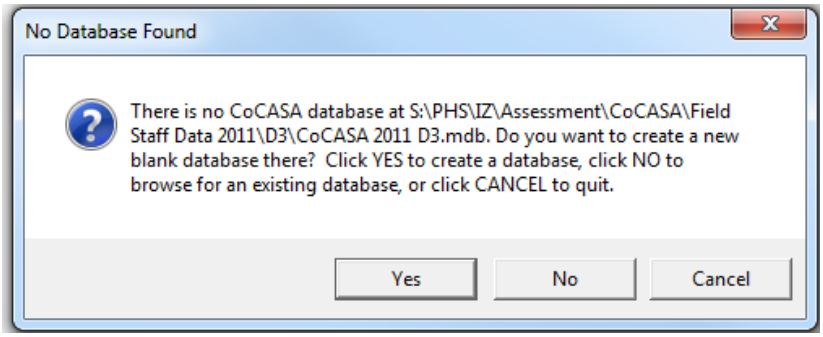
1. Create and save a 'CoCASA Export File' from CHIRP for each county.
    a. Login to CHIRP, click "CASA Export" from the left sidebar.
    b. Enter the patient date of birth range.
    c. Select the county.
    d. Leave all other settings at their default state, and click "Create Export File".
        i. The default settings should be:
            1. CoCASA Version: CoCASA v2.1 and up,
            2. Export by: CPT code,
            3. Output Type: Text File (Download)
    e. After export file has generated, save the file named for the county exported.

Figure 1



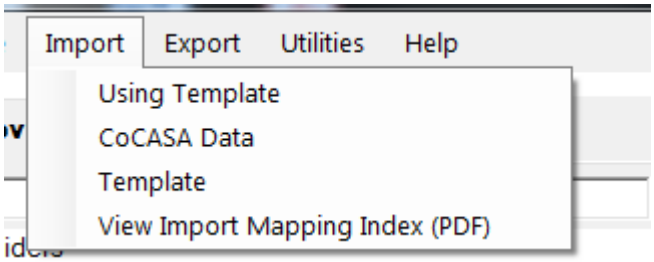
2. Import each export file into a new, blank CoCASA database.
    a. Rename an existing CoCASA database. Then, open CoCASA. A message will appear as shown below:

Figure 2



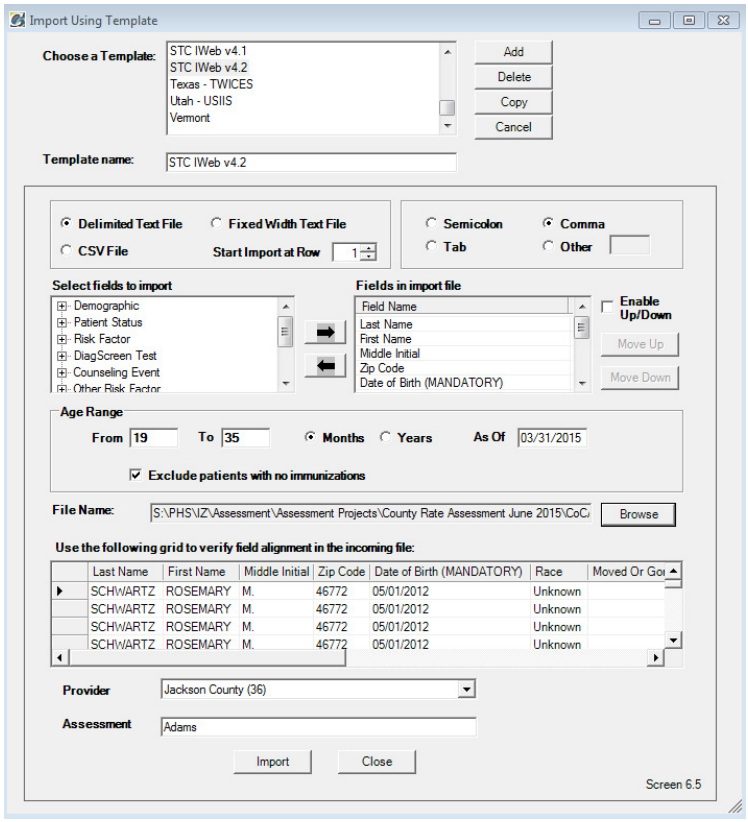
b. Click "Yes" on the dialog box to create a new blank database. Name the new database for the assessment it is being created for.
c. Open CoCASA, directing it toward the new database created for the assessment.
d. Set up a provider named "County Rate Assessment" with the address and phone number for ISDH.
e. Click on File, Import, Using Template.

Figure 3



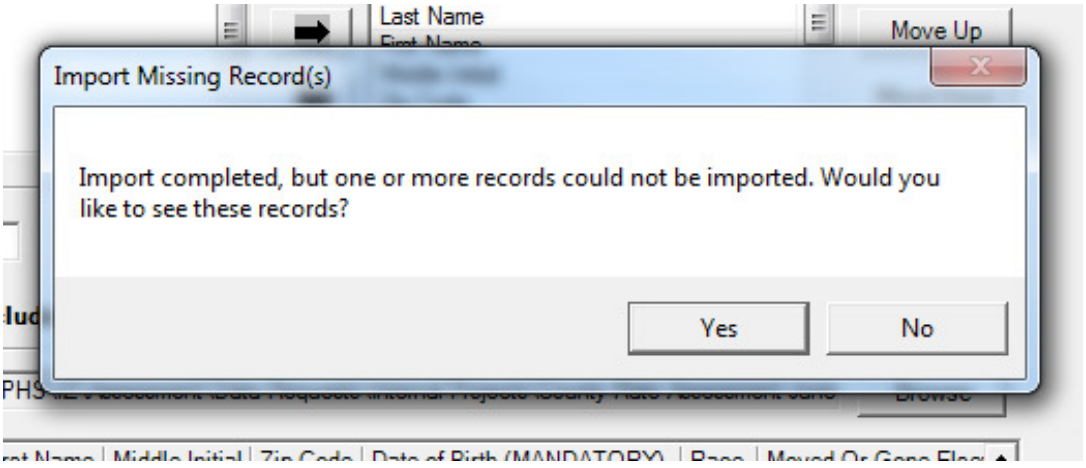
f. Choose the template to import from, STC IWeb v4.2.
g. Enter the date of birth range for the cohort, including the "as of" date, indicating what age the subjects should be at the time of assessment.
h. Click on "Exclude patients with no immunizations".
i. Click "Browse" and select the file saved for the county being imported.
j. Choose the provider "County Rate Assessment", and enter the county name for "Assessment".
k. Click "Import".

Figure 4



l. After the records have finished importing, if there was at least one record excluded, the following message will display:

Figure 4



m. Click Yes, then save the text file for later reference. This can be used in working with CHIRP staff to "clean up" the data.
n. Complete all steps for each county in the state.

3. Make a copy of the complete database after importing all county export files.
4. Open the Access database that contains the county assessment data.
   a. Double click the file in Windows Explorer.

b. Upon opening, you will be prompted to enter a password, enter “COCASAnip”. This is case-sensitive.

5. Exclude patients from the patient table that do not have 2 or more vaccines excluding influenza.
   a. First, run a query to create a new “tblDoses” table containing all doses excluding influenza. (copy and paste the SQL script shown in Figure 6)
      i. The vaccine code for the influenza family is “11”.
      ii. Run the query, naming the table “tblDosesNoFlu”.

Figure 6

```
SELECT tblDoses.AntigenID, tblDoses.DateGiven, tblDoses.DoseNumber, tblDoses.Location,
tblDoses.LotNumber, tblDoses.ManufacturerID, tblDoses.PatientID, tblDoses.TradeNameID INTO
tblDosesNoFlu
FROM tblDoses
GROUP BY tblDoses.AntigenID, tblDoses.DateGiven, tblDoses.DoseNumber, tblDoses.Location,
tblDoses.LotNumber, tblDoses.ManufacturerID, tblDoses.PatientID, tblDoses.TradeNameID
HAVING (((tblDoses.AntigenID) Not Like "11"));
```

   b. Next, run another query to create a new “tblDoses” table containing all doses excluding those for patients with fewer than 2 vaccines (excluding flu). (copy and paste the SQL script shown in Figure 7)
   c. Run the query, naming the table “tblDosesNoFlu2ormore”

NOTE: THIS QUERY WILL TAKE APPROXIMATELY 48 HOURS TO RUN

Figure 7

```
SELECT tblDosesNoFlu.AntigenID, tblDosesNoFlu.DateGiven, tblDosesNoFlu.DoseNumber,
tblDosesNoFlu.Location, tblDosesNoFlu.LotNumber, tblDosesNoFlu.ManufacturerID,
tblDosesNoFlu.PatientID, tblDosesNoFlu.TradeNameID INTO tblDosesNoFlu2ormore
FROM tblDosesNoFlu
GROUP BY tblDosesNoFlu.AntigenID, tblDosesNoFlu.DateGiven, tblDosesNoFlu.DoseNumber,
tblDosesNoFlu.Location, tblDosesNoFlu.LotNumber, tblDosesNoFlu.ManufacturerID,
tblDosesNoFlu.PatientID, tblDosesNoFlu.TradeNameID
HAVING (((tblDosesNoFlu.PatientID) In (SELECT [PatientID] FROM [tblDoses] As Tmp GROUP
BY [PatientID] HAVING Count(*)>1 )));
```

   d. Now create a new table for unique patient IDs contained in the “tblDosesNoFlu2ormore” table.
      i. Copy and paste the SQL script shown in Figure 8.
      ii. Run the query, naming the table “tblUniquePatients”

Figure 8

```
SELECT DISTINCTROW tblDosesNoFlu2ormore.PatientID INTO tblUniquePatients
FROM tblDosesNoFlu2ormore
GROUP BY tblDosesNoFlu2ormore.PatientID;
```

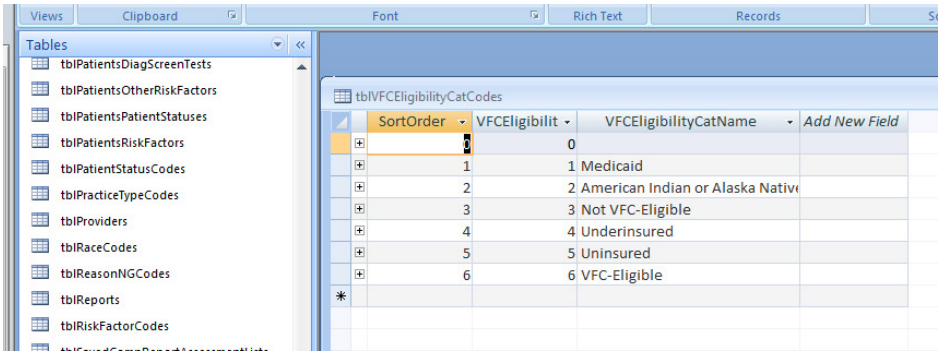
e. Finally, run a delete query to delete the patient records from the "tblPatients" table that are not contained in the unique patients table.
   i. Copy and paste the SQL script shown in Figure 9.
   ii. Run the query, this will update the "tblPatients" table by deleting those not contained in tblUniquePatients.

Figure 9

```
DELETE Delete AS Expr1, tblPatients.[PatientID]
FROM tblPatients
WHERE (((tblPatients.[PatientID]) Not In (Select PatientID from tblUniquePatients)));
```

6. Create a variable for "VFC-Eligible" in the "tblVFCEligibilityCatCodes" table
   a. Click underneath the record for 5-Uninsured to create a new record
   b. Enter 6 for Sort Order, 6 for VFCEligibilityCatID, and "VFC-Eligible" under VFCEligibilityCatName. (see Figure 10)

Figure 10



7. Update patient eligibility codes in the "tblPatientsPatientStatuses" to VFC-Eligible for all relevant categories.
   a. Find all values in the "VFCEligibilityCatID" field that are "1", "2", or "5" and replace with "6". This will put all VFC-Eligible categories into one category.
   b. Be sure to save the database after making these changes, then close it.

8. Open CoCASA and begin running a "Diagnostic Report Childhood" (see Figure 11) for each county, for each VFC eligibility category to be assessed.
   a. Select the assessment to run the report for; these should be named for the county the data came from. Click on the "Reports" tab. Select "Diagnostic Report Childhood", then enter the report criteria.
      i. Age Range: 19-35 Months as of 03/31/2019
      ii. Antigens-Series: 4:3:1:3:3:1:4
      iii. Compliance: by date: 03/31/2019

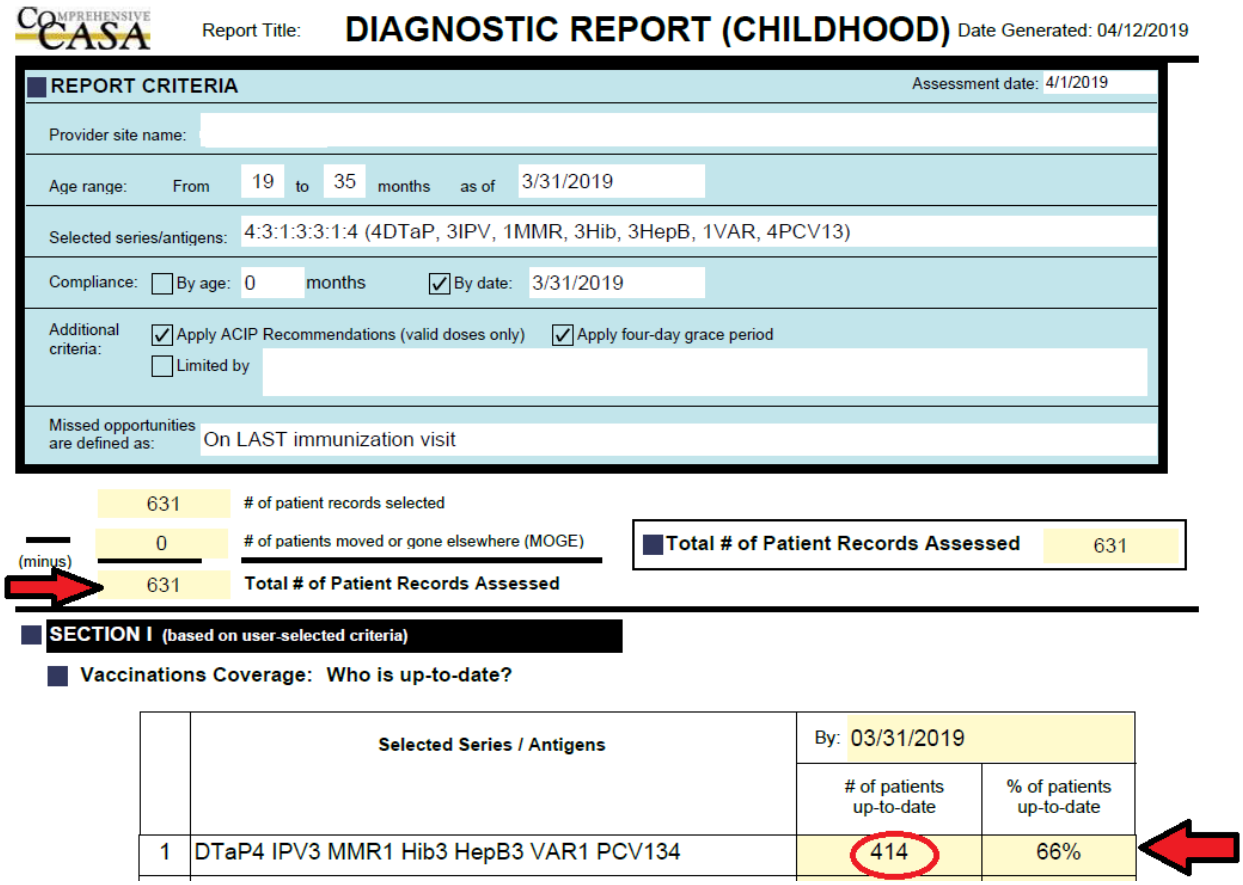
iv. Limit by a user-selected variable: after checking this box, click the button to open up the choices of variables. Choose the VFC Eligibility category you are running the report for.
v. Click "Run Report". When report is complete, click on "Export" and save the report.

b. In most cases, you will run 4 different reports for each county. One without choosing the user selected variable (to capture all children), one with "VFC-Eligible" as a choice, one with "Not VFC-Eligible", and one with "Underinsured".

9. Use the data provided on the county reports to manually populate a spreadsheet of values for each county (shown in Figure 11). Key fields to include are:
   a. Number of children included in the assessment
   b. Number of children who were up to date
   c. Percentage of children who are up to date

10. These fields should be populated for each eligibility category assessed.

Figure 11



References

Centers for Disease Control and Prevention. National Immunization Survey, NIS. Estimated for Completion of 4:3:1:3:3:1:4, complete for Hib series. Retrieved January 29, 2019 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6181261/

Centers for Disease Control and Prevention (CDC). (2015) Epidemiology and Prevention of Vaccine-Preventable Diseases. 13th ed. May 2015.

Centers for Disease Control and Prevention (CDC) Comprehensive Clinic Assessment Software Application (CoCASA), Version 14.1

Indiana Immunization Registry, CHIRP. Data obtained April 1, 2019.