National Immunization Survey

A User's Guide for the 2013 Public-Use Data File

Centers for Disease Control and Prevention

National Center for Immunization and Respiratory Diseases

and

National Center for Health Statistics

Presented by:

NORC at the University of Chicago

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Convention for Bolding Text

The Data User's Guide uses **bold** font to highlight substantive changes in the methodology or study design from last year's Guide.

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1. Introduction

In 1992 the Childhood Immunization Initiative (CII) (CDC 1994) was established to 1) improve the delivery of vaccines to children; 2) reduce the cost of vaccines for parents; 3) enhance awareness, partnerships, and community participation; 4) improve vaccinations and their use; and 5) monitor vaccination coverage and occurrences of disease. Subsequently, the Healthy People 2020 objectives established the targets of having at least 90 percent of 2-year-old children fully vaccinated with most recommended vaccines (targets are 85% for HepA and 80% for rotavirus) and 80 percent of 2-year-old children vaccinated with the basic immunization series. To fulfill the CII mandate of monitoring vaccination coverage and marking progress toward achieving those objectives, the National Immunization Survey (NIS) has been implemented by the National Center for Immunization and Respiratory Diseases (NCIRD) and the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC).

The target population for the NIS is children aged 19 to 35 months living in households in the United States at the time of the interview. The official coverage estimates reported from the NIS are rates of being up-to-date with respect to the recommended numbers of doses of all recommended vaccines (CDC 2014). These vaccines and their recommended numbers of doses are:

- diphtheria and tetanus toxoids and acellular pertussis vaccine, diphtheria and tetanus toxoids and pertussis vaccine, or diphtheria and tetanus toxoids vaccine (DTaP/DTP/DT) – 4 doses;
- poliovirus vaccine (polio) – 3 doses;
- measles/mumps/rubella vaccine (MMR) – 1 dose;
- *Haemophilus influenzae* type b vaccine (Hib) – 3 or 4 doses depending on product type;
- hepatitis B vaccine (Hep B) – 3 doses;
- varicella zoster (chicken pox) vaccine (varicella), – 1 dose;

- pneumococcal vaccine (PCV) – 4 doses; (Infants and children who have received ≥1 dose of PCV7 should complete the immunization series with PCV13. A single supplemental dose of PCV13 is recommended for all children aged 14--59 months who have received 4 doses of PCV7 or another age-appropriate, complete PCV7 schedule.)
- hepatitis A vaccine (Hep A) – 2 doses;
- influenza vaccine (For the recommended number of doses of influenza vaccine and other vaccines, see **http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/index.html**).
- rotavirus vaccine (RV) – 2 or 3 doses depending on product type

In addition to these vaccines, interest focuses on the vaccine series 4:3:1:3*:3:1:4 (4+ DTaP/DTP/DT, 3+ polio, 1+ MCV, 3 or 4 doses of Hib, depending on type of vaccine received, 3+ Hep B, 1+ varicella at or after 12 months of age, and 4+ PCV).

The NIS collects data on each of these vaccines. Varicella vaccine was added in Quarter 3, 1996, pneumococcal vaccine in Quarter 4, 2000, influenza vaccine and hepatitis A vaccine in Quarter 1, 2003, and rotavirus vaccine in Quarter 3, 2007. The remainder of the vaccines have been included in the NIS from its start in 1994. In October 2000, the Advisory Committee on Immunization Practices recommended that all children ages 2 to 23 months receive 4 doses of pneumococcal vaccine (CDC 2000). Influenza vaccine was recommended for children aged 6 to 23 months starting with the 2004-05 season (CDC 2003). Estimates of influenza vaccination coverage for the 2012-13 season can be obtained from the 2013 NIS.

The NIS uses random digit dialing (RDD) telephone survey methodology to identify households containing children in the target age range and interviews the adult who is most knowledgeable about the child's vaccinations. With consent of the child's parent or guardian, the NIS also contacts (by mail) the child's health care provider(s) to request information on vaccinations from the child's medical records.

Samples of telephone numbers are drawn independently, for each calendar quarter, within selected geographical areas, or strata. **In 2013, there were 59 geographic strata for which vaccination coverage levels can be estimated, including 7 primarily urban city/county areas (including the District of Columbia); the remaining 52 estimation areas are either entire states or territories (including U.S. Virgin Islands and Guam) or "rest of state" areas. This design makes it possible to produce annual estimates of vaccination coverage levels for each state or territory (including U.S. Virgin Islands and Guam) and for each of the 7 sub-state estimation areas with a specified degree of precision (a coefficient of variation of approximately 7.5 percent).** Further, by using the same data collection methodology and survey instruments in all estimation areas, the NIS produces comparable vaccination coverage levels among estimation areas and over time.

When the NIS was established in 1994, 78 areas were chosen for sampling strata, including the 50 states, 6 urban areas that receive federal Section 317 immunization grants (Bexar County, TX; Chicago, IL; District of Columbia; Houston, TX; New York City; Philadelphia County, PA), and 22 other urban areas. These areas were called "Immunization Action Plan" (IAP) areas in reference to plans developed to improve immunization coverage following the resurgence of measles during 1989-1991. In 2005 and 2006, selected non-grantee IAP areas were "rotated off" (i.e., not oversampled), and replaced by new areas "rotated on" (i.e., oversampled). Starting in 2007, the base NIS geographic strata included 56 areas (6 grantee urban areas and 50 state or "rest of state" areas). In addition, starting in 2007, state immunization programs could choose city/county areas of interest to be oversampled, using their grant funds. **In 2013, the additional area chosen was El Paso County, TX.** As in 2012, NIS data were collected in the U.S. Virgin Islands in 2013, **and in 2013 data were also collected in Guam;** as noted throughout this report, several of the sampling, data collection, and estimation procedures differed for the U.S. Virgin Islands and Guam when compared to the rest of the U.S., including the creation of separate survey weight variables for analysis that is to include the U.S. Virgin Islands and Guam.

The 59 = 56 + 1 + 2 (U.S. Virgin Islands and Guam) areas are called *estimation areas*. Table 11 in Section 8 shows cross-walk of estimation areas between years.

To maintain consistency with past NIS public-use data files, variable names and descriptions continue to use the term "IAP" to designate areas included as strata, which was the term used prior to 2008. The changing geographic strata over time will not cause a problem with bias in estimation of state and national coverage levels since the geographic strata are nested within state.

In 2013, the NIS utilized a dual-frame sampling design with independent samples drawn from landline and cell-phone sampling frames. The cell-phone component was added to the survey in 2011 in order to address the rapid rise of cell-phone-only households. Preliminary results from the July-December 2013 National Health Interview Survey (NHIS) indicate that the number of households with only cell phones continues to increase. Approximately 47.1 percent of all children under 18 years of age—approximately 35 million children—live in households with access to only wireless telephones (Blumberg and Luke 2014). Several of the sampling, data collection and estimation procedures differ for the cell-phone sample as compared to the landline sample, as noted throughout this report.

For the 2013 NIS landline and cell-phone samples, the household interviews began on January 10, 2013 and ended on February 7, 2014. Provider data collection extended from February 2013 to May 2014 for both sample sources. A total sample (including sample from the U.S. Virgin Islands and Guam) of approximately 8.2 million telephone numbers (3.5 million landline and 4.7 million cell-phone) yielded household interviews for 23,248 children (5,165 landline and 18,083 cell-phone), 14,060 of whom (3,270 landline and 10,790 cell-phone) had provider data adequate to determine whether the child was up-to-date with respect to the recommended immunization schedule. The 2013 NIS public-use data file contains data for the 23,248 children with completed household

interviews, and more extensive data for the 14,060 children with adequate provider data (including 156 zero-shot children).

The weights included in this public-use file (PUF) afford the data analyst the capability of conducting several different types of analyses, depending on interests and aims. One can choose to analyze all children with completed household interviews or only the subset of children for whom the provider-reported data are adequate. Also, one can choose to include or exclude children who reside in the U.S. Virgin Islands and Guam in the analysis. Previous NIS public-use data files have also provided analysts with these capabilities.

The 2013 Public-Use File includes only dual-frame weights. Dual-frame estimates have been the best estimates for past dual-frame NIS in terms of minimizing any bias due to the incompleteness of the landline sampling frame. Section 6 of this user's guide provides information about the creation of the weight variables included in the 2013 NIS public-use data file, and Section 8 provides guidance for their use.

Published tables of vaccination coverage estimates for 2013 will be available on the National Center for Immunization and Respiratory Diseases website, http://www.cdc.gov/vaccines/imz-managers/coverage/imz-coverage.html.

An article summarizing key findings from the NIS data, as published in the *Morbidity and Mortality Weekly Report (MMWR),* will be available on the Centers for Disease Control and Prevention website at http://www.cdc.gov/vaccines/imz-managers/coverage/nis/child/index.html . The accompanying codebook (NCHS 2014) documents the contents of the 2013 NIS public-use data file. For reference, Appendix E (Alphabetical Listing of Variables in the 2004-2013 Public-Use Data Files) provides a full list of variables in the 2013 public-use data file.

Additional information on the NIS is available at:

http://www.cdc.gov/nchs/nis.htm

For additional information on the NIS public-use data file, please contact the NCHS Information

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2. Sample Design

The NIS uses two phases of data collection to obtain vaccination information for a large national probability sample of young children: an RDD telephone survey designed to identify households with children 19 to 35 months of age, followed by the Provider Record Check Study, a mailed survey to children's immunization providers. This section summarizes these two phases of data collection. Other descriptions of the sample design are given by Ezzati-Rice et al. (1995), Zell et al. (2000), and Smith et al. (2001a, 2005).

2.1. The NIS RDD Telephone Survey

The NIS RDD telephone survey phase uses independent, quarterly samples of telephone numbers. **Landline and cell-phone telephone numbers were sampled within estimation areas in each quarter of 2013.** Table F.1 (in Appendix F) lists the 59 estimation areas for the 2013 NIS by state and shows the estimated number of children living in each state and estimation area in 2013.

The NIS uses the list-assisted method of RDD (Lepkowski 1988) to sample landline telephone numbers. This method selects a random sample of telephone numbers from "banks" of 100 consecutive telephone numbers (e.g., 773-256-0000 to 773-256-0099) that contain at least one directory-listed residential telephone number. Because directory listings are not available for cell phones, the NIS cell-phone sample did not use the list-assisted method of RDD, but rather used RDD without list-assistance. That is, the cell-phone sample was selected from all banks of cell-phone numbers, not just those containing at least one directory-listed residential telephone number. Directory listings were also unavailable for the U.S. Virgin Islands and Guam landline sample frame, so the sample lines for the U.S. Virgin Islands and Guam were likewise selected without list-assistance even though they were landline telephone numbers.

The target sample size of completed telephone interviews in each estimation area is designed to achieve an approximately equal coefficient of variation of 7.5 percent for an estimator of immunization coverage

derived from provider-reported immunization histories, given a true coverage parameter of 50 percent. Landline telephone and cell-phone sample sizes were chosen such that the two samples combined meet the target coefficient of variation of 7.5 percent.

In 2013, 60.5 percent of children (63.3 percent of landline sample children and 59.7 percent of cell-phone sample children) with a completed household interview were determined to have adequate provider data. The phrase "adequate provider data" means that sufficient vaccination history information was obtained from the provider(s) to determine whether the child is up-to-date with respect to the recommended vaccination schedule. **The percentage of children with adequate provider data varies among estimation areas (from 50.4 percent in the City of New York to 70.0 percent in Oregon).** Starting with the 2002 public-use data file, the definition of children with adequate provider data was expanded to include unvaccinated children. These are children for whom the respondent reported, during the household interview, that the child had received no vaccinations and either has no immunization providers or has one or more immunization providers, but those providers all reported administering no vaccinations. An NCHS Series 2 Report on the statistical methodology of the NIS (Smith et al. 2005) includes details of how unvaccinated children are included in the estimates of vaccine coverage. This report can be viewed at http://www.cdc.gov/nchs/data/series/sr_02/sr02_138.pdf. This modification to the NIS produces only small changes in vaccination coverage for estimation areas and states, because the number of unvaccinated children in the sample is very small (only 156 in 2013). Due to questionnaire changes, beginning with the 2012 non-public Child Level Analysis File (CLAF), the definition of "adequate provider data" has changed slightly. Now, all children with at least one provider-reported vaccination are considered to have adequate provider data.

The design and implementation of the NIS landline sample involves four procedures. First, statistical models predict the number of sample telephone numbers needed in each estimation area to meet the target precision requirements. Second, the sample for an estimation area is divided into random sub-samples called replicates. By releasing replicates as needed, it is possible to spread the interviews for each

sampling area evenly across the entire calendar quarter. Third, an automated procedure eliminates a portion of the non-working and non-residential telephone numbers from the sample before the interviewers dial them. Fourth, the sample telephone numbers are matched against a national database of residential telephone numbers in order to obtain usable mailing addresses for as many sample households as possible. To promote participation in the NIS, an advance letter is sent to these addresses approximately two weeks prior to the household interview. (For U.S. Virgin Islands and Guam samples, mailing addresses were not obtained, and advance letters were not sent.)

The design and implementation of the cell-phone sample differs from that of the landline sample in two ways:

- There is not an effective procedure to eliminate a portion of non-working and non-residential cell-phone numbers. Almost all cell-phone sample lines were sent to the interviewers for dialing.
- Cell-phone numbers were not matched to an external database to obtain mailing addresses. Cell-phone sample cases were not sent advance letters.

2.2. The NIS Provider Record Check

At the end of the household interview, consent to contact the child's vaccination provider(s) is requested from the parent/guardian. When oral consent is obtained, each provider is mailed an immunization history questionnaire. This mail survey portion of the NIS is the Provider Record Check (PRC). The Provider Record Check is conducted in the same manner for both landline and cell-phone sample cases.

The instructions ask vaccination providers to mail or fax the immunization history questionnaire back upon completion. Two weeks after the initial mailing, a telephone call is made to providers who have still not responded, to remind and encourage them to complete the form and either mail or fax the information back. In some instances, provider-reported vaccination histories are completed over the telephone. The

data from the questionnaires are edited, entered, cleaned, and merged with the household information from the RDD survey to produce a child level record.

2.3. Summary of Data Collection

Table 1 presents selected operational results of NIS data collection for calendar year 2013 for the entire sample, excluding the sample from the U.S. Virgin Islands and Guam. To facilitate comparisons with prior years, the numbers in Table 1 are presented separately for the landline and cell-phone samples. Children ages 19 to 35 months during 2013 data collection were born between January 2010 and May 2012.

The landline RDD sample (in replicates that were released for use) consisted of 3,395,198 telephone numbers. Of those, 2,017,511 were eliminated before release to the telephone centers by the automated procedure as non-working, non-residential, cellular telephone, or "take me off the list" numbers. The remaining 1,377,687 numbers were sent to the telephone centers to be dialed, and 363,646 households were identified, as shown in Rows C and F. Among the identified households, 330,986 (91.0 percent) were successfully screened. Of these, 325,162 did not contain an age-eligible child, and 5,824 (1.8 percent) contained one or more age-eligible children. Among these households, 4,792 (82.3 percent) completed the household interview.

The cell-phone sample (in replicates that were released for use) consisted of 4,537,972 telephone numbers. Of those, 25 were eliminated before release to the telephone centers by the automated procedure as non-working, non-residential, cell telephone, or "take me off the list" numbers. The remaining 4,537,947 numbers were sent to the telephone centers to be dialed, and 900,123 active personal cell-phone numbers (APCNs) were identified, as shown in Row F. Among the identified APCNs, 713,754 (79.3 percent) were successfully screened. Of these, 23,781 (3.3 percent) were deemed eligible for the NIS survey. Among the identified eligible respondents, 17,027 (71.6 percent) completed the interview.

A standard approach for measuring response rates in telephone surveys has been defined by the Council of American Survey Research Organizations (CASRO 1982). The CASRO response rate is equivalent to "RR3" of AAPOR Standard Definitions (AAPOR 2011). **In 2013, the CASRO response rate (Row J, Table 1) for the landline sample was 62.3 percent. The CASRO response rate equals the product of the resolution rate (83.2 percent, Row E), the screening completion rate (91.0 percent, Row G), and the interview completion rate among eligible households (82.3 percent, Row I).** The resolution rate is the percentage of the total telephone numbers selected that are classifiable as non-working, non-residential, or residential. The screening completion rate is the percentage of known households that are successfully screened for the presence of age-eligible children. The interview completion rate is the percentage of households with one or more age-eligible children who complete the household interview.

The CASRO response rate (Row J) for the cell-phone sample in 2013 was 30.5 percent. As with the landline sample, it equals the product of the resolution rate (53.8 percent, Row E), the screening completion rate (79.3 percent, Row G), and the interview completion rate among eligible households (71.6 percent, Row I).

Row K of Table 1 shows that household interviews were completed on behalf of 4,963 age-eligible children in the landline sample and 17,499 children in the cell-phone sample. Rows L through O give results for the Provider Record Check phase. Specifically, Row L gives the rate of obtaining oral consent from household respondents to contact their children's vaccination providers – 69.6 percent for landline sample cases and 67.1 percent for cell-phone sample cases in 2013. The number of immunization history questionnaires mailed to vaccination providers exceeds the number of completed interviews for children with consent, because some children have more than one vaccination provider.

Of the questionnaires mailed to providers of children from the landline sample, 4,105 (96.8 percent, Row N) were returned. Among the children with completed household interviews, 3,152 (63.5 percent, Row O) had adequate vaccination histories based on provider reporting (3,127) or were

determined to be unvaccinated (25). The other 36.5 percent of children lacked adequate provider data for a variety of reasons, such as the parent did not give consent to contact the child's provider(s), or the provider(s) did not have medical records for the child.

Of the questionnaires mailed to providers of children from the cell-phone sample, 14,491 (96.0 percent, Row N) were returned. Among the cell-phone-sample children with completed household interviews, 10,459 (59.8 percent, Row O) had adequate vaccination histories based on provider reporting (10,333) or had no vaccinations based on household reporting (126). The other 40.2 percent of children lacked adequate provider data for a variety of reasons, such as the parent did not give consent to contact the child's provider(s), or the provider(s) did not have medical records for the child.

In 2013, data from the Health Insurance Module (HIM) were collected. Among the 4,963 age-eligible children in the landline sample with completed household interviews, 3,546 (71.5 percent, Row P) completed the HIM. Among the 17,499 age-eligible children in the cell-phone sample with completed household interviews, 11,833 (67.6 percent, Row P) completed the HIM.

For each estimation area and each state, Table F.1 (see Appendix F) shows the number of children with completed household interviews and the number of children with adequate provider data.

Table 1: Selected Operational Results of Q1/2013-Q4/2013 NIS Data Collection (Excluding U.S. Virgin Islands and Guam)

Row	Key Indicator	Landline Sample (Q1/2013-Q4/2013) Number	Landline Sample (Q1/2013-Q4/2013) Percent	Cell-Phone Sample (Q1/2013-Q4/2013) Number	Cell-Phone Sample (Q1/2013-Q4/2013) Percent	Formula
	Household Phase					
A	Total Selected Telephone Numbers in Released Replicates	3,395,198	--	4,537,972	--	--
B	Phone Numbers Resolved before Computer-Assisted Telephone Interviewing	2,017,511	59.42%	25	0.0005%	B/A
C	Total Phone Numbers Released to Telephone Centers	1,377,687	--	4,537,947	--	
D	Advance Letters Mailed	577,759	41.94%	10,967	0.24%	D/C
E	Resolved Phone Numbers[1] – *Resolution Rate*	2,825,547	83.22%	2,439,654	53.76%	E/A
F	Households Identified – *WRN/APCN Rate*[2]	363,646	12.87%	900,123	36.90%	F/E
G	Households Successfully Screened[3] –*Screener Completion Rate*	330,986	91.02%	713,754	79.30%	G/F
H	Eligible Households – *Eligibility Rate*[4]	5,824	1.76%	23,781	3.33%	H/G
I	Households with Completed Household Interviews – *Interview Completion Rate*	4,792	82.28%	17,027	71.60%	I/H
J	CASRO Response Rate[5]	--	62.33%	--	30.52%	E*G*I
K	Age-Eligible Children with Completed Household Interviews[6]	4,963	--	17,499	--	--
	Provider Phase					
L	Children with Consent to Contact Vaccination Providers	3,453	69.57%	11,744	67.11%	L/K

Row	Key Indicator	Landline Sample (Q1/2013-Q4/2013) Number	Landline Sample (Q1/2013-Q4/2013) Percent	Cell-Phone Sample (Q1/2013-Q4/2013) Number	Cell-Phone Sample (Q1/2013-Q4/2013) Percent	Formula
M	Immunization History Questionnaires Mailed to Providers	4,240	--	15,097	--	--
N	Immunization History Questionnaires Returned from Providers	4,105	96.82%	14,491	95.99%	N/M
O	Children with Adequate Provider Data	3,152 (includes 25 unvaccinated children)	63.51%	10,459 (includes 126 unvaccinated children)	59.77%	O/K
	Modules					
P	Age-Eligible Children with Completed Household Interview and Completed Health Insurance Module – *HIM Completion Rate*	3,546	71.45%	11,833	67.62%	P/K

[1] For landline sample, includes phone numbers resolved before CATI (Row B).
[2] For the landline sample, this is the working residential number (WRN) rate; for the cell-phone sample, it is the active personal cell-phone number (APCN) rate.
[3] For the landline sample, this is the age-eligibility screener; for the cell-phone sample, it is a combination of the screener for non-minor-only cell-phone status and the age-eligibility screener.
[4] For the landline sample, this is the age-eligibility rate; for the cell-phone sample, it reflects the non-minor-only cell-phone rate and the age-eligibility rate.
[5] CASRO, Council of American Survey Research Organizations.
[6] Rows K-P reflect the removal of children with an ineligible best date of birth.

2.4. Informed Consent, Security, and Confidentiality of Information

The advance letter, introduction to the telephone survey, and oral consent assure the respondent of the confidentiality of his/her responses and the voluntary nature of the survey. Informed consent is obtained from the person in the household most knowledgeable about the eligible child's immunization history (generally the parent or guardian of the child). Informed consent to contact the child's vaccination provider(s) is obtained at the end of the interview.

Information in the NIS is collected and processed under high security. To ensure privacy of the respondents and confidentiality of sensitive information, NCHS has established standards for release of

data from all NCHS surveys. All CDC staff and contractor staff involved with the NIS sign the NCHS confidentiality agreement and follow instructions to prevent disclosure.

All information in the NIS is collected under strict confidentiality and can be used only for research [Section 308(d) of the Public Health Service Act, 42 U.S. Code 242m(d), the Privacy Act of 1974 (5 U.S. Code 552a), and the Confidential Information Protection and Statistical Efficiency Act (5 U.S. Code). Prior to public release, the contents of the public-use data file go through extensive review by the NCHS Disclosure Review Board to protect participant privacy as well as data confidentiality.

3. Content of NIS Questionnaires

This section describes the questionnaires used in the 2013 NIS telephone interview of households and in the NIS Provider Record Check.

3.1. Content of the Household Questionnaire

The computer-assisted telephone interview (CATI) questionnaire used in the RDD phase of NIS data collection consists of two parts: a screener to identify households with children ages 19 to 35 months and an interview portion. The questionnaire is modeled on the Immunization Supplement to the National Health Interview Survey (NHIS) (NCHS 1999). The NIS CATI questionnaire has been translated into Spanish, and Language Line Services (formerly part of AT&T) is used for real-time translation into many other languages (Wall et al. 1995). Table 2 summarizes the content of each section of the NIS household interview. The CATI questionnaire is available at http://www.cdc.gov/nchs/nis/data_files.htm.

In the screener, the purpose of the survey is explained to the respondent, and the household is screened to determine whether it contains any children ages 19 through 35 months (any child who would be ages 19-35 months during the calendar quarter sampled are eligible). If the household has an eligible child, the respondent is asked whether he/she is the most knowledgeable person for the child's vaccination history. If the respondent indicates that another person in the household is more knowledgeable, the interviewer asks to speak to him/her at that time. If that person is unavailable to be interviewed, the interview proceeds to Section MR, the name of the most knowledgeable person is recorded, and a "callback" is scheduled for a later date. For cell-phone sample, prior to screening for age-eligibility the household was screened to ensure that the cell-phone was used by an adult (i.e., to ensure it was not a minor-only cell phone). If the household has more than one age-eligible child, data are collected for each eligible child.

Table 2: Content of the Household Interview, National Immunization Survey, 2013

Questionnaire Section	Content of Section
Section S	Screening questions to determine eligibility, roster of eligible children, availability of shot records
Section MR	Most-knowledgeable-respondent callback questions
Section B	Vaccination history
Section C	Demographic and socioeconomic questions
Section D	Provider information and request for consent to contact the eligible child's vaccination provider(s)
Section E	Health Insurance Module

In Q1/2012, updates were made to the household reported shot questions in the NIS. Section A of the NIS was no longer asked; all respondents were administered Section B, regardless of whether the most knowledgeable respondent had access to the child's vaccination records.

Prior to Q1/2012, the person being interviewed was asked during the screener section whether he/she had a written record (shot card) of the child's vaccination history, and whether it was easily accessible. If a shot card was available, the respondent was asked to provide information directly from it in Section A. However, beginning in Q1/2012, Section A and most of Section B were eliminated from the questionnaire, and therefore all interviews proceed directly to a reduced form of Section B, which asks the respondent to recall information about the child's influenza vaccinations.

Section C obtains information that includes relationship of respondent to the child, race of the child, household income, educational attainment of the mother, and other information on the socioeconomic characteristics of the household and its eligible children. This section is asked of all respondents upon completion of Section B.

In Section D of the NIS household interview, identifying information (such as name, address, and telephone number) for the child's vaccination provider(s) is requested, as well as the full names of the child(ren) and the respondent, so that NIS personnel can contact the provider(s) and identify the child(ren) whose immunization information the NIS is requesting. After this information is obtained, consent to contact the child's vaccination provider(s) is requested. When oral consent and sufficient identifying information are obtained, the immunization history questionnaire is mailed to the child's vaccination provider(s).

Beginning in 2006, a Health Insurance Module (HIM) was administered upon completion of Section D to collect data regarding the types of medical insurance coverage the child has had since birth. If a respondent provided consent to contact medical providers and completed Section D, he/she flowed directly into the HIM. If, however, consent or any other critical provider question was refused, the call was terminated; only upon callback on which consent was granted or a second refusal given within Section D was the respondent asked the HIM. See Section 7.10 of this user's guide for information on the HIM variables included on the public-use data file.

Some changes were made to the NIS questionnaire during 2013. These are listed below.

- **In Q1/2013, a question in Section B of the household questionnaire was changed to capture additional data for households who did not know or refused any of the flu dates in the previous questions. Skip logic at BLOCATION was changed so that if the respondent enters 77/7777 or 99/9999 at B8DM_x or B9DM_x he/she will be asked BNEXTFLU before continuing to B10_x.**
- **Year references for income questions were updated to refer to the previous year, 2012. The question text at CFAMINC, C12_DON'T_KNOW, and C12_REFUSED was updated to ask about 2012 income rather than 2011.**

- **Data was collected in Guam in 2013 (landline and cell-phone sample). References to the "Department of Public Health and Social Services" were added to the introductory and exit scripts, and the shot card section (Section A) was asked of Guam respondents if they had a shot card available. Demographic questions for Guam were also altered to ask more specifically about village of residence and race categories. Guam-specific response options were also added to the location of flu shot question (BLOCATION) and some of the Health Insurance Module questions.**
- **On July 1, 2013, changes were made to the flu vaccination questions in Section B to reflect the new flu season.**
    - **B8_X, B8DMA_X, B8DM_X, and B9DM_X were changed to reference 2013 instead of 2012 in the question text.**
    - **BNEXTFLU was updated to reference the end of the flu season as 2014 instead of 2013 in the question text.**
- **In Q2/2013, an experiment was conducted wherein a portion of the cell-phone sample was mailed advance letters. A subset of the cell-phone sample was flagged to be asked S3_LTR, which asked if they had received the letter. In previous quarters this question was only asked of landline sample cases.**
- **In Q3/2013 the year reference for all flu questions was updated to accurately account for the change in flu season starting October 1, 2013.**
- **In Q3/2013, certain landline sample replicates were chosen to be part of a web experiment. Within these replicates, a set of cases with mailing addresses available was asked in the advance letter to complete the survey via the web, while another set with addresses available served as a control group and did not receive the web offer.**

3.2. Content of the Immunization History Questionnaire (IHQ)

The immunization history questionnaire administered to the vaccination providers is designed to be simple and brief, to minimize provider burden and encourage survey participation. The structure and content of this form were initially derived from the National Immunization Provider Record Check Study (NHIS/NIPRCS), which collected and reconciled immunization data from the providers of respondents to the Immunization Supplement to the National Health Interview Survey. The immunization history questionnaire consists of two double-sided pages. Page 1 includes space for a label that gives the child's name, date of birth, and gender. The remainder of page 1 contains questions about the facility and vaccination provider. Page 2 gives instructions for filling out the shot grid, which appears on page 3. Page 4 thanks the vaccination provider for providing the information, and lists websites and telephone numbers that can be used to obtain more information about the NIS and the National Center for Immunization and Respiratory Diseases. The Immunization History Questionnaire is available at http://www.cdc.gov/nchs/nis/data_files.htm.

Some changes were made to the NIS IHQ during 2013. These are listed below.

- **Previous versions of the IHQ requested vaccination information pertaining to the 2009 H1N1 vaccine. In Q3/2013, the 2009 H1N1 vaccine was removed from the IHQ vaccination grid. As a result of this change, all counters and up-to-date variables relating to provider-reported H1N1 vaccinations have been removed from the PUF.**
- **In Q3/2013, 'Hib-MenCY' was added to the list of Hib vaccination types that providers can choose from. However, because this vaccine subtype box was not available for the entire year, shots of this type of been coded as Hib shots of unknown type (type 'HI') on the PUF.**

4. Data Preparation and Processing Procedures

The household data collection and provider data collection in the NIS incorporate extensive data preparation and processing procedures. During the household interview, the CATI system supports reconciliation of critical errors as interviewers enter the data. After completion of interviewing for a quarter, post-CATI editing and data cleaning produce a final interview data file. The editing of the provider data begins with a manual review of returned immunization history questionnaires, data entry of the questionnaires, and cleaning of the provider data file. After the provider data are merged with the household interview data and responses from multiple providers for a child are consolidated into a child level data record, the editing continues. A quality assurance check is performed, from all sources of the date-of-birth information, to ensure that the provider completed the questionnaire for the correct child and to confirm age-eligibility. Editing of the provider-reported vaccination dates then attempts to resolve specific types of discrepancies in the provider data. The end product is an analytic file containing household and provider data for use in estimating vaccination coverage.

4.1. Data Preparation

The editing and cleaning of NIS data involves several steps. First, the CATI system enables interviewers to reconcile potential errors while the respondent is on the telephone. Further cleaning and editing take place in a post-CATI clean-up stage, involving an extensive review of data values, cross tabulations, and the recoding of verbatim responses for race, ethnicity, and vaccinations. The next step involves the creation of numerous composite variables. Provider data are cleaned in a separate step. After these steps have been completed, imputations are performed for item non-response on selected variables, and weights are calculated. The procedures and rules of the National Health Interview Survey serve as the standard in all stages of data editing and cleaning (http://www.cdc.gov/nchs/nhis.htm).

4.1.1. Editing in the CATI System

The CATI software checks consistency across data elements and does not allow interviewers to enter invalid values. Catching potential errors early increases the efficiency of post-survey data cleaning and processing.

To prevent an overly complicated CATI system, out-of-range and inconsistent responses produce a warning screen, allowing the interviewer to correct real time errors. This allows the interviewer to reconcile errors while respondent is on the telephone. CATI warning screens focus on items critical to the survey, such as those that determine a child's eligibility (e.g., date of birth).

A CATI system cannot simultaneously incorporate every possible type of error check and maximize system performance. To reconcile this trade-off, post-CATI edits are used to resolve problems that do not require access to the respondent, as well as unanticipated logic problems that appear in the data.

4.1.2. Post-CATI Edits

The post-CATI editing process produces final, cleaned data files for each quarter. The steps in this process, implemented after all data collection activities for a quarter are completed, are described below.

Initial Post-CATI Edits and File Creation

After completion of interviewing each quarter, the raw data are extracted from the CATI data system and used to create two files: the sample file and the interview data file. The sample file contains one record for each sample telephone number and summary information for telephone numbers and households. The interview data file contains one record for each eligible sample child and all vaccination data reported for the child during the household survey.

Following creation of these two files, a preliminary analysis of each file identifies out-of-range values and extraneous codes. The first check verifies the eligibility status of children, based on date of birth and date

of interview. Once the required corrections are verified, invalid values are replaced with either an appropriate data value or a missing value code.

Frequency Review

After the pre-programmed edits are run, frequency distributions of all variables in each file are produced and reviewed. Each variable's range of values is examined for any invalid values or unusual distributions. If blank values exist for a variable, they are checked to see whether they are allowable and whether they occur in excessive numbers. Any problems are investigated and corrected as appropriate.

File Crosschecks

Crosscheck programs ensure that cases exist across files in a consistent manner. Specifically, checks ensure that each case in the interview data file is also present in the sample file and that each case in the sample file was released to the telephone center. Checks also ensure that no duplicate households exist in the sample file and no duplicate children exist in the interview data file.

When all checks have been performed, the final quarterly interview data file is created. Programmers and statisticians then create composite variables constructed from basic variables for each child. Sampling weights (described in Section 6 of this Guide) are added to each record.

4.1.3. Editing of Provider Data

Six to eight weeks after the close of household data collection for a quarter, the majority of the immunization history questionnaires have been collected from providers. The data from the hard-copy questionnaires are entered and independently re-entered to provide 100 percent verification. The provider data file is cleaned, in a similar fashion to the household data file, for out-of-range values and consistency. A computer program back-codes all “other shot” verbatim responses into the proper vaccine category (e.g., Engerix B counts as Hep B, and Tetramune counts as DTP and Hib). These translations come from a file that contains all such verbatim responses ever encountered in the NIS. Also, the provider

data file is checked for duplicate records, and exact duplicates are removed. If the provider data contain a date of birth of the child, gender of the child, or child name that differs from the household interview for that child, the questionnaire is re-examined to see whether it may have been filled out for the incorrect child. Provider data that appear to have been filled out for the wrong child are removed from the provider database. When a child has data from multiple providers, decision rules are applied to produce the most complete picture of the child's immunization history.

Once these data have been cleaned, they are combined with the household data file. Information from up to five providers can be added to a child's record. If more than one provider reported vaccination data for the child, the data from the multiple provider reports are combined into a single history for the child, called the "synthesized provider-reported vaccination history". The determination of whether the child is up-to-date for recommended vaccines and vaccine series is based on the child's synthesized provider-reported vaccination history.

Many variables in the household data file are checked against or verified with the provider data file. For example, a child's date of birth as recorded by the **provider** is checked against the date of birth as given by the household, to verify that the provider was reporting for that specific child and to form a "best" date of birth for the child. Vaccination dates are also compared, and any discrepancies are examined by hand. In most instances, the provider data are used in preference to the household data. All children with at least one provider-reported vaccination are considered to have adequate provider data.

4.2. Limitations of Data Editing Procedures

Although data editing procedures were used for the NIS, the data user should be aware that some inconsistent data might remain in the public-use data file. The variables that indicate whether a child is up-to-date on each vaccine or series (on which the estimates of vaccination coverage are based) are derived from provider-reported data. Hence, the household-reported vaccination dates (from interviews

conducted with a shot card) are not edited for discrepancies beyond the built-in checks in the CATI system.

The NIS does not re-contact households or providers to attempt to reconcile potential discrepancies in provider-reported vaccination dates or to resolve date-of-birth reporting errors. However, beginning with the 1999 NIS, the provider-reported data are manually reviewed and edited to correct specific reporting errors. The *National Immunization Survey: Guide to Quality Control Procedures* (CDC 2002) discusses the change in editing procedures in more detail. Some children with adequate provider data may have incomplete vaccination histories. These incomplete histories arise from three primary sources: 1) the household does not identify all vaccination providers, 2) some but not all providers respond with vaccination data, and 3) all identified providers respond with vaccination data but fail to list all the vaccinations in the child's medical record. Even with these limitations, the NIS overall is a rich source of data for assessment of up-to-date status and age-appropriate immunization. Also, NIS is the only source to provide comparable vaccination data across states and local areas in the US.

4.3. Variable-Naming Conventions

The names of variables follow a systematic pattern as much as possible. The codebook for the public-use data file groups the variables into ten broad categories according to the source of the data (household or provider) and the content of the variable (NCHS 2014). See Section 7 of this report for detailed information on the contents of the public-use data file.

4.4. Missing Value Codes

Missing value codes for each variable can be found in the codebook (NCHS 2013). For household variables, the missing value codes usually are 77 for DON'T KNOW and 99 for REFUSED. Some household variables may also contain blanks, if the question was not asked. The variables developed from the immunization history questionnaire generally do not have specific missing value codes.

4.5. Imputation for Item Non-Response

The NIS uses imputation primarily to replace missing values in the socioeconomic and demographic variables used in weighting. Missing values of these variables are imputed for all children with a completed household interview – i.e., all children appearing on the public-use data file. A sequential hot-deck method is used to assign imputed values (Ford 1983). Class variables are used to separate respondents into cells. Donors and recipients must agree on the categories of the class variables, which include estimation area. Within the categories of the class variables, respondents are sorted by variables related to the variable to be imputed. The last case with an observed value is used as the donor for up to four recipients. The "Notes" line for each variable in the codebook (NCHS 2014) identifies variables that contain imputed values. These variables include the gender, Hispanic origin, race, and first-born status of the child, and the education level, age group, marital status, and mobility status of the mother.

The count of vaccinations for a specific vaccine is based on the number of unique vaccination *dates* reported by the child's provider(s). In filling out the immunization history questionnaire a provider may not know the date of the first dose of hepatitis B, which is typically given at birth. The provider does, however, have the option of checking the "Given at Birth" box for the first dose of hepatitis B. If it was checked "yes" and the date of the birth dose of hepatitis B was not reported, a program assigns the date of the birth dose for this vaccine. A value is imputed from the distribution of provider-reported dates for the birth dose of hepatitis B in the most recent four-quarter CLAF. The birth dose for this imputation is defined as being given in the first 7 days of life--between the date of birth (i.e., 0 days) and the date of birth plus 6 days. This imputation procedure was first implemented for Quarter 1, 2000 – Quarter 4, 2000. For Quarter 1, 2013 – Quarter 4, 2013 a total of 62 children had the date of the birth dose of hepatitis B assigned using the above procedure (see HEP_FLAG).

Table 3 shows the distribution of age in days at the birth dose of hepatitis B for children in Quarter 1, 2013 – Quarter 4, 2013 with a provider-reported birth dose. A similar table is included in the 2000-2012 data user's guides. For 1997, 1998, and 1999, Section 5 of the data user's guide provides information on

the distribution of age in days for the birth dose of hepatitis B vaccine and gives guidance on imputing age in days at birth dose for children with a missing date, but for whom the provider checked the box indicating that a dose was administered at birth (see HEP_BRTH).

Table 3: Distribution of Age (in Days) at the Birth Dose of Hepatitis B Vaccine, National Immunization Survey, 2013

Age in Days at Birth Dose	Unweighted Percentage Of Birth Doses[†]
0	57.5
1	26.1
2	10.6
3	2.7
4	1.3
5	.7
6+	1.2

[†] Excludes U.S. Virgin Islands and Guam.

4.6. Vaccine-Specific Recoding of Verbatim Responses

During the household interview, respondents are given the option to report vaccinations in addition to, or instead of, the categories specifically read to them. Similarly, on the IHQ providers can list vaccinations in the "other" section of the IHQ shot grid. These verbatim responses are entered into the CATI system by the interviewer and stored in the interview data file. After data collection, they are reclassified into the listed categories, if possible, using a vaccination recoding table. This table is reviewed by National Center for Immunization and Respiratory Diseases personnel to ensure the shots are recoded into the appropriate category or categories (for combination shots).

4.7. Composite Variables

A number of composite variables (constructed from basic variables) are created and included in the NIS public-use data file. Composite variables assist users and data analysts by eliminating duplication of effort and making NIS data easier to use.

Since the initial years of NIS data collection, the household composite variables have included up-to-date status on individual vaccinations, race of child, household income, and up-to-date status on several vaccination series. Many of these household composite variables are included in the NIS public-use data file. See Section 7 of this report for information on the key variables that are included.

In Quarter 3, 1999 the NIS race questions (see questions C3, C9 and C10 in the household questionnaire) were expanded to include Alaska Native, Native Hawaiian, and Pacific Islander, implementing the revised Office of Management and Budget (OMB) standards for classification of race and ethnicity (http://www.whitehouse.gov/omb/fedreg_1997standards). The composite race variables in the 2002 through present NIS public-use data files, however, contain only three categories: non-Hispanic white alone; non-Hispanic black alone; and non-Hispanic all other races alone and non-Hispanic multi-racial. (The variable RACE_K classifies each child into one of these three categories, while the variable RACEETHK includes a separate "Hispanic" category.) The "all other races alone" category includes Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and other races. If more than one race was selected during administration of the child race questions, the child is classified as multi-racial. Because of small sample sizes and risk of disclosure within estimation areas, the 2002 through present public-use data files do not contain any variables with separate multiple-race categories. Rather, the multi-racial children are included in the "all other races" category. Table 4 shows some characteristics of the current race/ethnicity categories.

Table 4: Weighted Distribution of Children by Race/Ethnicity and Corresponding 4:3:1:3*:3:1:4, Pneumococcal, and Varicella Vaccination Coverage Estimates, National Immunization Survey, 2013

Race/Ethnicity Classification (RACEETHK)	**Weighted Distribution of Children ages 19-35 Months in U.S.** **Estimate (%)**	**Weighted Percentage 4:3:1:3*:3:1:4 UTD** **Estimate (%) (Standard Error (%))**	**Weighted Percentage 4+ Pneumococcal** **Estimate (%) (Standard Error (%))**	**Weighted Percentage 1+ Varicella at 12+ Months** **Estimate (%) (Standard Error (%))**
Hispanic	27.20	71.79 (1.90)	80.41 (1.72)	91.97 (1.27)
Non-Hispanic white only	47.89	74.14 (0.88)	84.11 (0.78)	90.03 (0.59)
Non-Hispanic black only	12.65	67.00 (2.23)	76.11 (1.96)	92.12 (1.12)
Non-Hispanic American Indian or Alaska Native only	1.08	70.68 (4.70)	79.01 (4.26)	95.41 (1.57)
Non-Hispanic Asian only	4.58	77.55 (3.07)	85.56 (2.76)	95.97 (1.02)
Non-Hispanic Native Hawaiian or Pacific Islander only	0.27	71.73 (8.21)	77.18 (7.53)	88.72 (4.70)
Multiracial	6.32	72.71 (2.64)	82.97 (2.25)	91.03 (1.51)
Non-Hispanic white/black	2.67	73.53 (4.10)	84.56 (3.24)	91.26 (2.42)
Non-Hispanic white/ American Indian or Alaska Native	0.85	70.57 (6.32)	77.80 (5.96)	82.88 (5.86)
Non-Hispanic white/Asian	1.60	79.23 (4.98)	92.26 (3.15)	93.75 (2.08)
Non-Hispanic other combination	1.20	63.69 (6.45)	70.71 (6.48)	92.68 (2.62)

Note: UTD = up-to-date. Weighted by PROVWT_D. Children with an unknown Hispanic origin and/or race were imputed by a hot-deck method. This table includes both landline and cell-phone interviews, but excludes U.S. Virgin Islands and Guam.

4.8. Sub-Sets of the NIS Data

The NIS public-use data file contains data for all eligible children who have a completed household interview. An interview is considered complete if the respondent completed Section C of the questionnaire. As explained in Section 6 of this guide, each child with a completed household interview is assigned a weight **(RDDWTVIGU_D for U.S. proper plus U.S. Virgin Islands and Guam, including both landline and cell-phone sample children; RDDWT_D for U.S. proper alone, including both landline and cell-phone sample children)** for use in estimation.

The NIS uses the synthesized provider-reported vaccination histories to form the estimates of vaccination coverage because the provider data are considered more accurate than household-reported data. Thus, the most important sub-set of the data consists of children with adequate provider data. For these children, one or more providers returned the immunization history questionnaire, and the vaccination information reported by those providers is sufficient to determine whether the child is up-to-date on the recommended vaccinations. Unvaccinated children are also considered to have adequate provider data. As discussed in Section 7 below, the PDAT variable identifies the children with adequate provider data (PDAT=1). These children have a separate weight (**PROVWTVIGU_D for U.S. proper plus U.S. Virgin Islands and Guam, including both landline and cell-phone sample children; PROVWT_D for U.S. proper alone, including both landline and cell-phone sample children**), which should be used to form estimates of vaccination coverage (see Section 6).

4.9. Confidentiality and Disclosure Avoidance

To prevent identification of participants in the NIS and the resulting disclosure of information, certain items from the questionnaires are not included in the public-use data file. In addition, some of the released variables either are top- or bottom-coded, or have their categories collapsed. Variable labels indicate which variables have been re-coded in these ways.

5. Quality Control and Quality Assurance Procedures

A major contributor to NIS data quality is its sample management system, which in 2013 managed over 450 sample frame by estimation area by quarter samples and used a number of performance measures to track their progress toward completion. Important aspects of the quality assurance program for the RDD component of the NIS included on-line interviewer monitoring; on-line provider look-ups in a database system integrated with the CATI system, including names, addresses, and telephone numbers of vaccination providers; and automated range-edits and consistency checks. These and other quality assurance procedures contributed to a reduction in total data collection cost by minimizing interviewer labor and overall burden to respondents. Khare et al. (2000), Khare et al. (2001), and the *National Immunization Survey: Guide to Quality Control Procedures* (CDC 2002) describe quality assurance procedures.

The Provider Record Check component used quality control measures at four junctions: prior to mailing packets to providers; during the telephone prompting effort; during the editing of returned questionnaires; and during and after their data entry. The final quality assurance activities are implemented during post-processing of the returned questionnaires or vaccination records. All returned questionnaires were examined to identify and correct any obvious errors prior to data entry and then key-entered with 100 percent verification. The keying error rate is estimated, by way of a second verification process, to be less than 1 percent.

6. Sampling Weights

Each of the two phases of data collection results in a separate sampling weight for each child who has data at that phase. The RDD-phase sampling weights permit analyses of data from children with completed household interviews. Each child with adequate provider data (the sub-set on which official estimates of vaccination coverage are based) has a provider-phase sampling weight. **The RDD-phase sampling weights are called RDDWT_D for both landline and cell-phone sample interviews in the U.S. proper (i.e. set to missing for the U.S Virgin Islands and Guam), and are used to produce dual-frame estimates in the U.S. proper; RDDWTVIGU_D for both landline and cell-phone sample interviews in the U.S. proper, the U.S Virgin Islands, and Guam, are to be used to produce dual-frame estimates in the U.S. proper, the U.S. Virgin Islands, and Guam. The provider-phase sampling weights of children with adequate provider data are called PROVWT_D for both landline and cell-phone sample interviews in the U.S. proper (i.e., set to missing for the U.S. Virgin Islands and Guam), are to be used to produce dual-frame estimates in the U.S. proper; PROVWTVIGU_D for both landline and cell-phone sample interviews in the U.S. proper, the U.S Virgin Islands, and Guam, are to be used to produce dual-frame estimates in the U.S. proper, the U.S. Virgin Islands, and Guam.** As discussed below, revisions in weighting methodology were made on various occasions and the names of the weight variables were also changed to keep track of the revisions. The RDD sampling weights were called HY_WGT in 1995-2001, RDD_WT in 2002, WGT_RDD in 2003 and 2004, RDDWT in 2005-2008, RDDWT/RDDWTVI from 2009-2010, RDDWT_LL/RDDWTVI_LL/RDDWT_D in 2011, RDDWT_D/RDDWTVI_D in 2012, and RDDWT_D/RDDWTVIGU_D IN 2013. The provider-phase sampling weights were called W0 in 1995-2001, WT in 2002, WGT in 2003 and 2004, PROVWT in 2005-2008, PROVWT/PROVWTVI from 2009-2010, PROVWT_LL/PROVWTVI_LL/PROVWT_D in 2011, PROVWT_D/PROVWTVI_D in 2012, and PROVWT_D/PROVWTVIGU_D IN 2013.

A sampling weight may be interpreted as the approximate number of children in the target population that a child in the sample represents. Thus, for example, the sum of the sampling weights of children who are up-to-date (on a particular vaccine or series of vaccines) yields an estimate of the total number of children in the target population who are up-to-date. Dividing this sum by the total of the sampling weights for all children gives an estimate of the corresponding vaccination coverage rate.

This section describes how these weights are developed and adjusted so as to achieve an accurate representation of the target population. The base weights reflect each telephone number's probability of being selected into the sample; the adjustments take into account non-resolution of residential/non-residential/non-working status of a telephone number, non-response to the screener and household interviews, number of telephone lines in the household, combination of landline and cell-phone sample sources, raking for differential coverage rates and non-coverage of households that do not have telephones, non-response by providers, and a final raking adjustment. Note that when deriving dual-frame weights, initial adjustments described below are performed separately for the landline and cell-phones samples, and then both samples are combined and further adjustments are performed on the combined samples.

6.1. Base Sampling Weight

In each quarterly NIS sample, each child with a completed household interview receives a base sampling weight. For all four quarters of the landline sample and cell-phone samples, the base sampling weight is equal to the total of telephone numbers in the sampling frame for the estimation area divided by the total of telephone numbers that were randomly sampled from that sampling frame and released for interview during that quarter.

6.2. Adjustments for Non-Resolution of Telephone Numbers, Screener Non-Response, and Interview Non-Response

Non-response occurs in population-based surveys when respondents refuse to participate, are not available at the time of the interview, or could not be reached during the survey period. Thus, the sum of the base sampling weights of children with completed household interviews will underestimate the size of the target population in the estimation area, because not all sampled households respond to all stages of data collection up to the household interview. As a result, the base sampling weights must be adjusted so they accurately reflect the number of children in the target population that each sampled child with a completed household interview represents.

Some sampled households with age-eligible children fail to complete the household interview because of unit non-response: some telephone numbers are never determined to be residential despite multiple call attempts; some households cannot be determined to have age-eligible children; and some households with age-eligible children do not complete the household interview. To compensate for these three types of unit non-response, the sampling weights of children with a completed household interview are adjusted to account for the estimated number of age-eligible children in households whose telephone numbers are never determined to be residential, the estimated number of age-eligible children in households that fail to complete the screening interview, and the number of identified age-eligible children for whom the household interview is not completed. For the landline sample, each of these adjustments is carried out within estimation areas by forming weighting cells based on the residential directory-listed status of the sample telephone number, percent of the population that is white in the telephone exchange, and MSA status of the telephone exchange (e.g., weighting cells were formed from directory-listed versus non-directory-listed telephone number; by telephone exchanges with 75 percent or higher white population versus telephone exchanges with less than 75 percent white population; and MSA/non-MSA status). For the cell-phone sample, each of these adjustments is carried out within estimation area by forming weighting cells based on MSA/non-MSA status of the wire center associated with the cell-phone number. Each cell in each stage of adjustment must have sufficient resolved/responding cases (usually 20, but 15

for interview non-response) at that stage of adjustment; cells with a deficient number of responding cases are collapsed with neighboring cells. The order of the variables in cell collapsing for the landline sample is MSA status, percent of population that is white, and directory listed status of the telephone number, and for the cell-phone sample, both MSA categories are collapsed if either of the cells have a deficient number of responding cases. Once the adjustment cells are formed, the weights of the unresolved/non-responding records from the previous adjustment step are distributed to the weights of the resolved/responding records within each cell.

6.3. Adjustment for Multiple Telephone Lines and Deriving Annual Weights

Once the non-response-adjusted interview weights for households are computed, these weights are adjusted for additional telephone lines in the household. Because households with multiple telephone lines have a greater chance of being sampled, for the landline sample, each child's household interview weight is adjusted by dividing it by the total number of residential telephone landlines reported in the household (up to a maximum of 3), and for the cell-phone sample, each child's household interview weight is adjusted by dividing it by the total number of cell-phones used by parents or guardians (up to a maximum of 3). Prior to 2005, the adjustment for multiple telephone lines was made by adjusting the base sampling weights before making any other adjustments. Beginning in 2005, the adjustment for multiple telephone lines has been shifted after the interview non-response adjustment, because the information on the number of telephone lines in a household is available only for households with completed household interviews. This shifts the adjustment for multiple telephone lines to the point where the information about the number of telephone lines is actually collected.

Up to the previous step, the sampling weights are adjusted separately for each quarter and sample type (landline, cell-phone), and the weights in each quarter pertain to the target population. However, annual vaccination coverage estimates are obtained from data for four consecutive quarters, so the weights in

each quarterly file are adjusted when the data from the four quarters of the landline and cell-phone samples are combined. The adjustment factor is proportional to the number of households with completed household interviews in each quarter within sample type (landline, cell-phone) and estimation area.

6.4. Post-Stratification

Survey weights for the landline and cell-phone samples must be integrated to provide dual-frame weights for the full target population of age eligible children. The landline and cell-phone sampling frames overlap in coverage of children in landline and cell-phone dual use households and exclude children in phoneless households.

The critical issues associated with combining the landline and cell-phone samples are: a) adjustment for overlap of the landline and cell-phone samples; and b) adjustment for noncoverage of children in phoneless households.

The weighting adjustment for children living in phoneless households for the 2013 NIS was modified from the 2012 NIS to account for changes in the 2013 NIS sample design. In 2012, children with completed household interviews from the landline sampling frame and living in households with an interruption in landline telephone service were used to represent children living in phoneless households. However, under the 2013 sample design for NIS, there were far fewer landline sample children, and thus, fewer children in households with an interruption in landline telephone service. Hence, it was no longer feasible to use landline interruption children to represent phoneless children, and instead phoneless children were accounted for in weighting in the socio-demographic raking adjustment.

Prior to combining the landline and cell-phone samples, survey weights are adjusted to agree with independent estimates of the population by telephone status relative to the three categories corresponding to cell-phone-only, landline and cell-phone dual user, and landline-only. Adjustments to population

estimates of the landline and cell-phone dual user population is made separately for the landline sample and the cell-phone sample (with the overlap adjusted for in the next step, as explained below).

The proportion of 19 to 35 month old children by detailed telephone status (cell-phone-only, landline and cell-phone dual user, landline-only, phoneless) within each estimation area were derived using a similar small area modeling approach as described in Blumberg et al. 2011. These modeled telephone status estimates are applied to the population control total for the estimation area to estimate the control totals by detailed telephone status within the estimation area.

The cell-phone and landline samples must be combined to provide weights for the full target population of 19 to 35 month old children. Since the cell-phone and landline sampling frames overlap in coverage of children in cell and landline dual use households, dual users from both samples are combined based on the number of children with a completed household interview within each sample type (landline, cell-phone), and are weighted to represent children in dual use households within each estimation area. Similarly, children in cell-phone-only and landline-only households within each estimation area are respectively weighted to represent children in cell-phone-only and landline-only households.

To reduce sampling variability and improve the precision of estimation, extreme weights are trimmed and then recalibrated to control totals. RDD sampling weight values exceeding the median weight plus three times the interquartile range of the weights within an estimation area are truncated to that threshold. This weight trimming prevents children with unusually large weights from having an unusually large impact on immunization coverage estimates.

The final step in adjusting the RDD sampling weights is a raking adjustment (Deming 1943) of the trimmed, telephone status adjusted weights. The raking procedure used estimation area-level control totals for maternal education categories, maternal race/ethnicity, age group of the child, gender of the child, and telephone status. Briefly, raking takes each variable in turn and applies a proportional adjustment to the current weights of the children who belong to the same category of the variable. After a number of

iterations over all the variables, the raked weights have totals that match all the desired control totals. Raking makes it possible to incorporate additional variables into the weighting and to use more detailed categories for those variables. Smith et al. (2005) gives the details of various aspects of the NIS estimation procedures.

The base sampling weights after all the foregoing adjustments constitute the "RDD sampling weights" (RDDWTVIGU_D for U.S. proper plus U.S. Virgin Islands and Guam dual-frame weights; RDDWT_D for U.S. proper dual-frame weights).

The control totals used for the NIS are derived from current natality data from the National Center for Health Statistics (NCHS 2010, 2011). Because the Vital Statistics data give the counts of all live births in the U.S., regardless of whether the household has telephone service, the control totals include all eligible children. The control total for each post-stratification cell is derived from the NCHS natality file from 2010 and 2011 (children born between July 1, 2010 and November 30, 2011 would have been 19 to 35 months on June 30, 2013). Use of the natality data to form the required population control totals for the NIS has three limitations: 1) the natality file provides a universe of live births and therefore does not reflect infant mortality; 2) the natality file does not include children born outside the United States who immigrate to this country before reaching ages 19 to 35 months; and 3) the natality file records residence at time of birth, and some children may move from one estimation area to another by the time they reach 19 to 35 months of age. Adjustments are made to the natality data to account for these three factors. **For 2013, the methodology is similar to that for 2012 except instead of using 2009-2011 American Community Survey Public-Use Microdata Sample (PUMS) data, 2010-2012 American Community Survey PUMS data were used to make the immigration and migration adjustments.**

6.5. Adjustment for Provider Non-Response

Among the 23,248 children with a completed household interview from the landline and cell-phone samples (including U.S. Virgin Islands and Guam), 14,060 (60.5 percent) had adequate provider data.

Starting with the 2002 public-use data file, the definition of children with adequate provider data includes unvaccinated children. These are children for whom the respondent reported during the household interview that the child had received no vaccination and has no immunization providers, or for whom one or more immunization providers were reported but those providers reported administering no vaccinations. Among the 14,060 children with adequate provider data, 156 were unvaccinated children. Failure to obtain adequate provider data for the remaining 39.5 percent was attributable to:

- parent or guardian not identifying any providers or not giving consent to contact the child's vaccination provider(s) (31.9 percent);
- children with one identified provider but inadequate information to contact the provider, or the provider did not respond, or the provider responded but did not report any immunization information for the child (6.5 percent); and
- children with two or more identified providers but not all the providers responded, and responding providers did not report sufficient information to determine the child's vaccination status (1.1 percent).

The 9,188 children for whom a household interview was completed but adequate provider data were not obtained are classified as "partial non-responders" because they have only a partial response to the NIS as a whole.

Empirical results suggest that children with adequate provider data have characteristics believed to be associated with a greater likelihood of being up-to-date, compared with children who had missing provider data. Specifically, children with adequate provider data are more likely to live in households that have higher total family income, have a white mother, and live outside a central city of a Metropolitan Statistical Area. Also, a child with missing provider data is less likely to live in the state where the mother lived when the child was born. These factors indicate a potential lack of continuity of health care, and are

associated with lower vaccination rates (Coronado et al. 2000). If no adjustment is made to the RDD sampling weights to account for these differences, estimated vaccination coverage rates may be biased.

To reduce potential bias in estimators of vaccination coverage attributable to partial non-response, a weighting-class adjustment is used in each estimation area (Brick and Kalton 1996). This adjustment involves three steps. In the first step, sampled children are classified according to the quintile of their estimated probabilities of having adequate provider data. In the statistical literature these probabilities are called response propensities (Rosenbaum and Rubin 1983, 1984; Rosenbaum 1987). Children who have similar response propensities will also be similar with respect to variables that are strongly associated with the probability of having adequate provider data. In this important respect, children in each class are comparable. Because of this comparability, any sub-sample of children in a class may represent all children in the class. Therefore, the weighting-class adjustment uses the children with adequate provider data to represent all children in the class. An NCHS Series 2 Report on the statistical methodology of the NIS (Smith et al. 2005) includes details of the methodology for forming weighting classes based on propensity scores. This report can be viewed at http://www.cdc.gov/nchs/data/series/sr_02/sr02_138.pdf.

In the second step of this weighting-class adjustment, within each class an adjustment factor redistributes the RDD sample weights of the children with missing provider data to the weights of the children who have adequate provider data. These adjusted sampling weights of children with adequate provider data are initial non-response-adjusted provider-phase weights. The model for children with adequate provider data includes significant main effects, and also significant two-way interactions between sample type (landline, cell-phone) and all other variables.

Within an estimation area, the sums of non-response adjusted weights of children with adequate provider data for the various levels of important socio-demographic variables (such as race/ethnicity) may not be equal to corresponding population totals. To reduce bias attributable to these differences, raking was used in the third step to adjust the non-response adjusted weights to

match estimation area control totals. Control totals for these variables were estimated using the weighted totals from the sample of children with completed household interviews. Smith et al. (2001b, 2005) describe the development of this approach in more detail. These raked weights of children with adequate provider data are called "final provider-phase weights" (PROVWTVIGU_D for U.S. proper dual-frame weights plus U.S. Virgin Islands and Guam landline and cell-phone sample weights; PROVWT_D for U.S. proper dual-frame weights). Because of the comparability of children within each weighting class, any estimate that uses data only from the children with adequate provider data, along with their provider-phase sampling weights, will have less bias attributable to differences between children with adequate provider data and children with missing provider data.

Appendix B summarizes the distribution of the sampling weights (RDDWT_D, PROVWT_D, RDDWTVIGU_D, and PROVWTVIVIGU_D) in each estimation area.

NIS public-use data files for 1995 to 2001 do not include sampling weights that account for the effect of unvaccinated children. An assessment of the effect of accounting for unvaccinated children for the period 1995 to 2003 was made. Weights were calculated for each year with and without unvaccinated children and the vaccination coverage estimates compared. Details of this assessment and the results are available in the user's guide for the 2004 public-use data file. At the national level, accounting for unvaccinated children had very little effect on the estimates of 4:3:1:3 vaccination coverage. Within estimation areas also, the two coverage estimates differed little. The largest difference (in either direction) was most often around 2 percentage points. Differences of that magnitude are small relative to the standard errors of the estimates. Although accounting for unvaccinated children has a small effect on estimates of vaccination coverage, data users who use the public-use data files to examine estimation area-level trends over time are advised to interpret the results with appropriate caution.

6.6. Sampling Weights for the U.S. Virgin Islands and Guam

The NIS weighting process was followed as closely as possible for U.S. Virgin Islands and Guam. Due to differences in the availability of external data sources for U.S. Virgin Islands and Guam, slight changes were necessary to accurately estimate vaccination rates for this area. These differences are stated below.

In step 6.2, each of the non-response adjustments for U.S. Virgin Islands and Guam was done at the estimation area level. That is, no weighting cells were formed for U.S. Virgin Islands and Guam.

Similar to the dual-frame weights for U.S. proper, the final step in adjusting the RDD sampling weights for U.S. Virgin Islands and Guam is a raking adjustment. **For Guam, a different set of race/ethnicity categories were used for post-stratification and raking adjustments than were used in other areas. The Guam race/ethnicity categories were: Chamorro/Guamanian, Asian/Other Pacific Islander including Hawaiian, and All Other. In step 6.4, the adjustment to the control totals for U.S. Virgin Islands and Guam to account for immigration and migration used 5-percent PUMS from the 2010 Census instead of 2010-2012 American Community Survey data.**

After sampling weights were calculated for all children in all estimation areas, including Guam and U.S. Virgin Islands, they were stored in the variables RDDWTVIGU_D and PROVWTVIGU_D. These weight variables permit one to conduct analysis of all estimation areas, including Guam and U.S. Virgin Islands. The weight variables RDDWT_D and PROVWT_D are equal to RDDWTVIGU_D and PROVWTVIGU_D for all children, except for children in U.S. Virgin Islands and Guam, for whom the value of these weight variables is blank or missing. RDDWT_D and PROVWT_D permit one to conduct analysis of all estimation areas, excluding U.S. Virgin Islands and Guam.

7. Contents of the Public-Use Data File

The NIS public-use data file contains a record for each eligible child for whom Section C of the household interview was completed, along with household-reported vaccination information and demographic information about the child and the child's mother. (Because of reporting and recall errors, the household report of vaccinations is not used to produce vaccination coverage rates. Vaccination coverage rates are based on the provider-reported data.) For children with Immunization History Questionnaires (IHQs) containing vaccination data returned by one or more providers, the file also contains provider characteristic variables, as well as variables based on the child's synthesized provider-reported vaccination history: the age of the child at each vaccination, the number of each type of vaccination received, and indicators of whether the child is up-to-date with respect to various recommended vaccines and vaccine series.

The public-use data file consists of ten sections, the contents of which are described below in detail. For additional information, users are encouraged to consult the codebook (NCHS 2014). The codebook is divided into the ten sections described below and contains variable names, labels, and response frequencies (for categorical variables). For select variables, the codebook also gives additional information about the variable in the "Notes" field.

Table 5 lists key NIS variables commonly used in analyses. A full list of variables appearing on the 2004-2013 public-use data files appears in Appendix E, along with the reason for the addition, subtraction, or modification of the variables in 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, or 2013. Information on changes made between 1995-2004 can be found in the *Alphabetical Listing of Variables that are Not Available in All Public-Use Data Files, National Immunization Survey, 1995-2004*. www.cdc.gov/nchs/data/nis/pufvariables1995to2004.pdf

Table 5: NIS Variables Commonly Used in Analyses or for Published Estimates

Variables	
ID Variables	
SEQNUMC – unique child ID variable	
SEQNUMHH – unique household ID variable	
Geographic Variables	
ESTIAP13 – estimation area number (introduced in 2008; ITRUEIAP used through 2004; ESTIAP in 2005; ESTIAP06 in 2006; ESTIAP07 in 2007; ESTIAP08 in 2008; ESTIAP09 in 2009; ESTIAP10 in 2010; ESTIAP11 in 2011; ESTIAP12 in 2012; ESTIAP13 in 2013)	
STATE – state FIPS code	
CEN_REG – census region	Northeast Midwest South West
Child Demographic Variables	
AGEGRP – age category of child	19-23 months 24-29 months 30-35 months
RACEETHK – race/ethnicity of child (introduced in 2002; RACEKIDR used in 1995-2001)	Hispanic White alone, non-Hispanic Black alone, non-Hispanic All other races alone and multi-racial, non-Hispanic
SEX – gender of child	Male Female
FRSTBRN – firstborn status of the child	No Yes
Mother Demographic Variables	
EDUC1 – education of the mother	<12 years 12 years >12 years, not a college graduate College graduate
MARITAL2 – marital status of mother	Currently married Never married, widowed, divorced, separated, or deceased
M_AGEGRP – age group of mother	<=19 years 20-29 years 30 years or older
Poverty Variables	
INCPOV1 – poverty status (introduced in 2005; INCPOV1R used through 2004)	At or above poverty level, income > $75,000 At or above poverty level, income <= $75,000 Below poverty level Not determined
INCPORAR – income-to-poverty ratio (introduced in 2005; INCPORAT used through 2004)	
WIC Variables	

Variables	
CWIC_01 – child ever participated in WIC program	Yes No Never heard of WIC Don't know Refused Missing
CWIC_02 – child currently participating in WIC program	Yes No Don't know Refused Missing
Breastfeeding Variables	
CBF_01 – child ever fed breast milk	Yes No Don't know Missing
BF_ENDR06 – length of time in days child was fed breast milk	
BF_EXCLR06 – length of time in days child was exclusively fed breast milk or formula (introduced in 2006)	
BF_FORMR08 – age in days when child was first fed formula (introduced in 2008; BF_FORMR06 used in 2006 and 2007)	
Chicken Pox Variables	
HAD_CPOX – did child ever have chicken pox (introduced in 2005; I_HADCPX used through 2004)	Yes No Don't know Refused Missing
AGECPOXR – age in months when child had chicken pox (introduced in 2005; IAGECPXR used through 2004)	0-6 months 7-12 months 13-18 months 19-24 months 25-30 months 31 months or older Missing
Presence of Provider Data Variables	
PDAT – adequate provider data indicator	Yes No
Number of Provider-Reported Doses of Vaccine Variables	
P_NUMDTP – total number of DTP/DTaP doses	
P_NUMPOL – total number of polio doses	
P_NUMMMR – total number of MCV doses	
P_NUMHIB – total number of Hib doses	
P_NUMHEP – total number of hepatitis B doses	
P_NUMVRC – total number of varicella doses	
P_NUMPCV – total number of pneumococcal doses	
P_NUMFLU – total number of seasonal influenza doses	
P_NUMH1N – total number of monovalent 2009 H1N1 influenza doses	

Variables	
P_NUMHEA – total number of hepatitis A doses	
P_NUMROT – total number of rotavirus doses	
Provider Characteristic Variables	
PROV_FAC – provider facility type	All public facilities All hospital facilities All private facilities All military/other facilities All WIC clinic providers Mixed types Unknown
VFC_ORDER – do child's providers order vaccines for children from state/local health department? (introduced in 2006)	All providers Some but not all providers No providers Unknown
REGISTRY – provider(s) reported child's vaccination(s) to state or community immunization registry	All providers Some but not all providers No providers Unknown

Before describing the sections of the public-use data file below, we first summarize the differences between the 2012 and 2013 public-use data files:

- **Because the 2013 estimation areas differ from those used in 1995-2004 and from those used in 2005, 2006, 2007, 2008, 2009, 2010, 2011, and 2012, a new 2013 estimation area variable has been added (ESTIAP13) and the 2012 estimation area variable (ESTIAP12) has been dropped.**
- **The 2013 PUF includes interviews for children in Guam, which was not an estimation area in 2012. On the 2012 PUF, RDDWTVI_D and PROVWTVI_D were the weights used to produce dual-frame estimates in the U.S. including the U.S. Virgin Islands. On the 2013 PUF, use RDDWTVIGU_D and PROVWTVIGU_D to produce dual-frame estimates in the U.S. including the U.S. Virgin Islands and Guam. See Section 8 of this user's guide for more information about the appropriate weights to use for various analyses.**
- **The H1N1 influenza section of the IHQ shotgrid was removed in Q3/2013. As a result, all provider-reported H1N1 flu vaccination variables have been removed from the PUF.**

7.1. Section 1: ID, Weight, and Flag Variables

SEQNUMHH and **SEQNUMC** are the unique household and child identifiers, respectively. **PDAT** indicates which children are considered to have adequate provider data. **As described in Section 6 of this report, RDDWTVIGU_D/RDDWT_D and PROVWTVIGU_D/PROVWT_D are the final household- and provider-phase weights, respectively. PROVWTVIGU_D/PROVWT_D should be used when analyzing the provider-reported data, i.e., the variables in Sections 7, 8, and 9 of the public-use data file.**

7.2. Section 2: Household-Reported Vaccination and Chickenpox Information

Section 2 of the public-use data file contains variables derived from the information collected in Section B of the household questionnaire. In particular, it contains variables indicating whether respondent reported that the child has had chicken pox disease (**HAD_CPOX**) and the child's age in months at chicken pox disease (**AGECPOXR**).

7.3. Section 3: Demographic, Socio-Economic, and Other Household/Child Information

Section 3 of the public-use data file consists of information collected during the household screening interview and Section C of the household main interview. To protect confidentiality, many of these variables have been collapsed, top-coded, or bottom-coded from the original, fully-detailed versions; the variable labels (see the public-use date file codebook) indicate which variables have been collapsed or recoded.

AGEGRP is the age of the child in years in three categories (19-23 months, 24-29 months, 30-35 months), based on the child's best date of birth and the eligibility date. **SEX** gives the gender of the child, and **FRSTBRN** indicates whether the child is the first born, with missing values of these variables

imputed. The language in which the interview was conducted is stored in variable **LANGUAGE**, and **C5R** gives the relationship of the respondent to the child.

The breastfeeding variables include whether the child was ever fed breast milk (**CBF_01**), length of time in days the child was fed breast milk (**BF_ENDR06**), the age in days when the child was first fed formula (**BF_FORMR08**), and the length of time in days the child was exclusively fed breast milk or formula (**BF_EXCLR06**). Two types of inconsistencies arise in the breastfeeding data: 1) duration of any breastfeeding can exceed age of the child, and 2) age when the child was first fed formula can exceed the age of the child. **BFENDFL06** is set equal to 1 when BF_ENDR06 exceeds the age of the child (with a buffer), and **BFFORMFL06** is set equal to 1 when BF_FORMR08 exceeds the age of the child (with a buffer). Appendix C provides details on how the flags were created. Data users are cautioned to review Appendix C before analyzing any of the breastfeeding variables.

The WIC variables include whether the child ever participated in the WIC program (**CWIC_01**) and whether the child is currently participating (**CWIC_02**).

C1R and **CHILDNM** give the number of people and children, respectively, in the household. The child's Hispanic origin indicator, race with three categories, and race/ethnicity with four categories are presented in variables **I_HISP_K**, **RACE_K**, and **RACEETHK**, respectively; for each of these variables, missing values have been imputed. The age, education level, and marital status of the mother of the child are stored in variables **M_AGEGRP**, **EDUC1**, and **MARITAL2** (married vs. not married), with missing values imputed.

The categorized total combined income for the child's family is given by **INCQ298A**; **INCPOV1** gives the family's poverty status (at or above poverty, income > $75,000; at or above poverty, income <= $75,000; below poverty; unknown), and **INCPORAR** gives the ratio of the family's income to the poverty level. Household tenure is given by **RENT_OWN**.

The number of landline telephone numbers in the household, the number of working cell phones household members have available for personal use, and the number of these cell phones that are usually used by parents or guardians are given by **NUM_PHONE**, **NUM_CELLS_HH**, and **NUM_CELLS_PARENTS**, respectively.

Variable **CEN_REG** gives the census region of the respondent's current residence, and **MOBIL_I** indicates whether the mother's current state of residence is the same as her state of residence at the time of the child's birth.

7.4. Section 4: Geographic Variables

Variables **ESTIAP13** and **STATE** give the 2013 estimation area and state of residence, respectively, for each child. **EST_GRANT** gives the 56 core NIS grantee geographical area of residence for the U.S. proper.

7.5. Section 5: Number of Providers Identified and Consent Variables

Variable **D7** indicates whether the respondent gave consent to contact the child's providers. If D7=1, then consent was granted; if D7=2 then consent was explicitly denied; and if D7 is missing, consent was not granted because the respondent broke off the interview before being explicitly asked for consent.

Variable **D6R** gives the number of providers identified by the respondent. Note that sometimes respondents report erroneous provider counts and sometimes report the same provider more than one time, and D6R does not reflect cleaning or de-duplication of the initially-reported provider count.

7.6. Section 6: Number of Responding Providers Variables

Variable **N_PRVR** indicates the number of providers returning IHQs with vaccination information for the child. That is, N_PRVR is the number of IHQs that were returned for the child that contain information on the IHQ shot grid.

7.7. Section 7: Characteristics of Providers Variables

The variables in this section of the public-use file summarize the information collected in IHQ questions 6, 7, and 8 across the child's providers who returned IHQs containing vaccination (i.e., shot grid) data.

PROV_FAC indicates the facility type of the child's vaccination providers based on responses to IHQ question 5c. If all of the child's providers that returned IHQs containing shot grid data (see Section 6 variable N_PRVR) reported their facility type to be:

- a federally-qualified health center or a public health department-operated clinic, then PROV_FAC=1 (all public facilities);
- a hospital, then PROV_FAC=2 (all hospital facilities);
- a private practice, then PROV_FAC=3 (all private facilities);
- a military, WIC clinic, school or other type of facility, then PROV_FAC=4 (all school/ military/ WIC clinics/other facilities)

If the responses of providers that returned IHQs containing shot grid data fell into more than one of the above bulleted categories, PROV_FAC=5 (mixed); otherwise, if at least one of the child's providers returned an IHQ containing shot grid data, PROV_FAC=6 (unknown). If none of the child's providers returned an IHQ containing shot grid data, PROV_FAC is set to missing.

VFC_ORDER, based on responses to IHQ question 6, indicates whether the child's vaccination providers order vaccines from a state or local health department to administer to children. If all of the child's providers that returned IHQs containing shot grid data (see Section 6 variable N_PRVR) reported that they order vaccines from a state or local health department to administer to children, then VFC_ORDER=1 (all providers); if at least one of the child's providers that returned an IHQ containing shot grid data reported that the practice orders vaccines from a state or local health department to administer to children and the child's other providers that returned IHQs containing shot grid data reported either that they did not order such vaccines or that they did not know whether or not they did, then VFC_ORDER=2 (some but possibly or definitely not all providers); if all of the child's providers

that returned IHQs containing shot grid data reported that they do not order vaccines from a state or local health department to administer to children, then VFC_ORDER=3 (no providers); if none of the conditions for VFC_ORDER=1, 2, or 3 was met but at least one of the child's providers returned an IHQ containing shot grid data, VFC_ORDER=4 (unknown). If none of the child's providers returned an IHQ containing shot grid data, VFC_ORDER is set to missing.

REGISTRY is based on responses to IHQ question 7 and indicates whether the child's vaccination providers reported the child's vaccinations to a community or state registry. If all of the child's providers that returned IHQs containing shot grid data (see Section 6 variable N_PRVR) indicated that they reported to a registry, then REGISTRY=1 (all providers); if at least one of the child's providers that returned an IHQ containing shot grid data indicated that the practice reported to a registry and the child's other providers that returned IHQs containing shot grid data indicated that they did not report to a registry, that they did not know whether or not they reported to a registry, or that the question is not applicable, then REGISTRY=2 (some but possibly or definitely not all providers); if all of the child's providers that returned IHQs containing shot grid data indicated that they did not report to a registry or that the question is not applicable, then REGISTRY=3 (no providers); if none of the conditions for REGISTRY=1, 2, or 3 was met but at least one of the child's providers returned an IHQ containing shot grid data, REGISTRY=4 (unknown). If none of the child's providers returned an IHQ containing shot grid data, REGISTRY is set to missing.

7.8. Section 8: Provider-Reported Up-To-Date Vaccination Variables

This section contains vaccination count and up-to-date variables based on the child's synthesized provider-reported vaccination history. To facilitate data processing and to accommodate the large and continually growing number of vaccination types covered by the NIS, the provider-reported vaccination data are organized around the concept of vaccine categories and vaccine types within vaccine category. The vaccine categories correspond to the sections of the IHQ shot grid, and the vaccine types correspond

to the type boxes on the IHQ shot grid. (For each vaccine category, an "unknown" vaccine type is created for vaccinations that are reported without a type box being checked. Also, a few vaccine types, such as Measles-Mumps, arise through the backcoding of shots initially reported in the "other" section of the IHQ shot grid.) Table 6 shows the vaccine categories and types for the 2013 NIS. Note that a single vaccination can fall into more than one vaccine category; for example, an MMR-Varicella vaccination is part of both the Measles-containing and Varicella-containing vaccine categories. (The full list of vaccine type codes can also be found in Appendix I.)

For each vaccine category, Section 8 of the public-use data file contains a variable typically named **P_NUM*YYY*** – where "YYY" is the vaccine category abbreviation given in Table 6 – that stores the number of vaccinations in that vaccine category in the child's synthesized provider-reported vaccination history. For each vaccine type in Table 6, Section 8 also contains a variable that stores the number of vaccinations of that vaccine type in the child's synthesized provider-reported vaccination history. For example, **P_NUMDHI** is the number of DTaP/HepB/IPV shots in the child's history.

This section of the public-use data file also contains up-to-date indicators for a variety of recommended vaccines and vaccine series. These variables' names typically begin with "**P_UTD**". Additional variables indicate whether the child is up-to-date for various vaccine series. For example, **P_UTD431** indicates whether the child has received 4 or more DTaP/DTP shots, 3 or more polio shots, and one or more measles-containing shot. The variable labels indicate what is needed to be considered up-to-date for each variable, and the "Notes" field in the codebook shows the vaccine type codes (see Table 6) being included when determining whether the child is up-to-date.

Note that it is possible that the administration of the NIS interview itself prompts some respondents to vaccinate their children following the interview; to ensure that the vaccination rate estimates aren't artificially boosted because of this, the synthesized vaccination history count and up-to-date variables in

this section of the public-use data file count only vaccinations received before the date the household interview was completed.

Table 6: Vaccine Categories and Vaccine Types, National Immunization Survey, 2013

Vaccine Category Abbreviation	Vaccination Category Description	Vaccine Type Code	Vaccine Type Description
DTP	DTaP/DTP-containing vaccine	03	DTaP/DTP-containing, unknown type
		04	DTaP
		07	DTaP-Hib
		08	DTaP-HepB-IPV
		D3	DTaP-IPV-Hib
POL or POLIO	Polio-containing vaccine	08	DTaP-HepB-IPV
		20	OPV
		21	IPV
		22	Polio-containing, unknown type
		D3	DTaP-IPV-Hib
MCV or MMR	Measles-containing vaccine	30	MMR
		31	Measles only
		32	Measles-mumps
		33	Measles-rubella
		MM	Measles-containing, unknown type
		VM	MMR-Varicella
HIB	Hib-containing vaccine	07	DTaP-Hib
		43	HepB-Hib
		44	Hib-only, unknown type
		D3	DTaP-IPV-Hib
		HI	Hib-containing, unknown type
		HM	Hib-only (Merck)
		HG	Hib-only (GSK)
		HS	Hib-only (Sanofi)
HEPB or HEP	Hepatitis B-containing vaccine	08	DTaP-HepB-IPV
		43	HepB-Hib
		60	HepB-only
		HB	HepB-containing, unknown type
VRC	Varicella-containing vaccine	VA	Varicella-containing, unknown type
		VM	MMR-Varicella
		VO	Varicella-only
PCV	Pneumococcal-containing vaccine	70	**Conjugate-unknown**
		71	Polysaccharide

Vaccine Category Abbreviation	Vaccination Category Description	Vaccine Type Code	Vaccine Type Description
		72	Pneumococcal-containing, unknown type
		73	Conjugate-7
		74	Conjugate-13
HEPA or HEA	Hepatitis A-containing vaccine	HA	Hepatitis A
FLU	Seasonal influenza vaccine	FL	Seasonal flu, unknown type
		FM	Seasonal flu spray
		FN	Injected seasonal flu
MP	Mumps-only vaccine	MP	Mumps-only
MPRB or MPR	Mumps-Rubella-only vaccine	MB	Mumps-Rubella-only
RB	Rubella-only vaccine	RB	Rubella-only
ROT	Rotavirus-containing vaccine	RG	Rotarix® (GSK)
		RM	RotaTeq® (Merck)
		RO	Rotavirus, unknown type

7.8.1. Seasonal Influenza Up-To-Date Variables

Since 2003, two influenza vaccine up-to-date variables have been created (NCHS 2014). The two variables are:

P_UTDFL1: Vaccinated – For interviews conducted during year x (defined using year variable associated with the quarter), child was of age between 6 and 23 months during the entire span from 9/1 through 12/31 of year x-1, and child received at least one influenza vaccination during this period.

Not Vaccinated – For interviews conducted during year x (defined using year variable associated with the quarter), child was of age between 6 and 23 months during the entire span from 9/1 through 12/31 of year x-1, and child received no influenza vaccine during this period.

Not eligible – For interviews conducted during year x (defined using year variable associated with the quarter), child's age fell outside the span of 6 and 23 months at any point between 9/1/x-1 and 12/31/x-1.

and

P_UTDFL2: Vaccinated – For interviews conducted during year x (defined using year variable associated with the quarter), child was of age between 6 and 23 months during the entire span from 9/1 through 12/31 of year x-1, and either a) received no doses of influenza vaccine prior to 9/1/x-1, but then received two between 9/1/(x-1) and whichever is earlier, date of interview or 1/31/x or b) received at least one dose of influenza vaccine prior to 9/1/x-1 and then received one during the period 9/1/x-1 through 12/31/x-1.

Not vaccinated – For interviews conducted during year x (defined using year variable associated with the quarter), child was of age between 6 and 23 months during the entire span from 9/1 through 12/31 of year x-1, but does not qualify for the above definition.

Not eligible – For interviews conducted during year x (defined using year variable associated with the quarter), child's age fell outside the span of 6 and 23 months at any point between 9/1/x-1 and 12/31/x-1.

Starting 2007, another influenza vaccine up-to-date variable (**P_UTDFL3**) has been created. It is similar to the P_UTDFL2 variable but with slight modification in the definition of "not vaccinated". The difference between P_UTDFL2 and P_UTDFL3 is shown in Table 7. The recommendations for determining need for one or two doses of influenza vaccination for children less than nine years of age have changed since 2007 and may vary by season (http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-

specific/flu.html). The P_UTDFL2 and P_UTDFL3 variables may not accurately capture subsequent season recommendations.

Table 7: Comparison of Old Flu Up-to-Date Indicator (P_UTDFL2) and New Flu Up-to-Date Indicator (P_UTDFL3)[1]

Number of Doses in Season 1 Before 9/1/[YEAR[2]-2]	Number of Doses in Season 2 9/1/[YEAR-2] to 9/1/[YEAR-1], Left Inclusive	Number of Doses in Season 3 9/1/[YEAR-1] to 12/31/[YEAR-1][3] Inclusive	Fully Vaccinated According to P_UTDFL2	Fully Vaccinated According to P_UTDFL3	Different
0	0	0	No	No	
0	0	1	No	No	
0	0	2	Yes	Yes	
0	1	0	No	No	
0	1	1	Yes	No	X
0	1	2	Yes	Yes	
0	2	0	No	No	
0	2	1	Yes	Yes	
0	2	2	Yes	Yes	
1	0	0	No	No	
1	0	1	Yes	Yes	
1	0	2	Yes	Yes	
1	1	0	No	No	
1	1	1	Yes	Yes	
1	1	2	Yes	Yes	
1	2	0	No	No	
1	2	1	Yes	Yes	
1	2	2	Yes	Yes	
2	0	0	No	No	
2	0	1	Yes	Yes	
2	0	2	Yes	Yes	
2	1	0	No	No	
2	1	1	Yes	Yes	
2	1	2	Yes	Yes	
2	2	0	No	No	
2	2	1	Yes	Yes	
2	2	2	Yes	Yes	

[1] For children who were between the ages of 6 and 23 months (inclusive) for the entire span of 9/1/[YEAR-1] and 12/31/[YEAR-1].
[2] In this table, YEAR refers to the sampling year for the child.
[3] This date does not apply to the first three rows of this table; for the first three rows (i.e., 0 doses received prior to 9/1/[YEAR-1]) the date is INTERVIEWDATE or 1/31/[YEAR], whichever is earlier.

7.8.2. Hib Up-To-Date Variables

A Hib vaccine shortage and interim recommendation to suspend the booster dose for healthy children occurred December 2007 to September 2009 (CDC 2010). Furthermore, the NIS has historically considered children to be up-to-date for Hib if the child had 3 or more doses of any Hib-containing vaccine, but for some Hib vaccine product types, 4 doses are required. Because the NIS has historically not distinguished between product types for Hib vaccine, children who received 3 doses of a vaccine product that required 4 doses were misclassified as up-to-date for Hib (CDC 2010).

Because of the Hib vaccine shortage and because of the dependence of the Hib recommendation on product type, in 2009 the IHQ was modified to capture the manufacturer of the Hib vaccinations the child has received. Beginning with the 2009 NIS public-use data file, new up-to-date variables were added to indicate up-to-date status based on Hib recommendation (i.e., the primary series recommended during the shortage vs. the full series) and on the Hib manufacturer.

Table 8 shows the Hib up-to-date variables appearing on the public-use-date file beginning in 2009: in addition to the existing up-to-date indicator based on 3+ Hib of any type (P_UTDHIB), an indicator based on the "shortage" (i.e., primary series) recommendations accounting for manufacturer (3+ Hib of any type or 2+ Hib of Merck types) and an indicator based on the "routine" (i.e., full series) recommendations accounting for manufacturer (4+ Hib of any type or 2 Hib of Merck types followed by 1 Hib of any type) were added. Table 9 shows the up-to-date series variables that include Hib appearing on the public-use-date file beginning in 2009: in addition to the existing vaccine series up-to-date variables based on 3+ Hib of any type (PUTD4313, PUT43133, PU431331, PU4313313, PU4313314), variables based on the "routine" (i.e., full series) Hib recommendations accounting for manufacturer (4+ Hib of any type or 2 Hib of Merck types followed by 1 Hib of any type) were added have been added (P_UTD431H_ROUT_S, P_UTD431H3_ROUT_S, P_UTD431H31_ROUT_S, P_UTD431H313_ROUT_S, P_UTD431H314_ROUT_S).

Note that for these Hib up-to-date variables that account for the manufacturer, if the manufacturer is unknown because the provider failed to check a type box on the IHQ, it has been assumed that the manufacturer of the Hib vaccine is not Merck; that is, these variables are based on a "strict" treatment of Hib vaccinations of unknown type, erring on the side of classifying the child as not up-to-date.

Beginning with the 2010 public-use data file, two new vaccination series up-to-date indicators were added that ignore the Hib component altogether. These are PU431_31 (indicates up-to-date status as measured by PU431331, but excluding the Hib component) and PU431_314 (indicates up-to-date status as measured by PU4313314, but excluding the Hib component).

Table 8: Up-To-Date Variables for Hib, National Immunization Survey, 2009-2013

Name	Description	Up-To-Date Criteria
P_UTDHIB	Historical UTD flag for Hib.	3+ of any type (07,43,44,D3,HG,HI,HM,HS)
P_UTDHIB_SHORT_S	UTD flag for Hib-shortage (i.e., primary series) recommendation, accounting for manufacturer. New starting 2009.	3+ of any type (07,43,44,D3,HG,HI,HM,HS) OR 2+ Merck types (HM,43)
P_UTDHIB_ROUT_S	UTD flag for routine (i.e., full series) Hib recommendation, accounting for manufacturer. New starting 2009.	4+ of any type (07,43,44,D3,HG,HI,HM,HS) OR 2 Merck types (HM,43) followed by 1 of any type (07,43,44,D3,HG,HI,HM,HS)

Table 9: Up-To-Date Variables for Vaccine Series Including Hib, National Immunization Survey, 2009-2013

Name	Description
PUTD4313	UTD flag for the 4:3:1:3 series using the 3+ any type UTD definition for HIB
P_UTD431H_ROUT_S	UTD flag for the 4:3:1:3* series using the routine (i.e., full series) UTD definition for HIB
PUT43133	UTD flag for the 4:3:1:3:3 series using the 3+ any type UTD definition for HIB
P_UTD431H3_ROUT_S	UTD flag for the 4:3:1:3*:3 series using the routine (i.e., full series) UTD definition for HIB
PU431331	UTD flag for the 4:3:1:3:3:1 series using the 3+ any type UTD definition for HIB
P_UTD431H31_ROUT_S	UTD flag for the 4:3:1:3*:3:1 series using the routine (i.e., full series) UTD definition for HIB
PU4313313	UTD flag for the 4:3:1:3:3:1:3 series using the 3+ any type UTD definition for HIB
P_UTD431H313_ROUT_S	UTD flag for the 4:3:1:3*:3:1:3 series using the routine (i.e., full series) UTD definition for HIB
PU4313314	UTD flag for the 4:3:1:3:3:1:4 series using the 3+ any type UTD definition for HIB
P_UTD431H314_ROUT_S	UTD flag for the 4:3:1:3*:3:1:4 series using the routine (i.e., full series) UTD definition for HIB

7.8.3. Rotavirus Up-To-Date Variables

The up-to-date status for Rotavirus vaccine depends on the manufacturer of the vaccines received; the requirement is two or more doses of Rotarix® (GSK) or three or more doses of Rotavirus vaccine of any type. Beginning with the 2009 NIS public-use data file, an up-to-date variable for Rotavirus vaccine (P_UTDROT_S) was added to indicate up-to-date status, accounting for the manufacturer (3+ Rotavirus doses of any type or 2+ Rotarix® doses).

Note that for this Rotavirus up-to-date variable, if the manufacturer is unknown because the provider failed to check a type box on the IHQ, it has been assumed that the Rotavirus vaccine dose is not Rotarix®; that is, this variable is based on a "strict" treatment of Rotavirus vaccinations of unknown type, erring on the side of classifying the child as not up-to-date.

7.9. Section 9: Provider-Reported Age-At-Vaccination Variables

This section contains variables storing the child's age in days and months at each vaccination in the synthesized provider-reported vaccination history, along with the vaccine types of those vaccinations.

For each vaccine category, variables named **D*YYY*1 - D*YYY*9** and ***YYY*_AGE1 - *YYY*_AGE9** store the age in days and months, respectively, of the child when the vaccination was administered for up to nine vaccinations in the child's synthesized provider-reported vaccination history, where "YYY" is the vaccine category abbreviation given in Table 6. For vaccine categories that contain multiple vaccine types, variables **X*YYY*TY1 - X*YYY*TY9** give the corresponding vaccine type code (see Table 6).

Unlike the vaccination count and up-to-date variables in Section 8 of the public-use data file, the variables in Section 9 include vaccinations given both before and after the household interview was completed. If desired, users can limit the Section 9 variables to only those before the household interview date by examining the corresponding Section 8 "P_NUM" variable and limiting the analysis of the Section 9 variables to only the first *n* variables, where *n* is equal to the number of vaccinations in the vaccine category before the household interview date as indicated by the corresponding "P_NUM" variable.

Users of the NIS Public-use File should be aware that the age-at-vaccination variables included in Section 9 may contain a small number of vaccination ages that are implausible according to the recommended immunization schedules (http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html). Such ages may arise if a medical provider inadvertently records an erroneous vaccination date or if a vaccination date is incorrectly transcribed onto an IHQ. The quality control procedures of the NIS address implausible ages to every extent possible. Suspicious dates are manually reviewed and corrected if there is evidence either from the household interview or from another provider that the date is incorrect. In rare cases, however, when there is no further information with which to correct the reported vaccination date, the vaccination is treated as having actually occurred and the implausible age at vaccination persists on the data file. The data user should consider these issues in deciding how to analyze the NIS data.

7.10. Section 10: Health Insurance Module Variables

The Health Insurance Module (HIM) was introduced in 2006 to gather information on the health insurance coverage of the child. HIM data were included in the NIS public-use data file for the first time in 2007. The NIS public-use file contains seven variables as follows:

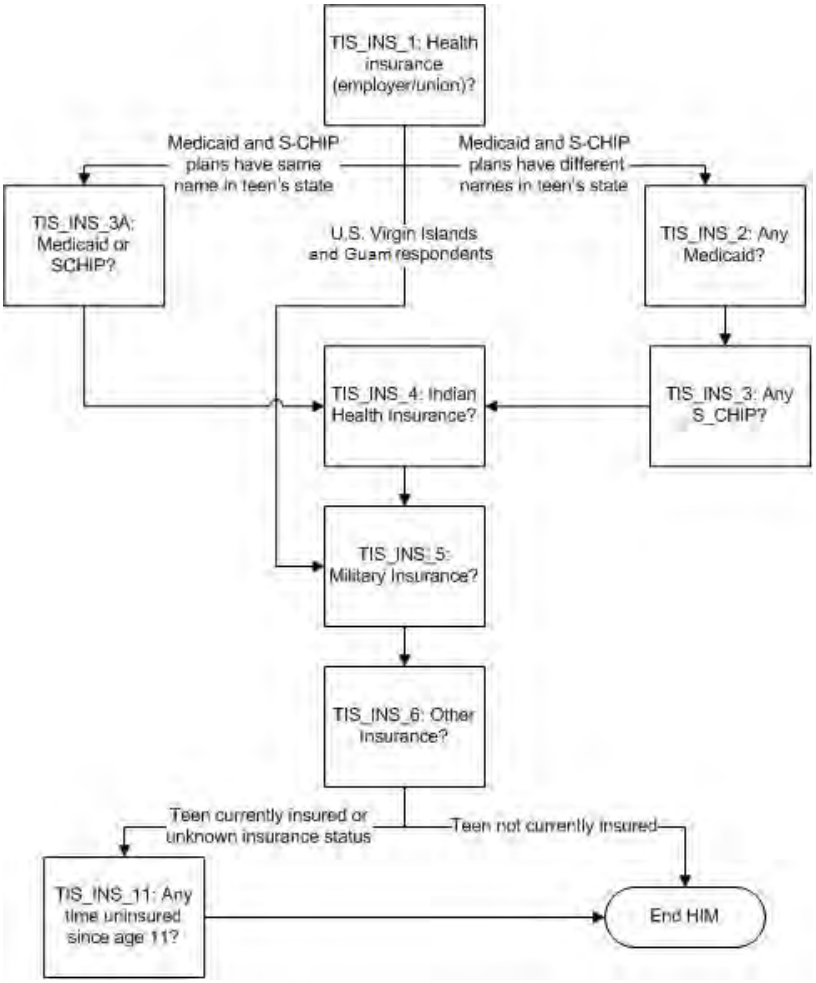
- **INS_1** – "Is child covered by health insurance provided through employer or union?";
- **INS_2** – "Is child covered by any MEDICAID plan?";
- **INS_3** – "Is child covered by S-CHIP?";
- **INS_3A** – "Is child covered by any MEDICAID plan or S-CHIP?";
- **INS_4_5 –** "Is the child covered by Indian Health Service, Military Health Care, TRICARE, CHAMPUS, or CHAMP-VA?";
- **INS_6** – "Is child covered by any other health insurance or health care plan?"; and
- **INS_11** - "Anytime when child was not covered by health insurance?"

Note that INS_4_5 combines the responses at questions INS_4 and INS_5. Each variable has "Yes", "No", "Don't Know", and "Refused" as response options. Also, users will encounter blanks or missing values in each variable. There are several reasons for the missingness. First, in order to reach the HIM section, the respondent must first finish Section D. Since the NIS public-use data file contains records for all respondents completing Section C, and because some of these Section C respondents did not complete Section D, some records are for respondents who did not reach the HIM. Second, there is a possibility that the respondent began the HIM but broke off the interview before finishing. Finally, there are skip patterns in the module. That is, depending on the respondent's answers to previous questions, certain questions may be skipped. Figure 1 illustrates the flow of questions for the eight variables included in the NIS public-use data file.

The first question (INS_1) was asked of all respondents who reached the HIM. If the name of the Medicaid and S-CHIP programs were the same in the child's state, the respondent skipped to INS_3A; if the names of the Medicaid and S-CHIP programs were different in the child's state, the respondent was instead asked questions INS_2 and INS_3. (Note that U.S. Virgin Islands and Guam respondents were not asked about Medicaid and S-CHIP; such cases skipped INS_2, INS_3, and INS_3A.) Questions INS_4, INS_5, and INS_6 were asked of all U.S. proper HIM respondents. (U.S. Virgin Islands and Guam respondents were not asked about Indian Health Insurance at INS_4.) Based on the respondent's answers to previous HIM questions (some of which are not included in the public-use file), if it was determined that the child currently had health insurance or if the child's insurance status was unknown, the respondent was asked if the child was ever uninsured at question INS_11.

Prior to the 2012 CLAF, the variable VFC_I indicated VFC-eligibility. The variable VFC_I was dropped from the PUF beginning 2012 due to changes to Page 1 of the NIS-Teen IHQ. Entitlement to the Vaccines for Children (VFC) program is determined by a number of factors. A child is entitled if 1) the child is covered by Medicaid, 2) the child is uninsured, 3) the child is of American Indian or Alaska Native race, or 4) the child is underinsured and has received vaccinations from a Federally Qualified Health Center (FQHC). The first three criteria were unaffected by the change to Page 1 of the IHQ. For the fourth criterion, the approach for ascertaining if a provider was a FQHC was changed on the IHQ in 2012. While CDC evaluates the accuracy of the provider-reported FQHC status, the VFC_I variable remains dropped from the PUF. Medicaid and uninsured components of VFC entitlement can be analyzed using other health insurance module variables.

Figure 1: Question Flow for the Eight Health Insurance Variables included in the Public-use File



8. Analytic and Reporting Guidelines

Data from the NIS public-use data file can be used to produce national, state, and estimation area estimates of vaccination coverage using the PROVWT_D weight (PROVWTVIGU_D if U.S. Virgin Islands and Guam are to be included) for dual-frame estimates.

Information in the data file can also be used to calculate standard errors of the vaccination coverage estimates that reflect the complex sample design of the NIS. The sample is stratified by the two sample frames and the 59 estimation areas. **Use STRATUM as the stratum variable for variance estimation.** This stratum identifier and the coded household identifier (SEQNUMHH) are key variables for obtaining standard errors for estimation area, state, and national estimates of vaccination coverage rates. The estimation area variable ESTIAP13 defines mutually exclusive and exhaustive geographic areas, while STRATUM is a combination of the estimation area variable for that year and the sampling frame (landline or cell-phone).

Demographic and socioeconomic variables in the file can be used to obtain national vaccination coverage estimates for sub-groups of the population. Data users should, however, be aware that estimates for such sub-groups at the state or estimation area level will generally have large standard errors because of small sample sizes. The NCHS standard for precision of sub-group estimates is that the ratio of the standard error to the estimate should be less than or equal to 0.3, and each analytic cell should contain at least 30 respondents.

8.1. Use of NIS Sampling Weights

The NIS public-use data file contains two sets of child level weights. **The RDD-phase weights are RDDWT_D/RDDWTVIGU_D and stratum variable is STRATUM.**

The weight variables that apply to children with adequate provider data are PROVWT_D/PROVWTVIGU_D with stratum variable STRATUM. These weights should be used

to form estimates of vaccination coverage. Each child with adequate provider data (PDAT = 1) has a positive value for PROVWT_D/PROVWTVIGU_D. Starting with the 2002 file, the definition of children with adequate provider data was expanded to include unvaccinated children (as discussed in Section 2). Table 10 presents a summary of the appropriate weights and stratum variables to use for various types of analyses.

Table 10: Summary of Weights and Stratum Variables, National Immunization Survey PUF, 2013

Weight Variable	Population[1]	Sample Frame	Strata	Stratum Variable
RDDWTVIGU_D	U.S. including USVI and Guam	Dual Frame	Sample Type by Estimation Area	STRATUM
RDDWT_D	U.S. proper	Dual Frame	Sample Type by Estimation Area	STRATUM
PROVWTVIGU_D	U.S. including USVI and Guam, with adequate provider data	Dual Frame	Sample Type by Estimation Area	STRATUM
PROVWT_D	U.S. proper, with adequate provider data	Dual Frame	Sample Type by Estimation Area	STRATUM

[1] Each weight will contain a missing value for all records that are not included in the population covered by the weight.

The NIS public-use data file does not contain any provider-level weights. The NIS does not sample providers directly; rather, they are included in the survey through the children they vaccinate. A user of the file should not attempt provider-level analyses (e.g., estimate the percentage of providers in the U.S. that are private providers), because the NIS sample was not designed for that purpose.

8.2. Estimation and Analysis

8.2.1. Estimating Vaccination Coverage Rates

Vaccination coverage rates are ratio estimators, as described in the statistical literature on methods for complex sample surveys. Because of the adjustment to the sampling weights for provider-phase non-

response, statistical analyses require only data from children with adequate provider data (PDAT = 1), along with their final provider sampling weights (PROVWT_D/PROVWTVIGU_D). To summarize the statistical methodology by which vaccination coverage rates and their standard errors are obtained from these data, let Y_{hij} be an indicator, for the *j*th child with adequate provider data in the *i*th sampled household in the *h*th stratum of the NIS sampling design, equal to 1 if the child is up-to-date according to the provider data and 0 otherwise. Also, let W_{hij} denote the value of PROVWT_D/PROVWTVIGU_D for this child. Then, letting $\hat{Y}_h = \sum_{i=1}^{n_h} \sum_{j=1}^{m_{hi}} W_{hij} Y_{hij}$ and $\hat{T}_h = \sum_{i=1}^{n_h} \sum_{j=1}^{m_{hi}} W_{hij}$, the national estimator of the vaccination coverage rate may be expressed as

$$\hat{\theta} = \frac{\sum_{h=1}^{L} \hat{Y}_h}{\sum_{h=1}^{L} \hat{T}_h}$$

where *L* denotes the number of strata, n_h denotes the number of sampled households containing children with adequate provider data in the *h*th stratum, and m_{hi} denotes the number of age-eligible children with adequate provider data in the *i*th household in the *h*th stratum.

Letting *L* instead denote the number of strata in a state, the above formula can also be used to calculate vaccination coverage rates for states (regardless of whether the state contains only one or more than one strata).

8.2.2. Estimating Standard Errors of Vaccination Coverage Rates

The Taylor-series method can be used to estimate the sampling variance of vaccination coverage rates for the U.S., the states, and estimation areas. Letting $Z_{hij} = \frac{W_{hij}(Y_{hij} - \hat{\theta})}{\sum_{h=1}^{L} \hat{T}_h}$, $Z_{hi} = \sum_{j=1}^{m_{hi}} Z_{hij}$, and $\overline{Z}_h = \frac{\sum_{i=1}^{n_h} Z_{hi}}{n_h}$

yields an estimator of the variance of the estimated vaccination coverage rate, $\hat{\theta}$, equal to

$$v(\hat{\theta}) = \sum_{h=1}^{L} \frac{n_h}{n_h - 1} \sum_{i=1}^{n_h} (Z_{hi} - \overline{Z}_h)^2 .$$

The standard error is the square root of the variance. The estimation of standard errors for estimates of vaccination coverage rates in the NIS can be implemented in specialized statistical software such as SUDAAN (Research Triangle Institute 2008), SAS (SAS Institute Inc. 2003), R (Lumley, 2010), and Stata (Stata Corporation 2009). Appendix D gives several examples of the use of SAS, R, and SUDAAN to estimate vaccination coverage rates and their standard errors for estimation areas and states. For all procedures, the option of with-replacement sampling of primary sampling units within stratum is used, because the sampling fractions for households within an estimation area are all quite small. **For all estimates, the variable STRATUM is used as the stratum variable and the household identifier (SEQNUMHH) is used as the primary sampling unit identifier.** The data file should be sorted first on STRATUM and then on SEQNUMHH before running the programs for SUDAAN and SAS.

8.3. Combining Multiple Years of NIS Data

8.3.1. Estimation of Multi-Year Means

With release of the 2013 NIS public-use data file, nineteen years of NIS data are now available. The precision of estimates of vaccination coverage for sub-domains (e.g., by race/ethnicity of child) within estimation areas or states can be improved by combining two or more years of NIS data. Data users

should, however, be aware that estimates from combined years of NIS data represent an average over two or more years. Although combining several years of NIS data will yield a larger sample size for estimation areas and states, the composition of the population in a geographic area may change over time, making interpretation of the results difficult. Furthermore, if vaccination administration schedules or vaccination coverage changes over time, the estimate of vaccination coverage for the combined time period applies to a hypothetical population that existed at the middle of the time period, making interpretation of the results even more difficult. Given the use of independent RDD samples in the NIS, it is also possible that a child could appear in more than one public-use data file.

To estimate a multi-year mean for a given NIS variable, the weights in each participating file (RDD-phase weights HY_WGT in 1995-2001, RDD_WT in 2002, WGT_RDD in 2003-2004, RDDWT in 2005-2010, RDDWT_D/RDDWT_LL in 2011, RDDWT_D/RDDWTVI_D in 2012, **and RDDWT_D/RDDWTVIGU_D in 2013**; and provider-phase weights W0 in 1995-2001, WT in 2002, WGT in 2003-2004, PROVWT in 2005-2010, PROVWT_D/PROVWT_LL in 2011, PROVWT_D/PROVWTVI_D in 2012, and **PROVWT_D/PROVWTVIGU_D in 2013** should be divided by the number of years being combined. For example, if data for 2011, 2012, and 2013 for children with adequate provider data are to be combined, then the weights in the three files – **PROVWT_D/PROVWT_LL in 2011 and PROVWT_D in 2012-2013** – should be divided by 3 to obtain revised weights, which should be saved as a new variable, say NEWWT. It is necessary to use NEWWT in the analysis to obtain correct weighted estimates for children ages 19 to 35 months. Furthermore, the child and household ID numbers (SEQNUMC and SEQNUMHH) in the files are unique only within a year, not across years. It is important for the user to create revised, unique ID numbers when combining data from multiple years.

The following SAS code can be used:

```
YRSEQC = 1 * (YEAR || SEQNUMC);
```

YRSEQHH = 1 * (YEAR || SEQNUMHH);

YEAR is the 4-digit year variable for the NIS data year (e.g., 2010).

To produce valid estimates of sampling variability and valid confidence intervals for multi-year coverage rates and other multi-year means, it is necessary to use specialized software such as SAS or SUDAAN.

The years 2005 to 2013 bring an important new complication for variance estimation not encountered in previous NIS years, because some traditional estimation areas were removed and other new areas were defined and introduced to the survey (see Section 2 above for more information about rotating estimation areas). **The variance strata for 2004 and all prior years are defined by the variable ITRUEIAP, while the variance strata for 2005-2013 are defined by the variables ESTIAP, ESTIAP06, ESTIAP07, ESTIAP08, ESTIAP09, ESTIAP10, STRATUM_D/ESTIAP11, STRATUM, and STRATUM, respectively, with STRATUM_D and STRATUM being a combination of the estimation area variable for that year and the sampling frame (landline or cell-phone).** The estimation area variables ITRUEIAP, ESTIAP, ESTIAP06, ESTIAP07, ESTIAP08, ESTIAP09, ESTIAP10, ESTIAP11, ESTIAP12, and ESTIAP13 define mutually exclusive and exhaustive geographic areas. However, they are not exactly the same areas. For example, Boston and Rest of Massachusetts are each estimation areas in 2006, 2004 and all prior years, while statewide Massachusetts is an estimation area in 2005 and 2007-2013. Other areas, such as New York City and Rest of New York, are estimation areas in all years, including 2005-2013.

To make inferences concerning multi-year means, the user must take two actions. First, he/she must define and save a new stratum variable with a common name for all years included in the analysis. Second, he/she must define a common set of estimation domains that can be supported by each of the files included in the multi-year analysis. To take these actions, the user should follow the following seven-step procedure (or its equivalent):

i. Compute and save the new, common variance-stratum variable for each year participating in the analysis. The variable should be defined by the equation

STRATUMV = ITRUEIAP, for children in the 2004 or prior years' public-use data files

= ESTIAP, for children in the 2005 public-use data file

= ESTIAP06, for children in the 2006 public-use data file

= ESTIAP07, for children in the 2007 public-use data file

= ESTIAP08, for children in the 2008 public-use data file

= ESTIAP09, for children in the 2009 public-use data file

= ESTIAP10, for children in the 2010 public-use data file

= STRATUM_D if using PROVWT_D or

ESTIAP11 if using PROVWT_LL, for children in the 2011 public-use data file

= STRATUM, for children in the 2012 and 2013 public-use data files

ii. Compute and save the new, common weight variable, NEWWT, as instructed above for each year participating in the analysis.

iii. Compute and save the new, unique child and household identification numbers, YRSEQC and YRSEQHH, as instructed above for each year participating in the analysis.

iv. Compute and save a variable defining the common estimation domains to be studied for each year participating in the analysis. For example, one could use the LCDIAP (Least Common Denominator Estimation Area) variable set forth in Table 11 or states as geographic domains.

v. Merge the multiple files into one consolidated file in a format compatible with the specialized software to be used.

vi. Sort the consolidated file by YEAR, STRATUMV, and YRSEQHH.

vii. Run the specialized software on the consolidated file, computing estimates, variance estimates, and confidence intervals. For SUDAAN users, sampling levels or stages may be specified by the statement

NEST YEAR STRATUMV YRSEQHH / PSULEV = 3;

the specification of weights by

WEIGHT NEWWT;

and the specification of estimation domains, for example, by the two statements

```
CLASS YEAR LCDIAP STATE;
TABLES LCDIAP;
```

or

```
CLASS YEAR LCDIAP STATE;
TABLES STATE;
```

8.3.2. Estimation of Multi-Year Contrasts

Considerations similar to those for multi-year means arise in the estimation of contrasts between NIS years. For example, a typical contrast of interest would be the difference between the immunization coverage parameters in 2012 and in 2013.

To make inferences concerning a multi-year contrast, the user will need to work with the original weights reported on the files and store them in a common variable. One must not divide the original weights by the number of years included in the contrast. For example, one may define the new, common weight variable as

NEWWT2 = **PROVWT_D/PROVWT_LL** , if the child is in the 2011 PUF.

= **PROVWT_D** , if the child is in the 2012 or 2013 PUF.

The user should follow the seven-step procedure set forth in the section on multi-year means, using NEWWT2 in lieu of NEWWT. In SUDAAN, the user should also specify the contrast of interest through use of a CONTRAST statement or an appropriate regression model. For example, to compare the 4:3:1:3:3:1 up-to-date estimate from 2011 to the 2012 estimate, SUDAAN users can use the following WEIGHT, VAR, and CONTRAST statements:

```
WEIGHT NEWWT2;
VAR PU431331;
CONTRAST YEAR = (-1 1);
```

Table 11: Cross-Walk Between ITRUEIAP, ESTIAP, ESTIAP06-ESTIAP13, and Least Common Denominator Estimation Area (LCDIAP), National Immunization Survey, 2013

LCDIAP	Area Name	ITRUEIAP (1995-2004)	ESTIAP (2005)	ESTIAP06 (2006)	ESTIAP07 (2007)	ESTIAP08 (2008)	ESTIAP09 (2009)	ESTIAP10 (2010)	ESTIAP11 (2011)	ESTIAP12 (2012)	ESTIAPT13 (2013)
	Alabama										
20	AL-Jefferson County	21	21	20	20	20	20	20	20	20	20
20	AL-Rest of State	20	20	20	20	20	20	20	20	20	20
74	Alaska	74	74	74	74	74	74	74	74	74	74
	Arizona										
66	AZ-Maricopa County	67	67	67	66	66	66	66	66	66	66
66	AZ-Rest of State	66	66	66	66	66	66	66	66	66	66
46	Arkansas	46	46	46	46	46	46	46	46	46	46
	California										
68	CA-Fresno County	68	68	84	68	68	68	68	68	68	68
68	CA-Los Angeles County	69	69	69	69	69	69	69	68	68	68
68	CA-Northern CA	68	68	85	68	85	68	68	68	68	68
68	CA-San Diego County	71	68	71	68	68	68	68	68	68	68
68	CA-Santa Clara County	70	68	70	68	70	68	68	68	68	68
68	CA-San Bernardino County	68	80	68	80	68	68	68	68	68	68
68	CA-Alameda County	68	79	68	79	68	68	68	68	68	68
68	CA-Rest of State	68	68	68	68	68	68	68	68	68	68
	Colorado										
60	CO-Denver	60	81	60	60	60	60	60	60	60	60
60	CO-Rest of State	60	60	60	60	60	60	60	60	60	60
1	Connecticut	1	1	1	1	1	1	1	1	1	1
13	Delaware	13	13	13	13	13	13	13	13	13	13
12	District of Columbia	12	12	12	12	12	12	12	12	12	12
	Florida										
22	FL-Miami-Dade County	24	22	24	24	24	22	22	22	22	22
22	FL-Duval County	23	23	23	22	22	22	22	22	22	22
22	FL-Orange County	22	22	22	22	91	22	22	22	22	22

LCDIAP	Area Name	ITRUEIAP (1995-2004)	ESTIAP (2005)	ESTIAP06 (2006)	ESTIAP07 (2007)	ESTIAP08 (2008)	ESTIAP09 (2009)	ESTIAP10 (2010)	ESTIAP11 (2011)	ESTIAP12 (2012)	ESTIAPT13 (2013)
22	FL-Rest of State	22	22	22	22	22	22	22	22	22	22
	Georgia										
25	GA-Fulton/DeKalb Counties	26	26	26	25	25	25	25	25	25	25
25	GA-Rest of State	25	25	25	25	25	25	25	25	25	25
72	Hawaii	72	72	72	72	72	72	72	72	72	72
75	Idaho	75	75	75	75	75	75	75	75	75	75
	Illinois										
35	IL-City of Chicago	35	35	35	35	35	35	35	35	35	35
34	IL-Madison and St. Clair Counties	34	34	34	34	92	34	34	34	34	34
34	IL-Rest of State	34	34	34	34	34	34	34	34	34	34
	Indiana										
36	IN-Lake County	36	36	36	36	36	96	36	36	36	36
36	IN-Marion County	37	36	37	37	36	37	36	36	36	36
36	IN-Rest of State	36	36	36	36	36	36	36	36	36	36
56	Iowa	56	56	56	56	56	56	56	56	56	56
	Kansas										
57	KS-Eastern KS	57	57	86	57	57	57	57	57	57	57
57	KS-Rest of State	57	57	57	57	57	57	57	57	57	57
27	Kentucky	27	27	27	27	27	27	27	27	27	27
	Louisiana										
47	LA-Orleans Parish	48	47	47	47	47	47	47	47	47	47
47	LA-Rest of State	47	47	47	47	47	47	47	47	47	47
4	Maine	4	4	4	4	4	4	4	4	4	4
	Maryland										
14	MD-City of Baltimore	15	15	15	14	15	15	14	14	14	14
14	MD-Prince George's County	14	14	14	14	14	14	14	103	14	14
14	MD-Rest of State	14	14	14	14	14	14	14	14	14	14
	Massachusetts										
2	MA-City of Boston	3	2	3	2	2	2	2	2	2	2

LCDIAP	Area Name	ITRUEIAP (1995-2004)	ESTIAP (2005)	ESTIAP06 (2006)	ESTIAP07 (2007)	ESTIAP08 (2008)	ESTIAP09 (2009)	ESTIAP10 (2010)	ESTIAP11 (2011)	ESTIAP12 (2012)	ESTIAPT13 (2013)
2	MA-Rest of State	2	2	2	2	2	2	2	2	2	2
	Michigan										
38	MI-City of Detroit	39	39	39	38	38	38	38	38	38	38
38	MI-Rest of State	38	38	38	38	38	38	38	38	38	38
	Minnesota										
40	MN-Twin Cities	40	40	40	40	93	40	40	40	40	40
40	MN-Rest of State	40	40	40	40	40	40	40	40	40	40
28	Mississippi	28	28	28	28	28	28	28	28	28	28
	Missouri										
58	MO-St. Louis County/City	58	82	58	58	58	58	58	58	58	58
58	MO-Rest of State	58	58	58	58	58	58	58	58	58	58
61	Montana	61	61	61	61	61	61	61	61	61	61
59	Nebraska	59	59	59	59	59	59	59	59	59	59
	Nevada										
73	NV-Clark County	73	83	73	73	73	73	73	73	73	73
73	NV-Rest of State	73	73	73	73	73	73	73	73	73	73
5	New Hampshire	5	5	5	5	5	5	5	5	5	5
	New Jersey										
8	NJ-City of Newark	9	9	9	8	8	8	8	8	8	8
8	NJ-Rest of State	8	8	8	8	8	8	8	8	8	8
	New Mexico										
49	NM-Southern NM	49	49	88	49	49	49	49	49	49	49
49	NM-Rest of State	49	49	49	49	49	49	49	49	49	49
	New York										
11	NY-City of New York	11	11	11	11	11	11	11	11	11	11
10	NY-Rest of State	10	10	10	10	10	10	10	10	10	10
29	North Carolina	29	29	29	29	29	29	29	29	29	29
62	North Dakota	62	62	62	62	62	62	62	62	62	62
	Ohio										
41	OH-Cuyahoga County	42	42	42	41	41	41	41	41	41	41
41	OH-Franklin County	43	43	41	41	41	41	41	41	41	41

LCDIAP	Area Name	ITRUEIAP (1995-2004)	ESTIAP (2005)	ESTIAP06 (2006)	ESTIAP07 (2007)	ESTIAP08 (2008)	ESTIAP09 (2009)	ESTIAP10 (2010)	ESTIAP11 (2011)	ESTIAP12 (2012)	ESTIAPT13 (2013)
41	OH-Rest of State	41	41	41	41	41	41	41	41	41	41
50	Oklahoma	50	50	50	50	50	50	50	50	50	50
76	Oregon	76	76	76	76	76	76	76	76	76	76
	Pennsylvania										
16	PA-Allegheny County	16	16	87	16	16	16	16	16	16	16
17	PA-Philadelphia County	17	17	17	17	17	17	17	17	17	17
16	PA-Rest of State	16	16	16	16	16	16	16	16	16	16
6	Rhode Island	6	6	6	6	6	6	6	6	6	6
30	South Carolina	30	30	30	30	30	30	30	30	30	30
63	South Dakota	63	63	63	63	63	63	63	63	63	63
	Tennessee										
31	TN-Davidson County	33	33	31	31	31	31	31	31	31	31
31	TN-Shelby County	32	32	32	31	31	31	31	31	31	31
31	TN-Rest of State	31	31	31	31	31	31	31	31	31	31
	Texas										
55	TX-Bexar County	55	55	55	55	55	55	55	55	55	55
54	TX-City of Houston	54	54	54	54	54	54	54	54	54	54
51	TX-Dallas County	52	52	52	52	52	52	52	52	52	51
53	TX-El Paso County	53	53	53	53	53	53	53	53	53	53
51	TX-Rest of State	51	51	51	51	51	51	51	51	51	51
64	Utah	64	64	64	64	64	64	64	64	64	64
7	Vermont	7	7	7	7	7	7	7	7	7	7
18	Virginia	18	18	18	18	18	18	18	18	18	18
	Washington[1]										
77	WA-Eastern WA	77	77	771	77	774	774	97	77	77	77
77	WA-Western WA	77	77	77	773	774	774	102	77	77	77
77	WA-King County	78	78	78	77	77	77	102	77	77	77
77	WA-Rest of State	77	77	772	77	77	77	-	77	77	77
19	West Virginia	19	19	19	19	19	19	19	19	19	19
	Wisconsin										
44	WI-Milwaukee County	45	45	45	44	44	44	44	44	44	44

LCDIAP	Area Name	ITRUEIAP (1995-2004)	ESTIAP (2005)	ESTIAP06 (2006)	ESTIAP07 (2007)	ESTIAP08 (2008)	ESTIAP09 (2009)	ESTIAP10 (2010)	ESTIAP11 (2011)	ESTIAP12 (2012)	ESTIAPT13 (2013)
44	WI-Rest of State	44	44	44	44	44	44	44	44	44	44
65	Wyoming	65	65	65	65	65	65	65	65	65	65
-	U.S. Virgin Islands	-	-	-	-	-	95	95	95	95	95
-	Guam	-	-	-	-	-	-	-	-	-	105

[1] The estimation area WA-Eastern WA was introduced in 2006, and while this estimation area also existed in 2010, the county definition of the area changed, making cross-year comparisons inadvisable. The estimation area WA-Western WA, introduced in 2007, presents the same issue. The counties included in the area changed (e.g., in 2010 it included King County). Analysis of Washington state data across years should use the entire state as the "Least Common Denominator".

9. Summary Tables

Appendix F contains seven tables. Appendix Table F.1 lists the 59 estimation areas for the 2013 NIS by state. For the U.S. and for each state and estimation area, it provides the estimated population total of children ages 19 to 35 months of age in 2013, and (from 2013 NIS data collection) number of children with completed household interviews and number of children with adequate provider data.

Appendix Tables F.2 through F.5 summarize pairs of variables: age group of child by maternal education (Appendix Table F.2), age group by family poverty status (Appendix Table F.3), race/ethnicity by family poverty status (Appendix Table F.4), age group by race/ethnicity (Appendix Table F.5), and age group by gender (Appendix Table F.6). Each of these tables gives the unweighted and weighted counts of children who have completed household interviews and the unweighted and weighted counts of children with adequate provider data.

Appendix Table F.7 presents estimates of vaccination coverage and symmetric 95-percent confidence intervals obtained from SUDAAN. The data user should obtain the same estimates from the 2013 public-use data file.

Appendix G contains two tables and two time-series charts. Table G.1 and Figure G.1 show key components of the NIS response rates and the overall CASRO response rates for the landline sample by year of the survey. Table G.2 and Figure G.2 show key components of the NIS response rates and the overall CASRO response rates for the cell sample by year of the survey. Table G.3 and Figure G.3 show vaccination coverage estimates since 1995.

10. Limitations

The findings in this report are subject to at least four limitations. First, because NIS is a telephone survey, results are weighted to be representative of all children aged 19 to 35 months. Although statistical adjustments were made to account for nonresponse and households without telephones, some bias might remain. Second, underestimates of vaccination coverage might have resulted from the exclusive use of provider-reported vaccination histories because completeness of these records is unknown. Third, although national estimates of vaccination coverage are precise, estimates for state and local areas should be interpreted with caution because their sample sizes are smaller and their confidence intervals generally are wider than those for national estimates. Finally, analysis of trends across data years that span 2010 and earlier with 2011, 2012, and 2013 or all three of 2011, 2012, and 2013 are subject to potential bias that may remain after weighting adjustments because of the switch from landline to dual landline and cell phone frames in 2011, and expansion of the share of the 2012 and 2013 samples from the cell phone frame compared to 2011.

11. Citations for NIS Data

In publications please acknowledge the original data source. The citation for the 2013 NIS public-use data file is:

U.S. Department of Health and Human Services (DHHS). National Center for Health Statistics. The 2013 National Immunization Survey, Hyattsville, MD: Centers for Disease Control and Prevention, 2014.

Information about the NIS is located at http://www.cdc.gov/nchs/nis.htm

The NIS public-use data file is located at http://www.cdc.gov/nchs/nis/data_files.htm.

Please place the acronym "NIS" in the titles, keywords, or abstracts of journal articles and other publications in order to facilitate retrieval of such materials in bibliographic searches.

The following publications use NIS data from 2010 or later:

2014

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Appendix A: Glossary of Abbreviations and Terms

3:3:1	The series of 3 or more DTaP vaccinations, 3 or more polio vaccinations, and 1 or more MCV vaccinations
4:3:1	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, and 1 or more MCV vaccinations
4:3:1:3	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, and 3 or more Hib vaccinations of any type
4:3:1:H (routine Hib)	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, and 3 or 4 Hib vaccinations depending on manufacturer (routine recommendation)
4:3:1:3:3	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or more Hib vaccinations of any type, and 3 or more hepatitis B vaccinations
4:3:1:H:3 (routine Hib)	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or 4 Hib vaccinations depending on manufacturer (routine recommendation), and 3 or more hepatitis B vaccinations
4:3:1:3:3:1	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or more Hib vaccinations of any type, 3 or more hepatitis B vaccinations, and 1 or more varicella vaccinations given at age 12 months or older
4:3:1:H:3:1 (routine Hib)	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or 4 Hib vaccinations depending on manufacturer (routine recommendation), 3 or more hepatitis B vaccinations, and 1 or more varicella vaccinations given at age 12 months or older
4:3:1:3:3:1:3	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or more Hib vaccinations of any type, 3 or more hepatitis B vaccinations, 1 or more varicella vaccinations given at age 12 months or older, and 3 or more pneumococcal vaccinations
4:3:1:H:3:1:3 (routine Hib)	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or 4 Hib vaccinations depending on manufacturer (routine recommendation), 3 or more hepatitis B vaccinations, 1 or more varicella vaccinations given at age 12 months or older, and 3 or more pneumococcal vaccinations
4:3:1:3:3:1:4	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or more MCV vaccinations, 3 or more Hib vaccinations of any type, 3 or more hepatitis B vaccinations, 1 or more varicella vaccinations given at age 12 months or older, and 4 or more pneumococcal vaccinations
4:3:1:H:3:1:4	The series of 4 or more DTaP vaccinations, 3 or more polio vaccinations, 1 or

(routine Hib)	more MCV vaccinations, 3 or 4 Hib vaccinations depending on manufacturer (routine recommendation), 3 or more hepatitis B vaccinations, 1 or more varicella vaccinations given at age 12 months or older, and 4 or more pneumococcal vaccinations
CATI	Computer-assisted telephone interviewing
CDC	Centers for Disease Control and Prevention
CII	Childhood Immunization Initiative
DOB	Date of birth
DTaP	Diphtheria and tetanus toxoids and acellular pertussis
DTP	Diphtheria and tetanus toxoids and pertussis
DT	Diphtheria and tetanus toxoids
FLU	Seasonal influenza
H1N	Monovalent 2009 H1N1 influenza
Hep A	Hepatitis A
Hep B	Hepatitis B
Hib	*Haemophilus influenzae* type b
Hib routine recommendation	Four or more doses of Hib vaccine of any type, or two or more doses of Hib vaccine of Merck types followed by one dose of Hib vaccine of any type
Hib shortage recommendation	Three or more doses of Hib vaccine of any type or two or more doses of Hib vaccine of Merck types
IAP	Immunization Action Plan
IHQ	Immunization history questionnaire
IPV	Inactivated poliovirus vaccine
MCV	Measles-containing vaccine
MMR	Measles, mumps, and rubella
NCHS	National Center for Health Statistics
NCIRD	National Center for Immunization and Respiratory Diseases
NIS	National Immunization Survey

NHIS	National Health Interview Survey
NIP	National Immunization Program
OPV	Oral poliovirus vaccine
PCV	Pneumococcal conjugate vaccine
PRC	Provider Record Check
PUF	Public-use file
RDD	Random digit dialing
ROT	Rotavirus
SC	Shot card
UTD	Up-to-date
VFC	Vaccines for Children
VRC	Varicella

Appendix B: Summary Statistics for Sampling Weights by Sample Frame and Estimation Area

Table B.1: Distribution of Dual-Frame[1] Sampling Weights for Children with Completed Household Interviews, National Immunization Survey, 2013

State/Estimation Area	n	Sum	Minimum	Maximum	Mean	Coefficient of Variation
Total U.S.[2]	22,462	5,724,087.20	1.11	7,280.46	254.83	158.05
Alabama	312	84,627.31	10.22	752.42	271.24	60.31
Alaska	460	13,751.71	6.88	86.79	29.90	66.77
Arizona	441	123,594.17	7.02	880.13	280.26	76.38
Arkansas	319	55,874.37	14.65	550.34	175.15	68.81
California	511	731,917.83	6.90	7,280.46	1,432.32	101.39
Colorado	442	96,604.90	9.26	605.33	218.56	62.13
Connecticut	355	56,041.69	13.83	435.21	157.86	62.25
Delaware	385	16,544.82	6.48	119.97	42.97	55.68
District of Columbia	390	11,695.94	3.37	87.68	29.99	68.29
Florida	388	310,137.76	8.92	2,584.28	799.32	80.51
Georgia	288	191,743.49	6.22	2,610.46	665.78	96.83
Hawaii	402	26,290.62	8.00	190.68	65.40	67.00
Idaho	345	32,070.95	11.51	239.60	92.96	53.84
Illinois	839	229,659.49	6.98	973.46	273.73	69.73
IL-City of Chicago	295	59,237.13	6.98	505.84	200.80	51.28
IL-Rest of State	544	170,422.36	7.77	973.46	313.28	68.48
Indiana	418	120,178.77	27.07	823.82	287.51	53.67
Iowa	333	54,441.47	12.53	481.01	163.49	63.49
Kansas	312	57,726.35	8.35	425.06	185.02	46.76
Kentucky	305	77,267.61	8.99	806.01	253.34	70.23
Louisiana	414	89,447.72	13.94	578.55	216.06	55.09
Maine	334	18,067.56	10.24	144.46	54.09	55.66
Maryland	472	106,838.39	8.19	998.22	226.35	123.57
Massachusetts	406	104,129.99	8.70	704.43	256.48	69.27
Michigan	342	162,940.33	15.86	1,363.31	476.43	60.55
Mississippi	315	100,426.36	9.47	1,028.84	318.81	76.31
Missouri	322	57,194.91	22.56	570.37	177.62	67.76
Minnesota	310	108,466.87	17.62	923.78	349.89	57.04
Montana	325	17,205.06	8.80	135.68	52.94	59.99
Nebraska	356	36,625.85	15.78	273.95	102.88	53.50
Nevada	478	52,402.71	7.57	282.20	109.63	53.27
New Hampshire	346	19,232.44	8.43	149.86	55.59	54.61
New Jersey	474	157,366.63	6.16	1,014.31	332.00	70.01
New Mexico	399	39,404.79	13.93	322.28	98.76	66.06
New York	884	341,427.76	3.70	1,335.88	386.23	61.31
NY-City of New York	480	170,838.27	10.67	1,010.41	355.91	54.97
NY-Rest of State	404	170,589.49	3.70	1,335.88	422.25	64.85

State/Estimation Area	n	Sum	Minimum	Maximum	Mean	Coefficient of Variation
North Carolina	430	177,250.51	3.84	1,407.78	412.21	76.95
North Dakota	502	13,504.17	6.56	66.25	26.90	53.01
Ohio	420	195,908.28	21.43	1,386.76	466.45	61.31
Oklahoma	478	75,704.62	20.27	403.26	158.38	51.53
Oregon	393	65,630.68	39.72	420.64	167.00	54.55
Pennsylvania	1,053	208,694.94	6.59	1,098.59	198.19	106.51
PA-Philadelphia County	506	34,575.72	16.46	205.11	68.33	63.46
PA-Rest of State	547	174,119.22	6.59	1,098.59	318.32	73.02
Rhode Island	360	15,765.92	5.80	130.60	43.79	61.82
South Carolina	350	82,620.33	20.08	694.96	236.06	64.05
South Dakota	290	16,346.46	8.41	145.62	56.37	60.48
Tennessee	392	115,715.18	8.54	849.83	295.19	65.99
Texas	1,705	558,691.04	9.18	2,727.66	327.68	158.22
TX-Bexar County	394	38,417.04	12.30	295.59	97.51	55.82
TX-City of Houston	348	67,751.14	9.18	801.78	194.69	84.04
TX-El Paso County	364	20,869.75	15.59	171.40	57.33	54.65
TX-Rest of State	599	431,653.11	31.64	2,727.66	720.62	98.47
Utah	372	72,942.39	11.44	426.09	196.08	49.19
Vermont	436	8,293.02	5.59	54.61	19.02	56.52
Virginia	495	150,475.83	1.11	1,603.75	303.99	141.87
Washington	340	127,818.33	4.52	1,272.95	375.94	75.86
West Virginia	366	28,465.02	8.45	236.22	77.77	64.66
Wisconsin	341	98,362.50	14.12	778.88	288.45	56.52
Wyoming	317	10,551.38	6.49	97.17	33.29	61.30
U.S. Virgin Islands	397	2,332.30	1.12	19.18	5.87	68.83
Guam	389	4,498.79	1.39	38.15	11.57	73.76

[1] Distribution of RDDWTVIGU_D.

[2] 'Total U.S.' excludes the U.S. Virgin Islands and Guam.

Table B.2: Distribution of Dual-Frame1 Sampling Weights for Children with Adequate Provider Data, National Immunization Survey, 2013

State/Estimation Area	n	Sum	Minimum	Maximum	Mean	Coefficient of Variation
Total U.S.[2]	13,460	5,683,196.41	1.36	11,497.47	422.23	162.73
Alabama	163	83,507.64	12.92	1,490.78	512.32	64.25
Alaska	292	13,543.77	8.15	153.47	46.38	77.71
Arizona	249	122,243.40	15.32	1,562.54	490.94	73.73
Arkansas	187	55,793.53	21.45	945.49	298.36	63.95
California	282	724,800.61	12.96	11,497.47	2,570.21	102.13
Colorado	260	95,191.65	11.57	1,097.05	366.12	70.02
Connecticut	211	55,304.30	29.50	783.04	262.11	71.63
Delaware	242	16,544.82	9.58	202.29	68.37	60.80
District of Columbia	222	11,677.15	4.01	198.44	52.60	91.12
Florida	228	310,137.76	13.43	4,561.22	1,360.25	79.71
Georgia	177	191,388.86	11.39	4,121.44	1,081.29	93.91
Hawaii	242	26,224.12	20.12	312.68	108.36	73.68
Idaho	225	31,443.21	18.11	376.89	139.75	53.38
Illinois	493	229,020.68	7.56	1,661.47	464.54	72.85
IL-City of Chicago	168	59,237.13	7.56	1,090.69	352.60	67.68
IL-Rest of State	325	169,783.55	15.51	1,661.47	522.41	70.26
Indiana	241	119,736.45	40.31	1,405.81	496.83	54.24
Iowa	210	54,066.31	25.37	860.15	257.46	75.94
Kansas	205	57,726.35	19.53	660.39	281.59	47.08
Kentucky	188	76,956.94	33.90	1,326.73	409.35	70.53
Louisiana	224	89,447.72	16.79	997.81	399.32	53.79
Maine	209	18,067.56	18.64	256.39	86.45	58.84
Maryland	287	106,838.39	11.40	1,571.83	372.26	120.12
Massachusetts	240	103,433.48	13.73	1,225.20	430.97	76.02
Michigan	206	157,958.24	155.56	2,078.82	766.79	58.21
Mississippi	192	99,854.37	10.06	1,819.72	520.07	79.93
Missouri	178	56,865.71	39.67	986.85	319.47	66.79
Minnesota	185	107,420.27	22.39	1,555.48	580.65	58.65
Montana	215	16,903.50	14.64	220.21	78.62	68.16
Nebraska	239	36,439.59	38.40	417.11	152.47	50.44
Nevada	296	51,990.47	10.18	513.33	175.64	53.44
New Hampshire	221	18,838.92	14.14	237.61	85.24	52.66
New Jersey	263	156,588.49	22.12	1,941.75	595.39	67.26
New Mexico	250	39,049.10	22.80	528.89	156.20	66.55
New York	468	341,427.76	9.03	2,504.86	729.55	66.70
NY-City of New York	242	170,838.27	25.80	1,993.61	705.94	57.03
NY-Rest of State	226	170,589.49	9.03	2,504.86	754.82	74.54
North Carolina	258	175,986.91	5.39	2,427.61	682.12	78.62
North Dakota	298	13,382.80	12.65	136.91	44.91	58.40
Ohio	248	195,547.97	28.12	2,293.90	788.50	62.81
Oklahoma	296	74,853.84	23.93	672.26	252.88	52.77
Oregon	271	65,173.62	55.82	631.79	240.49	52.76

State/Estimation Area	n	Sum	Minimum	Maximum	Mean	Coefficient of Variation
Pennsylvania	579	207,511.66	29.38	1,837.91	358.40	102.53
PA-Philadelphia County	264	34,357.29	32.88	395.83	130.14	63.75
PA-Rest of State	315	173,154.37	29.38	1,837.91	549.70	73.28
Rhode Island	205	15,709.54	11.01	230.52	76.63	66.68
South Carolina	207	82,620.33	22.71	1,354.11	399.13	76.40
South Dakota	185	16,143.14	13.15	255.71	87.26	63.87
Tennessee	257	115,152.21	15.73	1,307.33	448.06	62.91
Texas	1,036	553,621.38	19.76	4,590.67	534.38	153.05
TX-Bexar County	228	38,417.04	34.28	487.94	168.50	58.76
TX-City of Houston	203	67,721.71	19.76	1,305.07	333.60	89.47
TX-El Paso County	239	20,719.51	20.71	233.59	86.69	51.51
TX-Rest of State	366	426,763.12	55.76	4,590.67	1,166.02	94.06
Utah	241	71,799.87	16.84	787.51	297.92	54.90
Vermont	278	8,264.88	8.81	84.65	29.73	57.65
Virginia	273	149,999.00	1.36	2,956.38	549.45	144.11
Washington	217	125,148.02	11.69	1,873.20	576.72	81.12
West Virginia	211	28,344.08	18.60	452.73	134.33	68.54
Wisconsin	219	97,110.00	32.96	1,281.08	443.42	58.14
Wyoming	191	10,396.04	8.56	170.85	54.43	63.02
U.S. Virgin Islands[3]	197	2,317.84	1.33	37.46	11.77	72.56
Guam	247	4,490.64	2.04	60.08	18.18	76.81

[1] Distribution of PROVWTVIGU_D.
[2] 'Total U.S.' excludes the U.S. Virgin Islands and Guam.

Appendix C: Flags for Inconsistent Values in the Breastfeeding Data

Two different types of inconsistency can arise in breastfeeding data. The first is that the duration of any breastfeeding can exceed the age of the child, and the second is that the age of the child when first fed formula can exceed the age of child. BF_ENDR06 stores the duration of any breastfeeding, and BF_ENDFL06 flags the inconsistency; BF_FORMR08 stores the age of the child when first fed formula, and BF_FORMFL06 flags the inconsistency.

1. **Both BF_ENDR06 and BF_FORMR08 are formulated using the following conversion factors:**

   if unit=1(days) then BF_ENDR06 = number x 1
   if unit=2(weeks) then BF_ENDR06 = number x 7
   if unit=3(months) then BF_ENDR06 = number x 30.4375
   if unit=4(years) then BF_ENDR06 = number x 365.25

   if unit=1(days) then BF_FORMR08 = number x 1
   if unit=2(weeks) then BF_FORMR08 = number x 7
   if unit=3(months) then BF_FORMR08 = number x 30.4375
   if unit=4(years) then BF_FORMR08 = number x 365.25

2. **Flagging BF_ENDR06 when the duration of any breastfeeding exceeds the age in days with a buffer for different units:**

   if unit=1(days) flag when BF_ENDR06 > age + 1
   if unit=2(weeks) flag when BF_ENDR06 > age + 3
   if unit=3(months) flag when BF_ENDR06 > age + 15
   if unit=4(years) flag when BF_ENDR06 > age + 182

The different buffers allow for the impact of rounding durations upward in the specified units (for example, 50 days might be reported as 2 months).

3. **Flagging BF_FORMR08 when the age when first fed formula exceeds the age in days with a buffer for different units:**

   if unit=1(days) flag when BF_FORMR08 > age + 1
   if unit=2(weeks) flag when BF_FORMR08 > age + 3
   if unit=3(months) flag when BF_FORMR08 > age + 15
   if unit=4(years) flag when BF_FORMR08 > age + 182

The different buffers allow for the impact of rounding durations upward in the specified units (for example, 50 days might be reported as 2 months).

Appendix D: Programs for Estimation: Examples of the Use of SUDAAN, SAS, and R to Estimate Vaccination Coverage Rates and Their Standard Errors, and an Example of the Production of a Cross-Tabulation and Chart

A. SUDAAN

```
**********;
title1 'SUD_IAP.SAS';
*********************************************************************
THIS PROGRAM WILL PRODUCE ESTIMATION AREA ESTIMATES AND STANDARD ERRORS FOR
PUTD4313 USING SAS CALLABLE SUDAAN.
SUDAAN NOTES:
1. ALL VARIABLES USED MUST BE NUMERIC.
2. VARIABLES IN THE SUBGROUP STATEMENT MUST HAVE VALUES 1,2,..K
WHERE K IS THE NUMBER OF LEVELS FOR EACH VARIABLE.
3. DATA MUST BE SORTED ACCORDING TO THE SAMPLE DESIGN VARIABLES
(STRATUM AND PRIMARY SAMPLING UNIT), SPECIFIED IN THE
NEST STATEMENT.
*********************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;

*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;
%let in  file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let estiap=estiap13; * --- ESTIMATION AREA VARIABLE TO USE ---*;
%let wt=provwt_d; * --- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use PROVWTVIGU  D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;

Proc format;
/*
THE FOLLOWING FORMAT WILL BE USED FOR PUTD4313.
ORIGINAL VALUES OF PUTD4313 ARE 1,0.
MUST BE CONVERTED TO 1,2 IN SUDAAN.
*/
value put4313f
1='4:3:1:3 Up-to-Date'
2='Not 4:3:1:3 Up-to-Date';

value estiapf
. = "Missing"
 0 = "US Total"
 1 = "CT"
 2 = "MA"
 4 = "ME"
 5 = "NH"
 6 = "RI"
 7 = "VT"
 8 = "NJ"
10 = "NY-Rest of State"
11 = "NY-City of New York"
```

```
12 = "DC"
13 = "DE"
14 = "MD"
16 = "PA-Rest of State"
17 = "PA-Philadelphia County"
18 = "VA"
19 = "WV"
20 = "AL"
22 = "FL"
25 = "GA"
27 = "KY"
28 = "MS"
29 = "NC"
30 = "SC"
31 = "TN"
34 = "IL-Rest of State"
35 = "IL-City of Chicago"
36 = "IN "
38 = "MI"
40 = "MN"
41 = "OH"
44 = "WI"
46 = "AR"
47 = "LA"
49 = "NM"
50 = "OK"
51 = "TX-Rest of State"
53 = "TX-El Paso County"
54 = "TX-City of Houston"
55 = "TX-Bexar County"
56 = "IA"
57 = "KS"
58 = "MO"
59 = "NE"
60 = "CO"
61 = "MT"
62 = "ND"
63 = "SD"
64 = "UT"
65 = "WY"
66 = "AZ"
68 = "CA"
72 = "HI"
73 = "NV"
74 = "AK"
75 = "ID"
76 = "OR"
77 = "WA"
95 = "U.S. Virgin Islands"
105 = "Guam"
;
run;
```

```
data sud_file;
set &in  file(keep= seqnumhh seqnumc putd4313 &estiap &wt &strat);
if putd4313=0 then putd4313=2; *--- CONVERT PUTD4313=0 TO PUTD4313=2 ---*;
nseqnumh=1*seqnumhh; *---CONVERT HOUSEHOLD ID SEQNUMHH FROM CHARACTER TO NUMERIC ---*;
run;
*=== SORT BY NEST VARIABLES: STRATUM (STRATUM) NSEQNUMH (PRIMARY SAMPLING UNIT) ===*;
proc sort;
by &strat nseqnumh;
run;
proc crosstab data=sud_file filetype=sas design=wr;
weight &wt;
nest &strat nseqnumh;
subgroup &estiap putd4313 ;
levels 100 2 ;
tables &estiap * putd4313 ;
print nsum wsum rowper serow/style=nchs ;
rtitle "4:3:1:3 ESTIMATES BY Estimation Area";
rformat &estiap estiapf.;
rformat putd4313 put4313f.;
output rowper serow/filename=sud_est filetype=sas;
run;
proc print data=sud  est(where=(putd4313=1 and rowper ne .)) noobs label;
format &estiap estiapf.;
var &estiap rowper serow ;
label
rowper='Percent 4:3:1:3 Up-to-Date'
serow='Standard Error'
;
title "4:3:1:3 ESTIMATES BY Estimation Area";
run;

**********;
title1 'SUDSTATE.SAS';
********************************************************************************
THIS PROGRAM WILL PRODUCE STATE ESTIMATES AND STANDARD ERRORS
FOR PUTD4313 USING SAS CALLABLE SUDAAN.
NOTE : THE STATE VARIABLE IS BASED ON FIPSTATE CODES ,THERE ARE
NO STATES WITH FIPS CODES 3,7,14,43,52,57-77.
SUDAAN NOTES:
1. ALL VARIABLES USED MUST BE NUMERIC.
2. VARIABLES IN THE SUBGROUP STATEMENT MUST HAVE VALUES 1,2,..K
WHERE K IS THE NUMBER OF LEVELS FOR EACH VARIABLE.
3. DATA MUST BE SORTED ACCORDING TO THE SAMPLE DESIGN VARIABLES
(STRATUM AND PRIMARY SAMPLING UNIT), SPECIFIED IN THE
NEST STATEMENT.
**********************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf113'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;
```

```
*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;
%let in  file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=provwt_d; *--- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use PROVWTVIGU_D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;

PROC FORMAT;
/*
THE FOLLOWING FORMAT WILL BE USED FOR PUTD4313.
ORIGINAL VALUES OF PUTD4313 ARE 1,0.
MUST BE CONVERTED TO 1,2 IN SUDAAN.
*/
value put4313f
1='4:3:1:3 Up-to-Date'
2='Not 4:3:1:3 Up-to-Date'
;
value statef
0 ='U.S. Total'
1 ='Alabama '
2 ='Alaska '
4 ='Arizona '
5 ='Arkansas '
6 ='California '
8 ='Colorado '
9 ='Connecticut '
10 ='Delaware '
11 ='District of Columbia'
12 ='Florida '
13 ='Georgia '
15 ='Hawaii '
16 ='Idaho '
17 ='Illinois '
18 ='Indiana '
19 ='Iowa '
20 ='Kansas '
21 ='Kentucky '
22 ='Louisiana '
23 ='Maine '
24 ='Maryland '
25 ='Massachusetts '
26 ='Michigan '
27 ='Minnesota '
28 ='Mississippi '
29 ='Missouri '
30 ='Montana '
31 ='Nebraska '
32 ='Nevada '
33 ='New Hampshire '
34 ='New Jersey '
35 ='New Mexico '
36 ='New York '
```

```
37 ='North Carolina '
38 ='North Dakota '
39 ='Ohio '
40 ='Oklahoma '
41 ='Oregon '
42 ='Pennsylvania '
44 ='Rhode Island '
45 ='South Carolina '
46 ='South Dakota '
47 ='Tennessee '
48 ='Texas '
49 ='Utah '
50 ='Vermont '
51 ='Virginia '
53 ='Washington '
54 ='West Virginia '
55 ='Wisconsin '
56 ='Wyoming '
66 ='Guam '
78 ='U.S. Virgin Islands '
;
run;
data sud_file;
set &in  file(keep= seqnumhh seqnumc putd4313 state &wt &strat);
if putd4313=0 then putd4313=2; *** CONVERT PUTD4313=0 TO PUTD4313=2 ***;
nseqnumh=1*seqnumhh; *** CONVERT HOUSEHOLD ID SEQNUMH FROM CHARACTER TO NUMERIC ***;
run;
*=== SORT BY NEST VARIABLES: STRATUM (STRATUM) NSEQNUMH (PRIMARY SAMPLING UNIT) ===*;
proc sort;
by &strat nseqnumh;
run;
proc crosstab data=sud_file filetype=sas design=wr;
weight &wt;
nest &strat nseqnumh;
subgroup state putd4313 ;
levels 56 2 ;
tables state * putd4313 ;
print nsum wsum rowper serow/style=nchs ;
rtitle "4:3:1:3 ESTIMATES BY STATE";
rformat state statef.;
rformat putd4313 put4313f.;
output rowper serow / filename=sud_est2 filetype=sas;
run;
*** EXCLUDE 3,7,14,43,52,57-65,67-77 THERE ARE NO STATES WITH THESE FIPS CODES *** ;
proc print data=sud_est2(where=(putd4313=1
& state notin (3,7,14,43,52) & not(57<=state<=65) & not(67<=state<=77)) label noobs;
format state statef.;
var state rowper serow ;
label
rowper='Percent 4:3:1:3 Up-to-Date'
serow='Standard Error'
;
```

```
title "4:3:1:3 ESTIMATES BY STATE";
run;

**********;
title1 'PROG_3.SAS';
*************************************************************************
THIS PROGRAM WILL PRODUCE A TABLE OF HAD  CPOX BY STATE FOR ALL RDD
COMPLETES USING RDDWT_D. THE PROGRAM USES SAS CALLABLE SUDAAN.
SUDAAN NOTES:
1. ALL VARIABLES USED MUST BE NUMERIC.
2. VARIABLES IN THE SUBGROUP STATEMENT MUST HAVE VALUES 1,2,..K
WHERE K IS THE NUMBER OF LEVELS FOR EACH VARIABLE.
3. DATA MUST BE SORTED ACCORDING TO THE SAMPLE DESIGN VARIABLES
(STRATUM AND PRIMARY SAMPLING UNIT), SPECIFIED IN THE
NEST STATEMENT.
*************************************************************************;
options ps=78 ls=90 obs= max;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;

*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;
%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=rddwt_d; * --- WEIGHT TO USE (RDDWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use RDDWTVIGU_D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;

PROC FORMAT;
/*
THE FOLLOWING FORMAT WILL BE USED FOR PUTD4313.
ORIGINAL VALUES OF PUTD4313 ARE 1,0.
MUST BE CONVERTED TO 1,2 IN SUDAAN.
*/
value hadcpoxf
1='Yes'
2='No'
;
value statef
0 ='U.S. Total '
1 ='Alabama '
2 ='Alaska '
4 ='Arizona '
5 ='Arkansas '
6 ='California '
8 ='Colorado '
9 ='Connecticut '
10 ='Delaware '
11 ='District of Columbia'
12 ='Florida '
```

```
13 ='Georgia '
15 ='Hawaii '
16 ='Idaho '
17 ='Illinois '
18 ='Indiana '
19 ='Iowa '
20 ='Kansas '
21 ='Kentucky '
22 ='Louisiana '
23 ='Maine '
24 ='Maryland '
25 ='Massachusetts '
26 ='Michigan '
27 ='Minnesota '
28 ='Mississippi '
29 ='Missouri '
30 ='Montana '
31 ='Nebraska '
32 ='Nevada '
33 ='New Hampshire '
34 ='New Jersey '
35 ='New Mexico '
36 ='New York '
37 ='North Carolina '
38 ='North Dakota '
39 ='Ohio '
40 ='Oklahoma '
41 ='Oregon '
42 ='Pennsylvania '
44 ='Rhode Island '
45 ='South Carolina '
46 ='South Dakota '
47 ='Tennessee '
48 ='Texas '
49 ='Utah '
50 ='Vermont '
51 ='Virginia '
53 ='Washington '
54 ='West Virginia '
55 ='Wisconsin '
56 ='Wyoming '
66 ='Guam '
78 ='U.S. Virgin Islands '
;
run;
data sud_file;
set &in  file(keep= seqnumhh seqnumc state had  cpox &wt &strat);
nseqnumh=1*seqnumhh; *** CONVERT HOUSEHOLD ID SEQNUMH FROM CHARACTER TO NUMERIC ***;
run;
*=== SORT BY NEST VARIABLES: STRATUM (STRATUM) NSEQNUMH (PRIMARY SAMPLING UNIT) ===*;
proc sort;
by &strat nseqnumh;
```

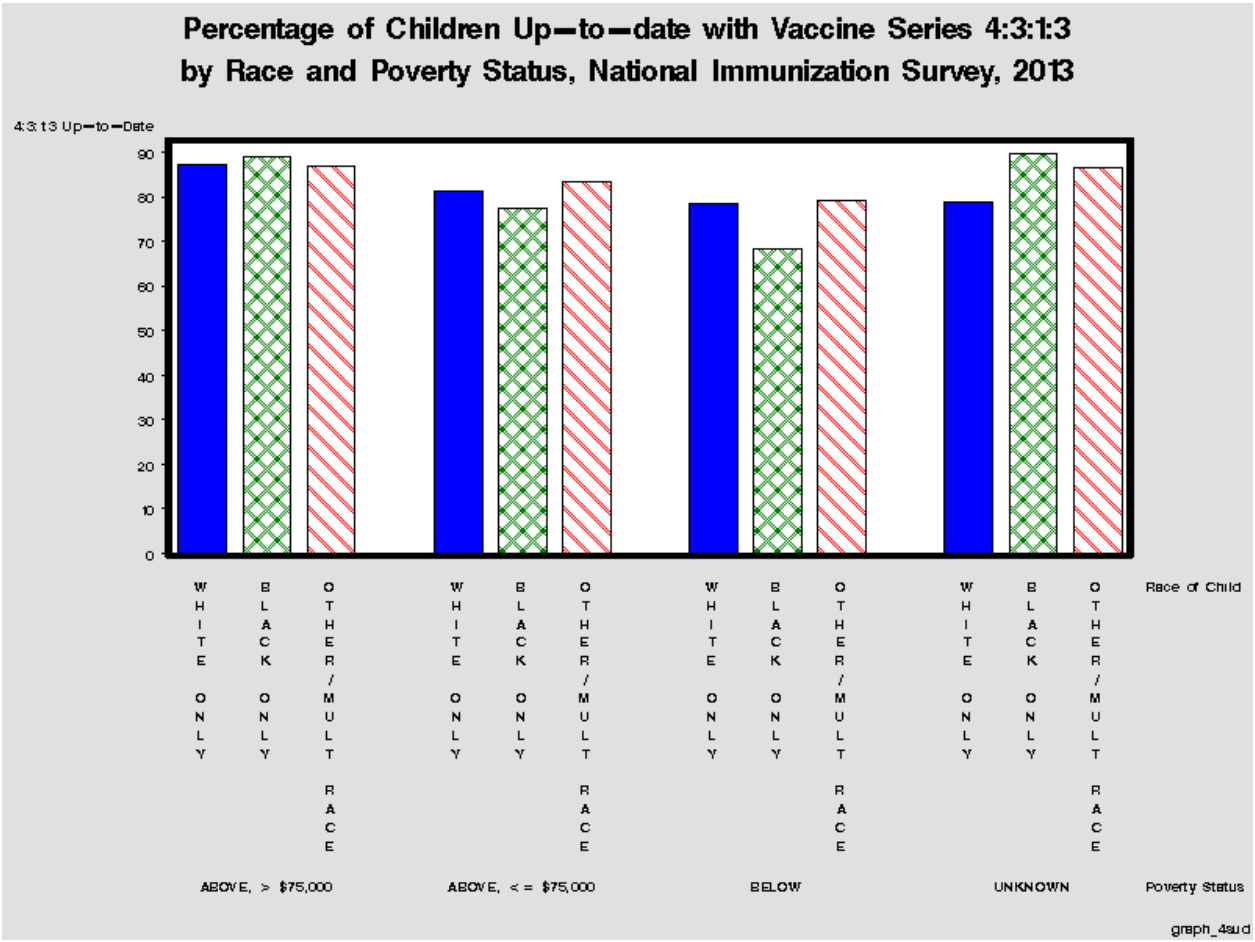
```
run;
proc crosstab data=sud_file filetype=sas design=wr;
weight &wt;
nest &strat nseqnumh;
subgroup state had_cpox ;
levels 56 2 ;
tables state * had  cpox ;
print nsum wsum rowper serow/style=nchs ;
rtitle "HAD_CPOX ESTIMATES BY STATE";
rtitle "WEIGHT = &WT";
rformat state statef.;
rformat had_cpox hadcpoxf.;
output rowper serow / filename=sud_est3 filetype=sas;
run;
*** EXCLUDE 3,7,14,43,52,57-65,67-77 THERE ARE NO STATES WITH THESE FIPS CODES *** ;
proc print data=sud  est3(where=(had  cpox=1
& state notin (3,7,14,43,52) & not(57<=state<=65) & not(67<=state<=77)) label noobs;
format state statef.;
var state rowper serow ;
label
rowper='Percent HAD_CPOX = Yes'
serow='Standard Error'
;
title "CHILD HAD CHICKEN POX BY STATE";
run;


**********;
title1 'PROG_4.SAS';
*************************************************************************
TABLE OF PUTD4313 BY INCPOV1 BY RACE_K. SAVE % UTD
ESTIMATES (NOT S.E.'S) FOR USE IN THE PROGRAM CHART_4.
THIS PROGRAM WILL PRODUCE ESTIMATES USING SAS CALLABLE SUDAAN.
SUDAAN NOTES:
1. ALL VARIABLES USED MUST BE NUMERIC.
2. VARIABLES IN THE SUBGROUP STATEMENT MUST HAVE VALUES 1,2,..K
WHERE K IS THE NUMBER OF LEVELS FOR EACH VARIABLE.
3. DATA MUST BE SORTED ACCORDING TO THE SAMPLE DESIGN VARIABLES
(STRATUM AND PRIMARY SAMPLING UNIT), SPECIFIED IN THE
NEST STATEMENT.
*************************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;

*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;

libname out 'c:\nispuf13'; *--- SPECIFY THE PATH FOR WHERE YOU WANT THE CHART OUTPUT TO GO ---*;
```

```
%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=provwt_d; *--- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands and Guam, use PROVWTVIGU  D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;
%let qtr_lab=Q1/2013 - Q4/2013; *NIS 4 QUARTER PERIOD*;

PROC FORMAT;
/*
THE FOLLOWING FORMAT WILL BE USED FOR PUTD4313.
ORIGINAL VALUES OF PUTD4313 ARE 1,0.
MUST BE CONVERTED TO 1,2 IN SUDAAN.
*/
value put4313f
1='4:3:1:3 Up-to-date'
2='Not 4:3:1:3 Up-to-date'
;
VALUE RACE  KF
1 = "WHITE ONLY"
2 = "BLACK ONLY"
3 = "OTHER AND MULTIPLE RACE"
;
VALUE INCPVR2F
1 = "ABOVE, > $75,000"
2 = "ABOVE, <= $75,000"
3 = "BELOW"
4 = "UNKNOWN"
;
value statef
0 ='U.S. Total '
1 ='Alabama '
2 ='Alaska '
4 ='Arizona '
5 ='Arkansas '
6 ='California '
8 ='Colorado '
9 ='Connecticut '
10 ='Delaware '
11 ='District of Columbia'
12 ='Florida '
13 ='Georgia '
15 ='Hawaii '
16 ='Idaho '
17 ='Illinois '
18 ='Indiana '
19 ='Iowa '
20 ='Kansas '
21 ='Kentucky '
22 ='Louisiana '
23 ='Maine '
24 ='Maryland '
25 ='Massachusetts '
26 ='Michigan '
```

```
27 ='Minnesota '
28 ='Mississippi '
29 ='Missouri '
30 ='Montana '
31 ='Nebraska '
32 ='Nevada '
33 ='New Hampshire '
34 ='New Jersey '
35 ='New Mexico '
36 ='New York '
37 ='North Carolina '
38 ='North Dakota '
39 ='Ohio '
40 ='Oklahoma '
41 ='Oregon '
42 ='Pennsylvania '
44 ='Rhode Island '
45 ='South Carolina '
46 ='South Dakota '
47 ='Tennessee '
48 ='Texas '
49 ='Utah '
50 ='Vermont '
51 ='Virginia '
53 ='Washington '
54 ='West Virginia '
55 ='Wisconsin '
56 ='Wyoming '
66 ='Guam '
78 ='U.S. Virgin Islands '
;
run;
data sud_file;
set &in  file(keep= seqnumhh seqnumc putd4313 race  k incpov1 &wt &strat);
nseqnumh=1*seqnumhh; *** CONVERT HOUSEHOLD ID SEQNUMH FROM CHARACTER TO NUMERIC ***;
if putd4313=0 then putd4313=2; *** CONVERT PUTD4313=0 TO PUTD4313=2 ***;
run;
*=== SORT BY NEST VARIABLES: STRATUM (STRATUM) NSEQNUMH (PRIMARY SAMPLING UNIT) ===*;
proc sort;
by &strat nseqnumh;
run;
proc freq;
tables putd4313 incpov1 race_k;
run;
title3 "Table 4A. &qtr_lab: Unweighted Frequencies";
proc crosstab data=sud_file filetype=sas design=wr;
weight &wt;
nest &strat nseqnumh;
subgroup incpov1 race_k putd4313 ;
levels 4 3 2 ;
tables (incpov1 * race_k * putd4313) ;
print nsum wsum rowper="4:3:1:3 Up-to-Date (ROWPER)"
```

```
serow="Standard Error (SEROW)" /style=nchs ;
rtitle "Table 4B. &qtr_lab, Percent 4:3:1:3 Up-to-Date and Estimated Standard Errors";
rtitle "WEIGHT = &WT";
rformat putd4313 put4313f.;
rformat incpov1 incpvr2f.;
rformat race_k race_kf.;
output rowper serow / filename=sud_est4 filetype=sas;
run;
data out.sud  est4;
set sud_est4(where=(putd4313=1 & incpov1 > 0 & race_k > 0));
keep incpov1 race_k rowper serow;
label rowper='4:3:1:3 Up-to-Date';
format rowper 5.2;
format serow 5.2;
run;
proc print data=out.sud_est4 label;
format race_k race_kf.;
format incpov1 incpvr2f.;
title "&qtr_lab: 4:3:1:3 ESTIMATES AND STANDARD ERRORS BY INCPOV1 BY RACE_K";
run;

**********;
title1 'SAS_GRAPH_4.SAS';
*************************************************************************
THIS PROGRAM BUILDS OFF OF THE PROGRAM SAS_PROG_4. IT PRODUCES A CHART OF
PUTD4313 BY INCPOV1 BY RACE_K. IT CREATES A BAR CHART IN SAS GRAPH FOR
THE 4X3 = 12 CELLS. THE OUTPUT OF THE FOLLOWING EXAMPLE IS ATTACHED AT THE
END.
*************************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;

%let out='c:\nispuf13'; *--- SPECIFY THE PATH FOR WHERE YOU WANT THE CHART
OUTPUT TO GO ---*;

%let in_file=dd.sud_est4; *--- NAME OF SAS DATASET OUTPUT FROM PROG_4 ---*;
%let qtr  lab=Q1/2013 - Q4/2013; *NIS 4 QUARTER PERIOD*;
PROC FORMAT;
VALUE INCPVR2F
1 = "ABOVE, > $75,000"
2 = "ABOVE, <= $75,000"
3 = "BELOW"
4 = "UNKNOWN"
;
VALUE RACE  KF
1 = "WHITE ONLY"
2 = "BLACK ONLY"
3 = "OTHER/MULT RACE"
;
run;
data sud_est4;
```

```
set &in  file;
format rowper 3.
race  k race  kf.
incpov1 incpvr2f.
;
label
race  k = 'Race of Child'
incpov1 = 'Poverty Status'
;
filename odsout &out;
ods listing close;
/* SET THE GRAPHICS ENVIRONMENT */
goptions reset=global gunit=pct border
ftext=swissb htitle=4 htext=1.5
device=gif
;
ods html body='graph  4  sud.html' path=odsout;
TITLE1 HEIGHT=3 "Percentage of Children Up-to-date with Vaccine Series 4:3:1:3";
TITLE2 HEIGHT=3 "by Race and Poverty Status, National Immunization Survey, 2013";
footnote j=r 'graph_4sud';
pattern1 value = solid color = blue;
pattern2 value = x3 color = green;
pattern3 value = l3 color = red;
pattern4 value = empty color = lib;
axis width = 3;
run;
proc gchart data=sud_est4;
vbar race_k
/frame
discrete
sumvar=rowper
group=incpov1
gspace = 5
gaxis = axis
raxis = axis
name = 'graph_4_sud'
patternid = midpoint
;
run;
quit;
ods html close;
ods listing;
ods html close;
ods listing;
```


Percentage of Children Up—to—date with Vaccine Series 4:3:1:3
by Race and Poverty Status, National Immunization Survey, 2013
4:3:1:3 Up—to—Date
90
80
70
60
50
40
30
20
10
0
WHITE ONLY
BLACK ONLY
OTHER/MULTIRACE
Race of Child
ABOVE, > $75,000
ABOVE, <= $75,000
BELOW
UNKNOWN
Poverty Status
graph_4sud

B. SAS

```
**********************;
title1 'SAS_IAP.SAS';
*********************************************************************
THIS PROGRAM WILL PRODUCE ESTIMATION AREA ESTIMATES AND STANDARD ERRORS
FOR PUTD4313 USING SAS.
*********************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS STORED ---*;

*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;
%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let estiap=estiap13; * --- ESTIMATION AREA VARIABLE TO USE ---*;
%let wt=provwt_d; * --- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use PROVWTVIGU_D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;
proc format;
value put4313f
0='Not 4:3:1:3 Up-To-Date'
1='4:3:1:3 Up-To-Date';

value estiapf
. = "Missing"
 0 = "US Total"
 1 = "CT"
 2 = "MA"
 4 = "ME"
 5 = "NH"
 6 = "RI"
 7 = "VT"
 8 = "NJ"
10 = "NY-Rest of State"
11 = "NY-City of New York"
12 = "DC"
13 = "DE"
14 = "MD"
16 = "PA-Rest of State"
17 = "PA-Philadelphia County"
18 = "VA"
19 = "WV"
20 = "AL"
22 = "FL"
25 = "GA"
27 = "KY"
28 = "MS"
```

```
29 = "NC"
30 = "SC"
31 = "TN"
34 = "IL-Rest of State"
35 = "IL-City of Chicago"
36 = "IN "
38 = "MI"
40 = "MN"
41 = "OH"
44 = "WI"
46 = "AR"
47 = "LA"
49 = "NM"
50 = "OK"
51 = "TX-Rest of State"
53 = "TX-El Paso County"
54 = "TX-City of Houston"
55 = "TX-Bexar County"
56 = "IA"
57 = "KS"
58 = "MO"
59 = "NE"
60 = "CO"
61 = "MT"
62 = "ND"
63 = "SD"
64 = "UT"
65 = "WY"
66 = "AZ"
68 = "CA"
72 = "HI"
73 = "NV"
74 = "AK"
75 = "ID"
76 = "OR"
77 = "WA"
95 = "U.S. Virgin Islands"
105 = "Guam"
;
run;
data sas  file;
set &in_file(keep= seqnumhh seqnumc putd4313 &estiap &wt &strat);
run;
proc sort data = sas_file;
by &estiap;
run;
title1 '4:3:1:3 ESTIMATES BY Estimation Area';
ods output Statistics=sas_est;
proc surveymeans data = sas_file nobs sum mean stderr;
stratum &strat;
cluster seqnumhh;
weight &wt;
```

```
class putd4313;
var putd4313;
by &estiap;
format putd4313 put4313f.;
format &estiap estiapf.;
run;
data sas  est;
set sas_est;
mean = mean*100; *CONVERT TO PERCENT ESTIMATES;
stderr = stderr*100;
run;
proc print data=sas_est(where=(varlevel='4:3:1:3 Up-To-Date')) noobs
label;
format &estiap estiapf.;
format mean stderr 5.2;
var &estiap mean stderr;
label
mean='Percent 4:3:1:3 Up-to-Date'
stderr='Standard Error';
title "4:3:1:3 ESTIMATES BY Estimation Area";
run;

**********;
title1 'SASSTATE.SAS';
********************************************************************
THIS PROGRAM WILL PRODUCE STATE ESTIMATES AND STANDARD ERRORS
FOR PUTD4313 USING SAS.
NOTE : THE STATE VARIABLE IS BASED ON FIPSTATE CODES ,THERE ARE
NO STATES WITH FIPS CODES 3,7,14,43,52,57-65,67-77.
********************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;
*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;

%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=provwt_d; * --- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use PROVWTVIGU  D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;
proc format;
value put4313f
0='Not 4:3:1:3 Up-To-Date'
1='4:3:1:3 Up-To-Date';
value statef
. ="Missing"
0 ='U.S. Total '
1 ='Alabama '
2 ='Alaska '
4 ='Arizona '
```

```
5 ='Arkansas '
6 ='California '
8 ='Colorado '
9 ='Connecticut '
10 ='Delaware '
11 ='District of Columbia'
12 ='Florida '
13 ='Georgia '
15 ='Hawaii '
16 ='Idaho '
17 ='Illinois '
18 ='Indiana '
19 ='Iowa '
20 ='Kansas '
21 ='Kentucky '
22 ='Louisiana '
23 ='Maine '
24 ='Maryland '
25 ='Massachusetts '
26 ='Michigan '
27 ='Minnesota '
28 ='Mississippi '
29 ='Missouri '
30 ='Montana '
31 ='Nebraska '
32 ='Nevada '
33 ='New Hampshire '
34 ='New Jersey '
35 ='New Mexico '
36 ='New York '
37 ='North Carolina '
38 ='North Dakota '
39 ='Ohio '
40 ='Oklahoma '
41 ='Oregon '
42 ='Pennsylvania '
44 ='Rhode Island '
45 ='South Carolina '
46 ='South Dakota '
47 ='Tennessee '
48 ='Texas '
49 ='Utah '
50 ='Vermont '
51 ='Virginia '
53 ='Washington '
54 ='West Virginia '
55 ='Wisconsin '
56 ='Wyoming '
66 ='Guam '
78 ='U.S. Virgin Islands '
;
run;
```

```
data sas_file;
set &in_file(keep= seqnumhh seqnumc putd4313 state &wt &strat);
run;
proc sort data = sas_file;
by state;
title1 '4:3:1:3 ESTIMATES BY STATE';
ods output Statistics=sas_est2;
run;
proc surveymeans data = sas_file nobs sum mean stderr;
stratum &strat;
cluster seqnumhh;
weight &wt;
class putd4313;
var putd4313;
by state;
format putd4313 put4313f.;
format state statef.;
run;
data sas_est2;
set sas  est2;
mean = mean*100; *CONVERT TO PERCENT ESTIMATES;
stderr = stderr*100;
run;
proc print data=sas_est2(where=(varlevel='4:3:1:3 Up-To-Date')) noobs
label;
format state statef.;
format mean stderr 5.2;
var state mean stderr;
label
mean='Percent 4:3:1:3 Up-to-Date'
stderr='Standard Error';
title "4:3:1:3 ESTIMATES BY STATE";
run;

**********;
title1 'SAS_PROG_3.SAS';
*************************************************************************
THIS PROGRAM WILL PRODUCE A TABLE OF HAD_CPOX BY STATE FOR ALL RDD
COMPLETES USING RDDWT. THE PROGRAM USES SAS.
*************************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;
*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;

%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=rddwt_d; *--- WEIGHT TO USE (RDDWT_D is the dual-frame weight excluding the U.S. Virgin Islands and
Guam, use RDDWTVIGU_D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;
```

```
PROC FORMAT;
value hadcpoxf
1='Yes'
2='No'
;
value statef
0 ='U.S. Total '
1 ='Alabama '
2 ='Alaska '
4 ='Arizona '
5 ='Arkansas '
6 ='California '
8 ='Colorado '
9 ='Connecticut '
10 ='Delaware '
11 ='District of Columbia'
12 ='Florida '
13 ='Georgia '
15 ='Hawaii '
16 ='Idaho '
17 ='Illinois '
18 ='Indiana '
19 ='Iowa '
20 ='Kansas '
21 ='Kentucky '
22 ='Louisiana '
23 ='Maine '
24 ='Maryland '
25 ='Massachusetts '
26 ='Michigan '
27 ='Minnesota '
28 ='Mississippi '
29 ='Missouri '
30 ='Montana '
31 ='Nebraska '
32 ='Nevada '
33 ='New Hampshire '
34 ='New Jersey '
35 ='New Mexico '
36 ='New York '
37 ='North Carolina '
38 ='North Dakota '
39 ='Ohio '
40 ='Oklahoma '
41 ='Oregon '
42 ='Pennsylvania '
44 ='Rhode Island '
45 ='South Carolina '
46 ='South Dakota '
47 ='Tennessee '
48 ='Texas '
49 ='Utah '
```

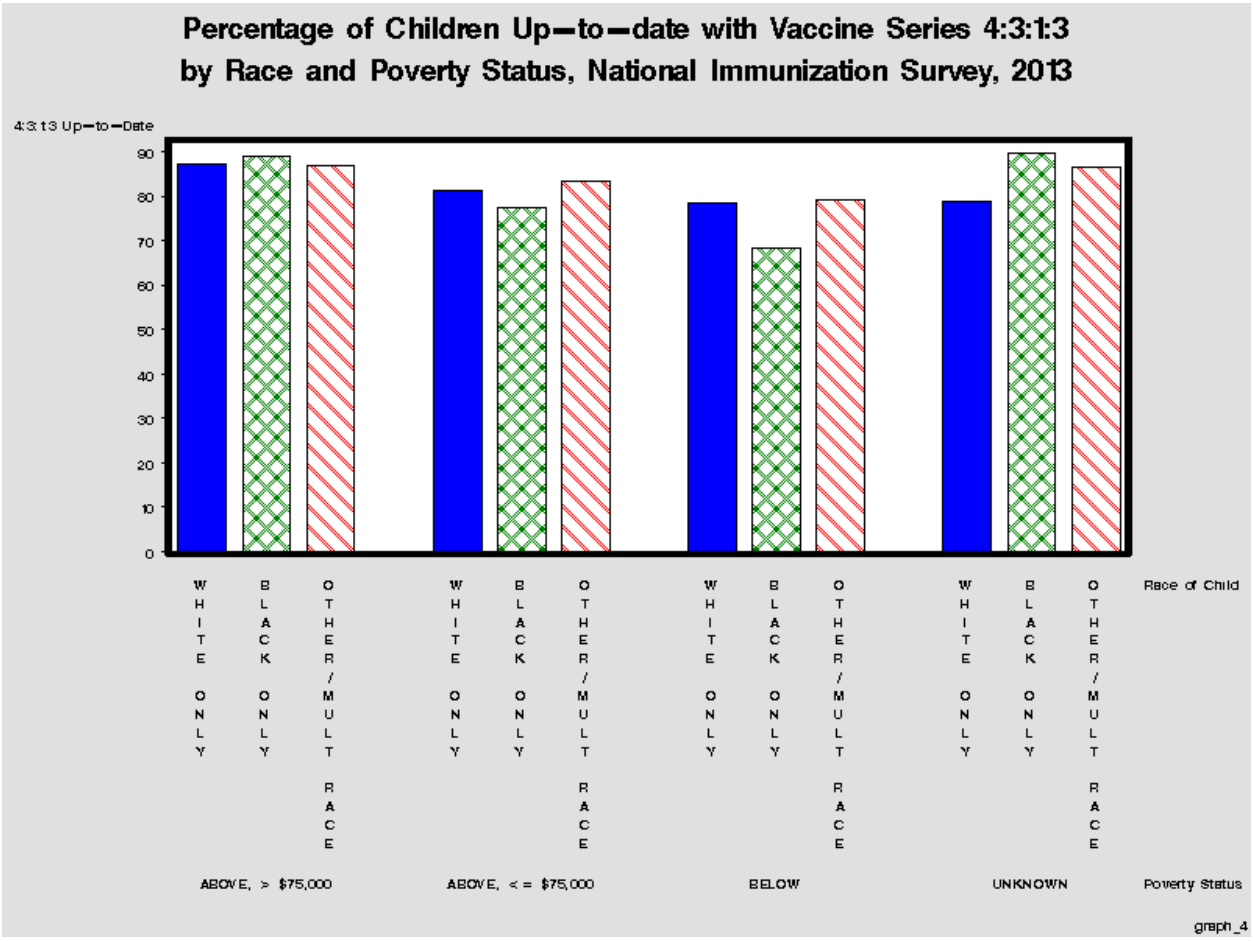
```
50 ='Vermont '
51 ='Virginia '
53 ='Washington '
54 ='West Virginia '
55 ='Wisconsin '
56 ='Wyoming '
66 ='Guam '
78 ='U.S. Virgin Islands '
;
run;
data sas_file;
set &in_file(keep= seqnumhh seqnumc state had_cpox &wt &strat);
run;
proc sort data = sas_file;
by state;
title1 'HAD_CPOX ESTIMATES BY STATE';
ods output Statistics=sas_est3;
run;
proc surveymeans data = sas_file nobs sum mean stderr;
stratum &strat;
cluster seqnumhh;
weight &wt;
class had_cpox;
var had_cpox;
by state;
format had_cpox hadcpoxf.;
format state statef.;
run;
data sas_est3;
set sas  est3;
mean = mean*100; *CONVERT TO PERCENT ESTIMATES;
stderr = stderr*100;
run;
proc print data=sas_est3(where=(varlevel='Yes')) noobs label;
format state statef.;
format mean stderr 5.2;
var state mean stderr;
label
mean='Percent HAD_CPOX = Yes'
stderr='Standard Error';
title "CHILD HAD CHICKEN POX BY ESTIMATION AREA";
run;


**********;
title1 'SAS_PROG_4.SAS';
*************************************************************************
TABLE OF PUTD4313 BY INCPOV1 BY RACE_K. SAVE % UTD
ESTIMATES (NOT S.E.'S) FOR USE IN THE PROGRAM SAS_GRAPH_4.
THIS PROGRAM WILL PRODUCE ESTIMATES USING SAS.
*************************************************************************;
options ps=78 ls=90 obs= max;
```

```
libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;
libname library 'c:\nispuf13'; *--- IF DATASET WAS CREATED WITH FORMATS
STORED ---*;
*--- PERMANENTLY SPECIFY PATH TO LIBRARY ---*;
*--- OTHERWISE COMMENT THIS STATEMENT OUT ---*;

libname out 'c:\nispuf13'; *--- SPECIFY THE PATH FOR
WHERE YOU WANT THE CHART OUTPUT TO GO ---*;

%let in_file=dd.nispuf13; *--- NAME OF SAS DATASET ---*;
%let wt=provwt_d; *--- WEIGHT TO USE (PROVWT_D is the dual-frame weight excluding the U.S. Virgin Islands, use
PROVWTVIGU_D to include U.S. Virgin Islands and Guam) ---*;
%let strat=stratum; * --- STRATUM VARIABLE TO USE FOR VARIANCE ESTIMATION;
%let qtr  lab=Q1/2013 - Q4/2013; *NIS 4 QUARTER PERIOD*;
PROC FORMAT;
value put4313f
0='Not 4:3:1:3 Up-To-Date'
1='4:3:1:3 Up-To-Date'
;
VALUE RACE  KF
1 = "WHITE ONLY"
2 = "BLACK ONLY"
3 = "OTHER AND MULTIPLE RACE"
;
VALUE INCPVR2F
1 = "ABOVE, > $75,000"
2 = "ABOVE, <= $75,000"
3 = "BELOW"
4 = "UNKNOWN"
;
run;
data sas_file;
set &in_file(keep= seqnumhh seqnumc putd4313 race_k incpov1 &wt &strat);
run;
proc sort data = sas_file;
by incpov1 race_k;
run;
proc freq;
tables putd4313 incpov1 race_k;
title1 "Table 4A. &qtr_lab: Unweighted Frequencies";
run;
data sas_file;
set sas  file;
if putd4313 < 0 | incpov1 < 0 | race_k < 0 | &wt. < 0 then delete;
run;
proc surveymeans data = sas_file nobs sum mean stderr;
ods output Domain=sas_est4;
stratum &strat;
cluster seqnumhh;
weight &wt;
class putd4313;
```

```
var putd4313;
domain incpov1*race_k;
format putd4313 put4313f.;
format incpov1 incpvr2f.;
format race_k race_kf.;
run;
data sas  est4;
set sas_est4;
mean = mean*100; *CONVERT TO PERCENT ESTIMATES;
stderr = stderr*100;
run;
proc print data=sas_est4(where=(varlevel='4:3:1:3 Up-To-Date')) noobs
label;
format incpov1 incpvr2f.;
format race  k race  kf.;
format mean stderr 5.2;
var incpov1 race_k mean stderr;
label
mean='4:3:1:3 Up-To-Date'
stderr='Standard Error';
title1 "Table 4B. &qtr_lab, Percent 4:3:1:3 Up-to-Date and Estimated
Standard Errors";
run;
data out.sas_est4;
set sas_est4(where=(varlevel='4:3:1:3 Up-To-Date'));
keep incpov1 race_k mean;
label mean='4:3:1:3 Up-to-Date';
format mean 5.2;
run;

**********;
title1 'SAS_GRAPH_4.SAS';
********************************************************************************
THIS PROGRAM BUILDS OFF OF THE PROGRAM SAS_PROG_4. IT PRODUCES A CHART OF
PUTD4313 BY INCPOV1 BY RACE_K. IT CREATES A BAR CHART IN SAS GRAPH FOR
THE 4X3 = 12 CELLS. THE OUTPUT OF THE FOLLOWING EXAMPLE IS ATTACHED AT THE
END.
********************************************************************************;
options ps=78 ls=90 obs= max;

libname dd 'c:\nispuf13'; *--- SPECIFY PATH TO SAS DATASET ---*;

%let out='c:\nispuf13'; *--- SPECIFY THE PATH FOR WHERE YOU WANT THE CHART
OUTPUT TO GO ---*;


%let in_file=dd.sas_est4; *--- NAME OF SAS DATASET OUTPUT FROM PROG_4 ---
*;
%let qtr  lab=Q1/2013 - Q4/2013; *NIS 4 QUARTER PERIOD*;
PROC FORMAT;
VALUE INCPVR2F
1 = "ABOVE, > $75,000"
```

```
2 = "ABOVE, <= $75,000"
3 = "BELOW"
4 = "UNKNOWN"
;
VALUE RACE  KF
1 = "WHITE ONLY"
2 = "BLACK ONLY"
3 = "OTHER/MULT RACE"
;
run;
data sas_est4;
set &in  file;
format mean 3.
race_k race_kf.
incpov1 incpvr2f.
;
label
race_k = 'Race of Child'
incpov1 = 'Poverty Status'
;
filename odsout &out;
ods listing close;
/* SET THE GRAPHICS ENVIRONMENT */
goptions reset=global gunit=pct border
ftext=swissb htitle=4 htext=1.5
device=gif
;
ods html body='graph  4.html' path=odsout;
TITLE1 HEIGHT=3 "Percentage of Children Up-to-date with Vaccine Series 4:3:1:3";
TITLE2 HEIGHT=3 "by Race and Poverty Status, National Immunization Survey, 2013";
footnote j=r 'graph_4';
pattern1 value = solid color = blue;
pattern2 value = x3 color = green;
pattern3 value = l3 color = red;
pattern4 value = empty color = lib;
axis width = 3;
run;
proc gchart data=sas_est4;
vbar race_k
/frame
discrete
sumvar=mean
group=incpov1
gspace = 5
gaxis = axis
raxis = axis
name = 'graph_4'
patternid = midpoint
;
run;
quit;
ods html close;
```

```
ods listing;
```


Percentage of Children Up—to—date with Vaccine Series 4:3:1:3
by Race and Poverty Status, National Immunization Survey, 2013
4:3:1:3 Up—to—Date
90
80
70
60
50
40
30
20
10
0
WHITE ONLY
BLACK ONLY
OTHER/MULT RACE
Race of Child
ABOVE, > $75,000
ABOVE, <= $75,000
BELOW
UNKNOWN
Poverty Status
graph_4

C. ‘R’

```
#####################
title <- "R_IAP.R"
#########################################################################
#THIS PROGRAM WILL PRODUCE ESTIMATION AREA ESTIMATES AND STANDARD ERRORS
#FOR PUTD4313 USING R.
#
#R NOTES:
#1. R IS CASE SENSITIVE.
#2. A FILE PATH IS SEPERATED BY SLASH(/)
#########################################################################
library(survey) #TO USE svydesign(), svymean(), and svyby()
library(Hmisc) #TO USE prn()


dd <- "c:/nispuf13" #"path-to-dataset"


#--- NAME OF R DATASET ---#
in.file <- paste(dd,"/NISPUF13.RData",sep="")
#---READ R DATASET---#
load(in.file)
#---FORMAT---#
UTD4313levels=c(0,1)
UTD4313labels=c("NOT 4:3:1:3 UTD", "4:3:1:3 UTD")
ESTIAPlevels=c(0, 1, 2, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 22, 25, 27, 28, 29, 30, 31, 34, 35, 36, 38, 40, 41, 44, 46, 47, 49, 50, 51, 52,
53, 54, 55, 56, 57, 58, 59, 60, 61, 63, 64, 65, 66, 68, 72, 73, 74, 75, 76, 77, 95, 105)
ESTIAPlabels=c("US Total", "CT", "MA", "ME", "NH", "RI", "VT", "NJ", "NY-Rest of State", "NY-City of New York", "DC", "DE", "MD", "PA-
Rest of State", "PA-Philadelphia County", "VA", "WV", "AL", "FL", "GA", "KY", "MS", "NC", "SC", "TN", "IL-Rest of State", "IL-City of
Chicago", "IN", "MI", "MN", "OH", "WI", "AR", "LA", "NM", "OK", "TX-Rest of State", "TX-El Paso County", "TX-City of Houston", "TX-Bexar
County", "IA", "KS", "MO", "NE", "CO", "MT", "ND", "SD", "UT", "WY", "AZ", "CA", "HI", "NV", "AK", "ID", "OR", "WA", "U.S. Virgin
Islands", "Guam")

#---PROVWT_D WILL BE USED AS A WEIGHT (PROVWT_D IS THE DUAL-FRAME WEIGHT EXCLUDING THE U.S. VIRGIN ISLANDS
AND GUAM. USE PROVWTVIGU_D TO INCLUDE U.S. VIRGIN ISLANDS AND GUAM)---#
#---STRATUM WILL BE USED AS A STRATUM VARIABLE FOR VARIANCE ESTIMATION ---#
R_FILE <- subset(NISPUF13, select=c(SEQNUMHH, SEQNUMC, PUTD4313, ESTIAP13,
PROVWT_D, STRATUM))
names(R_FILE) <- c("SEQNUMHH", "SEQNUMC", "PUTD4313", "ESTIAP", "WT", "STRATUM")
R_FILE <- na.omit(R_FILE)
#---ASSIGN LABELS---#
R_FILE$PUTD4313 <- factor(R_FILE$PUTD4313, levels=UTD4313levels,
labels=UTD4313labels)
R_FILE$ESTIAP <- factor(R_FILE$ESTIAP, levels=ESTIAPlevels,
labels=ESTIAPlabels)

#---SPECIFY A SAMPLING DESIGN AND FORCE WT AS NUMERIC---#
svydsg <- svydesign(id=~SEQNUMHH, strata=~STRATUM, weights=~(as.numeric(WT)),
data=R_FILE)

#---U.S. TOTAL ESTIMATES AND STANDARD ERRORS---#
r_nation <- svymean(~PUTD4313, svydsg)
PERCENT_UTD <- round(r_nation*100,2) #CONVERT INTO PERCENT ESTIMATES(MEAN)
SE_UTD <- round(SE(r_nation)*100,2) #CONVERT INTO PERCENT ESTIMATES(SE)
r_nation_est <- cbind(PERCENT_UTD, SE_UTD)
title <- "PERCENT 4:3:1:3 ESTIMATES AT A NATIONWIDE LEVEL"
prn(r_nation_est, title)

#---ESTIMATION AREA ESTIMATES AND STANDARD ERRORS---#
r_est <- svyby(~PUTD4313, ~ESTIAP, svydsg, svymean)
r_est[,-c(1)] <- round(r_est[,-c(1)]*100,2) #CONVERT INTO PERCENT ESTIMATES
```

```
r_est <- subset(r_est, select=c(1,3,5))


#SELECT ESTIMATES FOR UP-TO-DATE CASES
names(r_est) <- c("ESTIMATION AREA", "PERCENT 4:3:1:3 UTD", "STANDARD ERROR UTD")
title <- "PERCENT 4:3:1:3 ESTIMATES BY ESTIMATION AREA"
prn(r_est, title)

######################
title <- "R_STATE.R"
#############################################################################
#THIS PROGRAM WILL PRODUCE STATE ESTIMATES AND STANDARD ERRORS
#FOR PUTD4313 USING R.
#
#NOTE : THE STATE VARIABLE IS BASED ON FIPSTATE CODES ,THERE ARE
#NO STATES WITH FIPS CODES 3,7,14,43,52,57-65,67-77.
#
#R NOTES:
#1. R IS CASE SENSITIVE.
#2. A FILE PATH IS SEPERATED BY SLASH(/)
#############################################################################
library(survey) #TO USE svydesign(), svymean(), and svyby()
library(Hmisc) #TO USE prn()


dd <- "c:/nispuf13" #"path-to-data"


#--- NAME OF R DATASET ---#
in.file <- paste(dd,"/NISPUF13.RData",sep="")
#---READ R DATASET---#
load(in.file)
#---FORMAT---#
UTD4313levels=c(0,1)
UTD4313labels=c("NOT 4:3:1:3 UTD", "4:3:1:3 UTD")
STATElevels=c(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,
18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
72, 73, 74, 75, 76, 77, 78)
STATElabels=c(
"ALABAMA",
"ALASKA",
" ",
"ARIZONA",
"ARKANSAS",
"CALIFORNIA",
" ",
"COLORADO",
"CONNECTICUT",
"DELAWARE",
"DISTRICT OF COLUMBIA",
"FLORIDA",
"GEORGIA",
" ",
"HAWAII",
"IDAHO",
"ILLINOIS",
"INDIANA",
"IOWA",
"KANSAS",
"KENTUCKY",
"LOUISIANA",
```

```
"MAINE",
"MARYLAND",
"MASSACHUSETTS",
"MICHIGAN",
"MINNESOTA",
"MISSISSIPPI",
"MISSOURI",
"MONTANA",
"NEBRASKA",
"NEVADA",
"NEW HAMPSHIRE",
"NEW JERSEY",
"NEW MEXICO",
"NEW YORK",
"NORTH CAROLINA",
"NORTH DAKOTA",
"OHIO",
"OKLAHOMA",
"OREGON",
"PENNSYLVANIA",
" ",
"RHODE ISLAND",
"SOUTH CAROLINA",
"SOUTH DAKOTA",
"TENNESSEE",
"TEXAS",
"UTAH",
"VERMONT",
"VIRGINIA",
" ",
"WASHINGTON",
"WEST VIRGINIA",
"WISCONSIN",
"WYOMING",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
"Guam ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
"U.S. Virgin Islands")
#---PROVWT_D WILL BE USED AS A WEIGHT (PROVWT_D IS THE DUAL-FRAME WEIGHT EXCLUDING THE U.S. VIRGIN ISLANDS
AND GUAM. USE PROVWTVIGU_D TO INCLUDE U.S. VIRGIN ISLANDS AND GUAM)---#
#---STRATUM WILL BE USED AS A STRATUM VARIABLE FOR VARIANCE ESTIMATION ---#
R_FILE <- subset(NISPUF13, select=c(SEQNUMHH, SEQNUMC, PUTD4313,
STATE, PROVWT_D, STRATUM))
names(R_FILE) <- c("SEQNUMHH", "SEQNUMC", "PUTD4313", "STATE",
"WT","STRATUM")
```

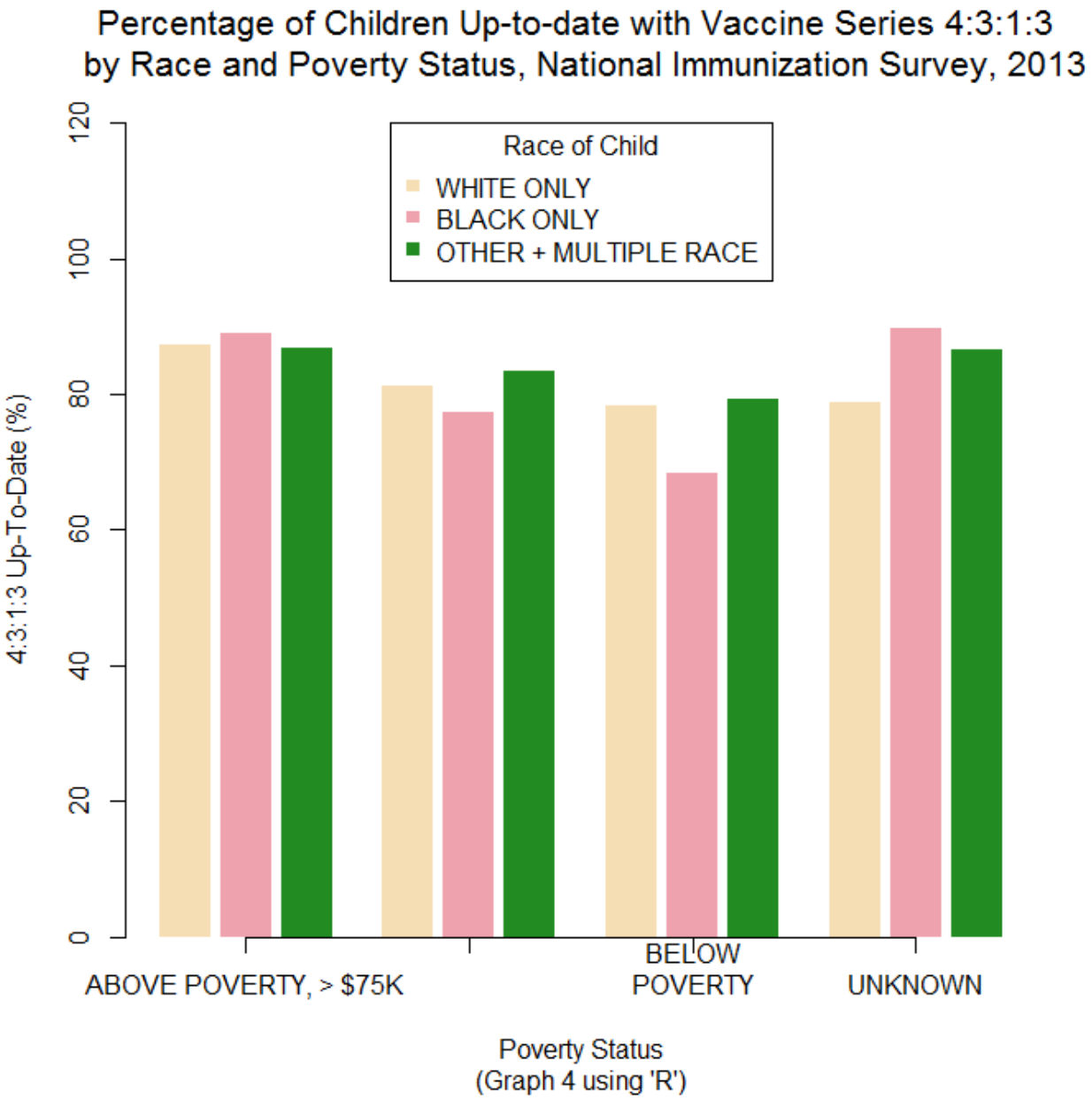
```
R_FILE <- na.omit(R_FILE)
#---ASSIGN LABELS---#
R_FILE$PUTD4313 <- factor(R_FILE$PUTD4313, levels=UTD4313levels,
labels=UTD4313labels)
R_FILE$STATE <- factor(R_FILE$STATE, levels=STATElevels,
labels=STATElabels)
#---SPECIFY A SAMPLING DESIGN AND FORCE WT AS NUMERIC---#
svydsg <- svydesign(id=~SEQNUMHH, strata=~STRATUM, weights=~(as.numeric(WT)),
data=R_FILE)
#---STATE ESTIMATES AND STANDARD ERRORS---#
r_est2 <- svyby(~PUTD4313, ~STATE, svydsg, svymean)
r_est2[,-c(1)] <- round(r_est2[,-c(1)]*100,2) #CONVERT INTO PERCENT ESTIMATES
r_est2 <- subset(r_est2, select=c(1,3,5)) #SELECT ESTIMATES FOR UP-TO-DATE CASES
names(r_est2) <- c("STATE", "PERCENT 4:3:1;3 UTD", "STANDARD ERROR UTD")
prn(r_est2, '4:3:1:3 ESTIMATES BY STATE')

######################
title <- "R_PROG_3.R"
#########################################################################
#THIS PROGRAM WILL PRODUCE A TABLE OF HAD_CPOX BY STATE FOR ALL RDD
#COMPLETES USING RDDWT_D. THE PROGRAM USES R.
#
#R NOTES:
#1. R IS CASE SENSITIVE.
#2. A FILE PATH IS SEPERATED BY SLASH(/)
#########################################################################
library(survey) #TO USE svydesign(), svymean(), and svyby()
library(Hmisc) #TO USE prn()
library(prettyR) #TO USE freq()

#dd <- “c:/nispuf13” #"path-to-dataset"


#--- NAME OF R DATASET ---#
in.file <- paste(dd,"/NISPUF13.RData",sep="")
#---READ R DATASET---#
load(in.file)
#---FORMAT---#
HAD_CPOXlevels=c(1,2,77,99)
HAD_CPOXlabels=c("YES", "NO", "DON'T KNOW", "REFUSED")
STATElevels=c(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,
18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35,
36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53,
54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,
72, 73, 74, 75, 76, 77, 78)
STATElabels=c(
"ALABAMA",
"ALASKA",
" ",
"ARIZONA",
"ARKANSAS",
"CALIFORNIA",
" ",
"COLORADO",
"CONNECTICUT",
"DELAWARE",
"DISTRICT OF COLUMBIA",
"FLORIDA",
"GEORGIA",
" ",
"HAWAII",
"IDAHO",
"ILLINOIS",
```

"INDIANA",
"IOWA",
"KANSAS",
"KENTUCKY",
"LOUISIANA",
"MAINE",
"MARYLAND",
"MASSACHUSETTS",
"MICHIGAN",
"MINNESOTA",
"MISSISSIPPI",
"MISSOURI",
"MONTANA",
"NEBRASKA",
"NEVADA",
"NEW HAMPSHIRE",
"NEW JERSEY",
"NEW MEXICO",
"NEW YORK",
"NORTH CAROLINA",
"NORTH DAKOTA",
"OHIO",
"OKLAHOMA",
"OREGON",
"PENNSYLVANIA",
" ",
"RHODE ISLAND",
"SOUTH CAROLINA",
"SOUTH DAKOTA",
"TENNESSEE",
"TEXAS",
"UTAH",
"VERMONT",
"VIRGINIA",
" ",
"WASHINGTON",
"WEST VIRGINIA",
"WISCONSIN",
"WYOMING",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
"Guam ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
" ",
"U.S. Virgin Islands")

```
#---RDDWT_D WILL BE USED AS A WEIGHT (RDDWT_D IS THE DUAL-FRAME WEIGHT EXCLUDING THE U.S. VIRGIN ISLANDS
AND GUAM. USE RDDWTVIGU_D TO INCLUDE U.S. VIRGIN ISLANDS AND GUAM)---#
#---STRATUM WILL BE USED AS A STRATUM VARIABLE FOR VARIANCE ESTIMATION ---#
R_FILE <- subset(NISPUF13, select=c(SEQNUMHH, SEQNUMC, STATE,
HAD_CPOX, RDDWT_D, STRATUM))
names(R_FILE) <- c("SEQNUMHH", "SEQNUMC", "STATE", "HAD_CPOX",
"WT", "STRATUM")

#---ASSIGN LABELS---#
R_FILE$HAD_CPOX <- factor(R_FILE$HAD_CPOX, levels=HAD_CPOXlevels,
labels=HAD_CPOXlabels)
R_FILE$STATE <- factor(R_FILE$STATE, levels=STATElevels,
labels=STATElabels)
R_FILE <- na.omit(R_FILE)
summary(R_FILE$HAD_CPOX)

#---SPECIFY A SAMPLING DESIGN AND FORCE WT AS NUMERIC---#
svydsg <- svydesign(id=~SEQNUMHH, strata=~STRATUM, weights=~(as.numeric(WT)),
data=R_FILE)

#---U.S. TOTAL ESTIMATES AND STANDARD ERRORS---#
r_nation <- svymean(~HAD_CPOX, svydsg)
PERCENT_UTD <- round(r_nation*100,2) #CONVERT INTO PERCENT ESTIMATES(MEAN)
SE_UTD <- round(SE(r_nation)*100,2) #CONVERT INTO PERCENT ESTIMATES(SE)
r_nation_est3 <- cbind(PERCENT_UTD, SE_UTD)
prn(r_nation_est3, "PERCENT HAD_CPOX = YES ESTIMATES AT A NATIONWIDE
LEVEL\n")

#---HAD_CPOX = YES ESTIMATES BY STATE---#
r_est3 <- svyby(~HAD_CPOX, ~STATE, svydsg, svymean)
r_est3[,-c(1)] <- round(r_est3[,-c(1)]*100,2) #CONVERT INTO PERCENT ESTIMATES
r_est3 <- subset(r_est3, select=c(1,2,6)) #SELECT ESTIMATES FOR HAD_CPOX=YES
names(r_est3) <- c("STATE", "PERCENT HAD_CPOX=YES", "STANDARD ERROR
HAD_CPOX=Y")
prn(r_est3, 'PERCENT HAD_CPOX ESTIMATES BY STATE')


######################
title <- "PROG_4.R"
#############################################################################
#TABLE OF PUTD4313 BY INCPOV1 BY RACE_K. SAVE % UTD
#ESTIMATES (NOT S.E.'S) FOR USE IN THE PROGRAM GRAPH_4.
#
#THIS PROGRAM WILL PRODUCE ESTIMATES USING R.
#
#R NOTES:
#1. R IS CASE SENSITIVE.
#2. A FILE PATH IS SEPERATED BY SLASH(/)
#############################################################################
library(survey) #TO USE svydesign(), svymean(), and svyby()
library(Hmisc) #TO USE prn()


dd <- "c:/nispuf13" #"path-to-dataset"

out <-"c:/nispuf13" #"path-to-output"



#--- NAME OF R DATASET ---#
in.file <- paste(dd,"/NISPUF13.RData",sep="")
#---READ R DATASET---#
load(in.file)
```

```
#---FORMAT---#
UTD4313levels=c(0,1)
UTD4313labels=c("NOT 4:3:1:3 UTD", "4:3:1:3 UTD")
RACE_PUFlevels=c(1,2,3)
RACE_PUFlabels=c("WHITE ONLY", "BLACK ONLY", "OTHER + MULTIPLE RACE")
INCPOVlevels=c(1,2,3,4)
INCPOVlabels=c("ABOVE POVERTY, > $75K", "ABOVE POVERTY, <= $75K", "BELOW
POVERTY", "UNKNOWN")
#---PROVWT_D WILL BE USED AS A WEIGHT (PROVWT_D IS THE DUAL-FRAME WEIGHT EXCLUDING THE U.S. VIRGIN ISLANDS
AND GUAM. USE PROVWTVIGU_D TO INCLUDE U.S. VIRGIN ISLANDS AND GUAM)---#
#---STRATUM WILL BE USED AS A STRATUM VARIABLE FOR VARIANCE ESTIMATION ---#
R_FILE <- subset(NISPUF13, select=c(SEQNUMHH, SEQNUMC, PUTD4313, RACE_K, INCPOV1, PROVWT_D, STRATUM))
names(R_FILE) <- c("SEQNUMHH", "SEQNUMC", "PUTD4313", "RACE_K", "INCPOV1", "WT", "STRATUM")
#---ASSIGN LABELS---#
R_FILE$PUTD4313 <- factor(R_FILE$PUTD4313, levels=UTD4313levels, labels=UTD4313labels, exclude=NULL)
R_FILE$RACE_K <- factor(R_FILE$RACE_K, levels=RACE_PUFlevels, labels=RACE_PUFlabels, exclude=NULL)
R_FILE$INCPOV1 <- factor(R_FILE$INCPOV1, levels=INCPOVlevels,labels=INCPOVlabels, exclude=NULL)
#---UNWEIGHTED FREQUENCIES---#
unwt_freq <- function(UNWT.VAR){#FUNCTION TO PRINT UNWEIGHTED FREQUENCIES
unwt.tab <- wtd.table(UNWT.VAR, weights= NULL, type='table')
unwtd.freq <- data.frame(cbind(
unwt.tab, round(unwt.tab/sum(unwt.tab)*100,2),
cumsum(unwt.tab), cumsum(round(unwt.tab/sum(unwt.tab)*100,2))))
names(unwtd.freq) <- c("Frequency", "Percent", "Cumulative Frequency", "Cumulative Percent")
unwtd.title <- paste('Table 4A. Q1/2013 - Q4/2013', 'UNWEIGHTED FREQUENCIES', label(UNWT.VAR), sep="\n")
label(unwtd.freq) <- unwtd.title
print(unwtd.freq)
}
unwt_freq(R_FILE$PUTD4313)
unwt_freq(R_FILE$INCPOV1)
unwt_freq(R_FILE$RACE_K)
R_FILE <- na.omit(R_FILE)
#---SPECIFY A SAMPLING DESIGN AND FORCE WT AS NUMERIC---#
svydsg <- svydesign(id=~SEQNUMHH, strata=~STRATUM, weights=~(as.numeric(WT)),
data=R_FILE)
#---PERCENT 4:3:1:3 UP-TO-DATE AND ESTIMATED STANDARD ERRORS---#
r_est4 <- svyby(~PUTD4313, ~RACE_K+INCPOV1, svydsg, svymean)
r_est4[,-c(1,2)] <- round(r_est4[,-c(1,2)]*100,2) #CONVERT INTO PERCENT
ESTIMATES
r_est4 <- subset(r_est4, select=c(1,2,4,6)) #SELECT ESTIMATES FOR UP-TODATE CASES
names(r_est4) <- c("RACE", "INCOME", "PERCENT_UTD", "STANDARD_ERROR_UTD")
title <- "Table 4B. Q1/2013 - Q4/2013, Percent 4:3:1:3 UTD and Estimated Standard Errors"
prn(r_est4, title)
#---SAVE PERCENT UP-TO-DATE ESTIMATES FOR USE IN THE PROGRAM GRAPH_4---#
r_est4 <- subset(r_est4, select=c(RACE, INCOME, PERCENT_UTD))
save(r_est4, file=paste(out, "/r_est4_13", sep=""))



######################
title <- "GRAPH_4.R"
#############################################################################
#THIS PROGRAM BUILDS OFF OF THE PROGRAM PROG_4. IT PRODUCES A CHART OF
#PUTD4313 BY INCPOV1 BY RACE_K. IT CREATES A BAR CHART IN R GRAPH FOR
#THE 4X3 = 12 CELLS.
#R NOTES:
#1. R IS CASE SENSITIVE.
#2. A FILE PATH IS SEPERATED BY SLASH(/)
#############################################################################
library(survey) #TO USE svydesign(), svymean(), and svyby()
library(Hmisc) #TO USE prn()

dd <- "c:/nispuf13" #---SPECIFY PATH TO R DATASET THAT WAS THE OUTPUT OF R_PROG_4---#
```

```
out <- "c:/nispuf13" #---SPECIFY THE PATH FOR WHERE YOU WANT THE CHART OUTPUT TO GO---#


#---NAME OF R DATASET OUTPUT FROM R_PROG_4---#
in.file <- paste(dd,"/r_est4_13",sep="")
#---READ R DATASET---#
load(in.file)
#---BARCHART---#
#NOTE:R DOES NOT SUPPORT CREATING A HTML FILE CONTAINING A BARCHART#
#CREATE A DATA MATRIX FOR DRAWING A BARCHART#
utd4313 <- matrix(r_est4$PERCENT_UTD, nrow=3, ncol=4, byrow=F, dimnames=list(levels(r_est4$RACE), levels(r_est4$INCOME)))
#CREATE GRAPH_4.GIF#
barplot(utd4313, beside=TRUE, space=c(0.2,1),
col = c("wheat", "lightpink2", "forestgreen"),
axis.lty = 1,
sub="(Graph 4 using 'R')", cex.sub=1, ylim=c(0,120),
xlab="Poverty Status",
ylab="4:3:1:3 Up-To-Date (%)", cex=1, cex.names=1, border=NA)
legend("top", rownames(utd4313), col=c("wheat", "lightpink2",
"forestgreen"), title="Race of Child", pch=15, cex=1)
title1 <- "Percentage of Children Up-to-date with Vaccine Series 4:3:1:3 \n"
title2 <- "by Race and Poverty Status, National Immunization Survey, 2013\n"
mtext(paste(title1,title2), cex=1.3)
```


Percentage of Children Up-to-date with Vaccine Series 4:3:1:3
by Race and Poverty Status, National Immunization Survey, 2013
Race of Child
WHITE ONLY
BLACK ONLY
OTHER + MULTIPLE RACE
4:3:1:3 Up-To-Date (%)
0
20
40
60
80
100
120
ABOVE POVERTY, > $75K
BELOW POVERTY
UNKNOWN
Poverty Status
(Graph 4 using 'R')

Appendix E: Alphabetical Listing of Variables that are in the 2004-2013 Public-Use Data Files

Table E.1 Alphabetical Listing of Variables that are in the 2004-2013 Public-Use Data Files[1]

		Year of Data Collection										
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
Variable Name	**Variable Label[2]**		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces IAGECPXR starting 2005. This version is not imputed.
AGEGRP	AGE CATEGORY OF CHILD (19-23, 24-29, 30-35 MO) (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ALL4SHOT	HH REPORT OF 4:3:1:3 UP-TO-DATE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
BF_ENDR	DURATION OF BREAST FEEDING IN DAYS (TOPCODE)	Y	Y									Dropped starting in 2006 because of question wording change. Replaced by BF_ENDR06.
BF_ENDR06	DURATION OF BREAST FEEDING IN DAYS (RECODE)			Y	Y	Y	Y	Y	Y	Y	Y	Replaces BF_ENDR starting 2006.
BF_EXCLR	DURATION OF EXCLUSIVE BREAST FEEDING IN DAYS (TOPCODE)	Y	Y									Dropped starting in 2006 because of question wording change. Replaced by BF_EXCLR06.
BF_EXCLR06	DURATION OF EXCLUSIVE BREAST/FORMULA FEEDING IN DAYS (RECODE)			Y	Y	Y	Y	Y	Y	Y	Y	Replaces BF_EXCLR starting 2006.
BF_FORMR06	AGE IN DAYS WHEN CHILD FIRST FED FORMULA (TOPCODE)			Y	Y							Question CBF_03_X added starting 2006. Replaced by BF_FORMR06 starting 2008.
BF_FORMR08	AGE IN DAYS WHEN CHILD FIRST FED FORMULA (RECODE)					Y	Y	Y	Y	Y	Y	Replaces BF_FORMR06 to add a "never fed formula" code.
BFENDFL	DURATION OF BREAST FEEDING EXCEEDS CHILD AGE IN DAYS, WITH BUFFER	Y	Y									Dropped starting in 2006 because of question wording change. Replaced by BFENDFL06.
BFENDFL06	DURATION OF BREAST FEEDING EXCEEDS CHILD AGE IN DAYS, WITH BUFFER			Y	Y	Y	Y	Y	Y	Y	Y	Replaces BFENDFL starting 2006.
BFEXCLFL	DURATION OF EXCLUSIVE BREAST FEEDING EXCEEDS TOTAL BREASTFEEDING, WITH BUFFER	Y	Y									Dropped starting in 2006 because question wording change does not allow it to be derived.
BFFORMFL06	AGE IN DAYS WHEN CHILD FIRST FED FORMULA EXCEEDS CHILD AGE IN DAYS, WITH BUFFER			Y	Y	Y	Y	Y	Y	Y	Y	Question CBF_03_X added starting 2006.
C_431	HH REPORT OF 4:3:1 UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_4313	HH REPORT OF 4:3:1:3 UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_DTP	HH REPORT OF 4+ DT-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
C_HEP	HH REPORT OF 3+ HEPATITIS B-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_HIB	HH REPORT OF 3+ HIB-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_MMR	HH REPORT OF 1+ MEASLES-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_POL	HH REPORT OF 3+ POLIO-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C_VRC	HH REPORT OF 1+ VARICELLA-CONTAINING UP-TO-DATE BY SHOT CARD USE	Y	Y									Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
C1R	NUMBER OF PEOPLE IN HOUSEHOLD (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
C5R	RELATIONSHIP OF RESPONDENT TO CHILD (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CBF_01	WAS CHILD EVER BREAST FED OR FED BREAST MILK?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CEN_REG	CENSUS REGION BASED ON TRUE STATE OF RESIDENCE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CHILDNM	NUMBER OF CHILDREN LESS THAN 18 YEARS IN HH (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CWIC_01	CHILD EVER RECEIVED WIC BENEFITS?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CWIC_02	CHILD CURRENTLY RECEIVING WIC BENEFITS?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
D6R	NUMBER OF VACCINATION PROVIDERS IDENTIFIED BY RESPONDENT (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
D7	CONSENT TO OBTAIN CHILD'S IMMUNIZATION RECORDS FROM PROVIDERS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP1	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP2	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP3	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP4	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP5	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP6	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP7	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DDTP8	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DDTP9	AGE IN DAYS OF PROV-REPTD DT-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DFLU1	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU2	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU3	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU4	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU5	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU6	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU7	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU8	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DFLU9	AGE IN DAYS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DH1N1	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #1**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N2	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #2**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N3	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #3**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N4	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #4**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N5	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #5**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DH1N6	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #6**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N7	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #7**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N8	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #8**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DH1N9	**AGE IN DAYS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #9**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
DHEPA1	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA2	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA3	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA4	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA5	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA6	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA7	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA8	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPA9	AGE IN DAYS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DHEPB1	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB2	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB3	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB4	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB5	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB6	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB7	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHEPB8	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DHEPB9	AGE IN DAYS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DHIB1	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB2	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB3	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB4	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB5	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB6	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB7	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB8	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DHIB9	AGE IN DAYS OF PROV-REPTD HIB-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DISPCODE	NIS PROVIDER RECORD-CHECK DISPOSITION CODE	Y	Y	Y	Y	Y	Y	Y	Y			Dropped starting in 2012.
DMMR1	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMMR2	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMMR3	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMMR4	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMMR5	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMMR6	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMMR7	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMMR8	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMMR9	AGE IN DAYS OF PROV-REPTD MEASLES-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMP1	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMP2	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMP3	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DMP4	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMP5	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMP6	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMP7	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMP8	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMP9	AGE IN DAYS OF PROV-REPTD MUMPS-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMPRB1	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMPRB2	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMPRB3	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMPRB4	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DMPRB5	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMPRB6	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMPRB7	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMPRB8	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DMPRB9	AGE IN DAYS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DPCV1	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV2	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV3	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV4	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV5	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV6	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV7	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPCV8	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DPCV9	AGE IN DAYS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DPOLIO1	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO2	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO3	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO4	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO5	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO6	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO7	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO8	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DPOLIO9	AGE IN DAYS OF PROV-REPTD POLIO-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DRB1	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB2	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB3	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB4	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB5	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB6	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB7	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB8	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DRB9	AGE IN DAYS OF PROV-REPTD RUBELLA-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DROT1	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT2	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT3	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT4	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DROT5	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT6	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT7	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT8	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DROT9	AGE IN DAYS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DTP_SOUR	SHOT CARD USED FOR DTP REPORTING	Y										Dropped starting in 2005 because this variable is redundant with variable SHOTCARD.
DTP1_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP2_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP3_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP4_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP5_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP6_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP7_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP8_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DTP9_AGE	AGE IN MONTHS OF PROV-REPTD DT-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DVRC1	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DVRC2	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DVRC3	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DVRC4	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
DVRC5	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DVRC6	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DVRC7	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
DVRC8	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
DVRC9	AGE IN DAYS OF PROV-REPTD VARICELLA-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
EDUC1	EDUCATION OF MOTHER CATEGORIES (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ENTRY2	CHILD LIVES IN STATE WITH HEPATITIS B STATE ENTRY LAW FOR DAY CARE/HEAD START (2001-2002 SCHOOL YEAR)	Y										Dropped starting in 2005.
ESTIAP	ESTIMATION IAP AREA OF RESIDENCE		Y									New estimation area variable starting in 2005. Replaced ITRUEIAP.
ESTIAP06	ESTIMATION IAP AREA OF RESIDENCE			Y								New starting 2006 because estimation areas were modified.
ESTIAP07	ESTIMATION AREA OF RESIDENCE				Y							New starting 2007 because estimation areas were modified.
ESTIAP08	ESTIMATION AREA OF RESIDENCE					Y						New starting 2008 because estimation areas were modified.
ESTIAP09	ESTIMATION AREA OF RESIDENCE						Y					New starting 2009 because estimation areas were modified.
ESTIAP10	ESTIMATION AREA OF RESIDENCE							Y				New starting 2010 because estimation areas were modified.
ESTIAP11	ESTIMATION AREA OF RESIDENCE								Y			New starting 2011 because estimation areas were modified.
ESTIAP12	**ESTIMATION AREA OF RESIDENCE**									**Y**		**New starting 2012 because estimation areas were modified.**
ESTIAP13	**ESTIMATION AREA OF RESIDENCE**										**Y**	**New starting 2013 because estimation areas were modified.**
EST_GRANT	AREA OF RESIDENCE ACCORDING TO THE 56 ORIGINAL CORE GRANTEE AREAS									Y	Y	New starting 2012.
FLU1_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU2_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU3_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU4_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU5_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU6_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
FLU7_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU8_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLU9_AGE	AGE IN MONTHS OF PROV-REPTD SEASONAL FLU-CONTAINING VACCINATION #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
FRSTBRN	FIRST BORN STATUS OF CHILD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FUL2_MMR	HOUSEHOLD REPORT OF 1+ MMR AT ANY AGE	Y										Replaced by FULL_MMR starting in 2005.
FULL_CPO	HH REPORT OF 1+ VARICELLA-CONTAINING SHOT AT ANY AGE	Y	Y									Starting 2005, a code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
FULL_DTP	HH REPORT OF 4+ DT-CONTAINING SHOT	Y	Y									Starting 2005, a code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
FULL_HEP	HH REPORT OF 3+ HEPATITIS B-CONTAINING SHOTS	Y	Y									Starting 2005, a code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
FULL_HIB	HH REPORT OF 3+ HIB-CONTAINING SHOTS	Y	Y									Starting 2005, a code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
FULL_MMR	HH REPORT OF 1+ MEASLES-CONTAINING SHOT AT ANY AGE		Y									Replaced FUL2_MMR starting in 2005. A code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
FULL_POL	HH REPORT OF 3+ POLIO-CONTAINING SHOTS	Y	Y									Starting 2005, a code of 88 added for children with unknown UTD status. Dropped starting in 2006 because no longer possible to derive due to shortened Section B.
H1N1_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #1**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N2_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #2**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N3_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #3**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
H1N4_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #4**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N5_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #5**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N6_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #6**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N7_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #7**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N8_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #8**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
H1N9_AGE	**AGE IN MONTHS OF PROV-REPTD MONOVALENT 2009 H1N1 FLU VACCINATION #9**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
HAD_CPOX	CHILD EVER HAD CHICKEN POX DISEASE?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces I_HADCPX starting in 2005. This version is not imputed.
HEA1_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA2_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA3_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA4_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA5_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA6_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA7_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA8_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEA9_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS A-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
HEP_BRTH	HEPATITIS B-CONTAINING SHOT GIVEN AT BIRTH FLAG	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP_FLAG	HEPATITIS B BIRTH SHOT DATE IMPUTATION FLAG	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP1_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP2_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
HEP3_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP4_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP5_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP6_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP7_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP8_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HEP9_AGE	AGE IN MONTHS OF PROV-REPTD HEPATITIS B-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
HH_DTP	HH REPORT OF NUMBER OF DT-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HH_FLU	HH REPORT OF NUMBER OF SEASONAL FLU VACCINATIONS RECEIVED IN THE 12 MONTHS PRIOR TO INTERVIEW				Y	Y		Y				FLU questions added to the HH questionnaire starting in 2007. Dropped in 2009 due to mid-year questionnaire changes. Reinstated in 2010. Dropped again in 2011 due to mid-year questionnaire changes.
HH_H1N	HH REPORT OF NUMBER OF MONOVALENT 2009 H1N1 FLU VACCINATIONS RECEIVED IN THE 12 MONTHS PRIOR TO INTERVIEW							Y				H1N1 flu questions added to the HH questionnaire starting in 2009. Introduced in the PUF in 2010. Dropped in 2011 due to mid-year questionnaire changes.
HH_HEPB	HH REPORT OF NUMBER OF HEPATITIS B-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HH_HIB	HH REPORT OF NUMBER OF HIB-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HH_MCV	HH REPORT OF NUMBER OF MEASLES-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HH_POL	HH REPORT OF NUMBER OF POLIO-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HH_VRC	HH REPORT OF NUMBER OF VARICELLA-CONTAINING SHOTS RECEIVED			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
HIB1_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB2_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB3_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
HIB4_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB5_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB6_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB7_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB8_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
HIB9_AGE	AGE IN MONTHS OF PROV-REPTD HIB-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
HUTD4313	HOUSEHOLD REPORT OF 4:3:1:3 UTD (UP-TO-DATE)	Y										Dropped starting in 2005 because this variable is redundant with variable ALL4SHOT.
I_HADCPX	DID CHILD EVER HAVE CHICKEN POX?	Y										Replaced by HAD_CPOX starting in 2005.
I_HISP_K	HISPANIC ORIGIN OF CHILD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
IAGECPXR	AGE IN MONTHS WHEN CHILD HAD CHICKEN POX (RECODE)	Y										Replaced by AGECPOXR starting in 2005.
INCPORAR	INCOME TO POVERTY RATIO (RECODE)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces INCPORAT starting 2005. INCPORAT used categories whereas INCPORAR is continuous. INCPORAR has been top- and bottom-coded.
INCPORAT	INCOME TO POVERTY RATIO	Y										Replaced by INCPORAR starting in 2005.
INCPOV1	POVERTY STATUS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces INCPOV1R starting in 2005. INCPOV1R used two categories whereas INCPOV1 uses three.
INCPOV1R	POVERTY STATUS (RECODE)	Y										Replaced by INCPOV1 starting in 2005.
INCQ298A	FAMILY INCOME CATEGORIES (RECODE)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces INCQ298R starting in 2005. INCQ298A uses different categories than were used by INCQ298R.
INCQ298R	FAMILY INCOME CATEGORIES (RECODE)	Y										Replaced by INCQ298A starting in 2005.
INOPHONR	LENGTH OF INTERRUPTION IN TELEPHONE SERVICE IN DAYS (RECODE)	Y	Y	Y	Y	Y	Y					Removed in 2010 due to questionnaire change.
INS_1	IS CHILD COVERED BY HEALTH INSURANCE PROVIDED THROUGH EMPLOYER OR UNION?				Y	Y	Y	Y	Y	Y	Y	
INS_11	ANY TIME WHEN CHILD WAS NOT COVERED BY ANY HEALTH INSURANCE?				Y	Y	Y	Y	Y	Y	Y	
INS_2	IS CHILD COVERED BY ANY MEDICAID PLAN?				Y	Y	Y	Y	Y	Y	Y	
INS_3	IS CHILD COVERED BY S-CHIP?				Y	Y	Y	Y	Y	Y	Y	
INS_3A	IS CHILD COVERED BY ANY MEDICAID PLAN OR S-CHIP?				Y	Y	Y	Y	Y	Y	Y	
INS_4	IS CHILD COVERED BY INDIAN HEALTH SERVICE?				Y	Y						Replaced by INS_4_5 starting 2009.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
INS_4_5	IS CHILD COVERED BY INDIAN HEALTH SERVICE, MILITARY HEALTH CARE, TRICARE, CHAMPUS, OR CHAMP-VA?						Y	Y	Y	Y	Y	Replaces INS_4 and INS_5 starting 2009.
INS_5	IS CHILD COVERED BY MILITARY HEALTH CARE, TRICARE, CHAMPUS, OR CHAMP-VA?				Y	Y						Replaced by INS_4_5 starting 2009.
INS_6	IS CHILD COVERED BY ANY OTHER HEALTH INSURANCE OR HEALTH CARE PLAN?				Y	Y	Y	Y	Y	Y	Y	
INTRP	PHONE INTERRUPTION OF 7 DAYS OR MORE IN PAST YEAR?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ITRUEIAP	IAP AREA OF CURRENT RESIDENCE	Y										The new estimation area variable starting in 2005 is ESTIAP.
LANGUAGE	LANGUAGE IN WHICH INTERVIEW WAS CONDUCTED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
M_AGEGRP	AGE OF MOTHER CATEGORIES (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MARITAL	MARITAL STATUS OF MOTHER CATEGORIES (RECODE)	Y	Y	Y	Y	Y						Replaced by MARITAL2 starting 2009.
MARITAL2	MARITAL STATUS OF MOTHER (RECODE)						Y	Y	Y	Y	Y	Replaces MARITAL starting 2009.
MMR1_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MMR2_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MMR3_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MMR4_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MMR5_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MMR6_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MMR7_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MMR8_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MMR9_AGE	AGE IN MONTHS OF PROV-REPTD MEASLES-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MOBIL	GEOGRAPHIC MOBILITY STATUS: STATE OF RESIDENCE OF CHILD AT BIRTH VERSUS CURRENT STATE	Y										Replaced by MOBIL_I starting in 2005.
MOBIL_I	GEOGRAPHIC MOBILITY STATUS: STATE OF RESIDENCE OF CHILD AT BIRTH VERSUS CURRENT STATE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Replaces MOBIL starting in 2005. This version is imputed.
MP1_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
MP2_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MP3_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MP4_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MP5_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MP6_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MP7_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MP8_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MP9_AGE	AGE IN MONTHS OF PROV-REPTD MUMPS-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MPR1_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MPR2_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MPR3_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MPR4_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
MPR5_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MPR6_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MPR7_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MPR8_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
MPR9_AGE	AGE IN MONTHS OF PROV-REPTD (MUMPS/RUBELLA)-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
N_PRVR	NUMBER OF PROVIDERS RESPONDING WITH VACCINATION DATA FOR CHILD (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
NUM_CELLS _PARENTS	NUMBER OF WORKING CELL PHONES USUALLY USED BY PARENTS OR GUARDIANS						Y	Y	Y	Y	Y	
NUM_CELLS_HH	NUMBER OF WORKING CELL PHONES HOUSEHOLD MEMBERS HAVE AVAILABLE FOR PERSONAL USE						Y	Y	Y	Y	Y	
NUM_PHONE	NUMBER OF RESIDENTIAL TELEPHONE NUMBERS IN HOUSEHOLD (EXCLUDING CELL PHONES)						Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUHEPX	NUMBER OF HEPATITIS B-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUHIBX	NUMBER OF HIB-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUHPHB	NUMBER OF HEPATITIS B/HIB COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUM1L	**NUMBER OF MONOVALENT 2009 H1N1 FLU VACCINATIONS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
P_NUM1M	**NUMBER OF MONOVALENT 2009 H1N1 FLU SPRAY VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
P_NUM1N	**NUMBER OF INJECTED MONOVALENT 2009 H1N1 FLU VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
P_NUMDAH	NUMBER OF DTAP/HIB COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMDHB	NUMBER OF DTP/HIB CONTAINING SHOTS DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y						Dropped in 2009 due to change to IHQ shotgrid.
P_NUMDHI	NUMBER OF DTAP/HEPB/IPV COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMDHM	NUMBER OF DTP/HIB COMBO SHOTS DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y						Dropped in 2009 due to change to IHQ shotgrid.
P_NUMDIH	NUMBER OF DTAP/IPV/HIB COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to change to IHQ shotgrid.
P_NUMDTA	NUMBER OF DTAP-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMDTM	NUMBER OF DT-ONLY SHOTS DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y						Dropped in 2009 due to change to IHQ shotgrid.
P_NUMDTP	NUMBER OF DT-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMFLU	NUMBER OF SEASONAL FLU-CONTAINING VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMFLUL	NUMBER OF SEASONAL FLU-CONTAINING VACCINATIONS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
P_NUMFLUM	NUMBER OF SEASONAL FLU SPRAY VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
P_NUMFLUN	NUMBER OF INJECTED SEASONAL FLU VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMH1N	**NUMBER OF MONOVALENT 2009 H1N1 FLU VACCINATIONS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
P_NUMH2	NUMBER OF HIB-SANOFI or HIB-GLAXOSMITHKLINE SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y					Added in 2009 due to change to IHQ shotgrid. Replaced in 2010 by P_NUMHG and P_NUMHS.
P_NUMHEA	NUMBER OF HEPATITIS A-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMHEN	NUMBER OF HEPATITIS B-CONTAINING SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMHEP	NUMBER OF HEPATITIS B-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMHG	NUMBER OF HIB-GLAXOSMITHKLINE SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_NUMHIB	NUMBER OF HIB-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMHIN	NUMBER OF HIB-CONTAINING SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMHION	NUMBER OF HIB-ONLY SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to change to IHQ shotgrid.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMHM	NUMBER OF HIB-MERCK SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to change to IHQ shotgrid.
P_NUMHS	NUMBER OF HIB-SANOFI SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_NUMIPV	NUMBER OF IPV-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMCN	NUMBER OF MEASLES-CONTAINING SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMMR	NUMBER OF MEASLES-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMMRX	NUMBER OF MMR-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMMX	NUMBER OF MMR-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMP	NUMBER OF MUMPS-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMPR	NUMBER OF (MUMPS/RUBELLA)-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMMRV	NUMBER OF MMR/VARICELLA COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMS	NUMBER OF MEASLES-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMSM	NUMBER OF MEASLES/MUMPS COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMMSR	NUMBER OF MEASLES/RUBELLA COMBO SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMOLN	NUMBER OF POLIO SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMOPV	NUMBER OF OPV-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMPCC	NUMBER OF PCV CONJUGATE SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMPCC13	NUMBER OF PNEUMOCOCCAL CONJUGATE-13 SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_NUMPCC7	NUMBER OF PNEUMOCOCCAL CONJUGATE-7 SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMPCCN	NUMBER OF PNEUMOCOCCAL CONJUGATE SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_NUMPCN	NUMBER OF PCV SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMPCP	NUMBER OF PCV POLYSACCHARIDE SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMPCV	NUMBER OF PNEUMOCOCCAL-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMPOL	NUMBER OF POLIO-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMRB	NUMBER OF RUBELLA-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMRG	NUMBER OF ROTARIX-GSK SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Starting in 2009, rotavirus type boxes were added to the IHQ shot grid.
P_NUMRM	NUMBER OF ROTATEQ-MERCK SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Starting in 2009, rotavirus type boxes were added to the IHQ shot grid.
P_NUMRO	NUMBER OF ROTAVIRUS SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Starting in 2009, rotavirus type boxes were added to the IHQ shot grid.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_NUMROT	NUMBER OF ROTAVIRUS-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMTPM	NUMBER OF DTP-ONLY SHOTS DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y						Dropped in 2009 due to change to IHQ shotgrid.
P_NUMTPN	NUMBER OF DT-CONTAINING SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMVRC	NUMBER OF VARICELLA-CONTAINING SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMVRN	NUMBER OF VARICELLA-CONTAINING SHOTS OF UNKNOWN TYPE BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_NUMVRX	NUMBER OF VARICELLA-ONLY SHOTS BY 36 MONTHS OF AGE DETERMINED FROM PROVIDER INFO, EXCLUDING ANY VACCINATIONS AFTER THE HH INTERVIEW DATE.			Y	Y	Y	Y	Y	Y	Y	Y	
P_U12VRC	UTD (UP-TO-DATE) FLAG FOR PROVIDER 1+ VARICELLA-CONTAINING SHOT AT 12+ MONTHS, BY 36 MONTHS OF AGE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTD331	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3:3:1 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTD431	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTD431H_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1:3* BY 36 MONTHS OF AGE, USING THE ROUTINE, STRICT DEFINITION OF HIB UTD, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_UTD431H3_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1:3*:3 BY 36 MONTHS OF AGE, USING THE ROUTINE, STRICT DEFINITION OF HIB UTD, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTD431H31_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1:3*:3:1 BY 36 MONTHS OF AGE (INCLUDES 1+ VARICELLA-CONTAINING AT AGE 12+ MTHS) USING THE ROUTINE, STRICT DEFINITION OF HIB UTD, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTD431H313_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1:3*:3:1:3 BY 36 MONTHS OF AGE (INCLUDES 1+ VARICELLA-CONTAINING AT AGE 12+ MTHS) USING THE ROUTINE, STRICT DEFINITION OF HIB UTD, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTD431H314_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4:3:1:3*:3:1:4 BY 36 MONTHS OF AGE (INCLUDES 1+ VARICELLA-CONTAINING AT AGE 12+ MTHS) USING THE ROUTINE, STRICT DEFINITION OF HIB UTD, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTDFL1	UTD FLAG FOR PROVIDER SEASONAL INFLUENZA VARIABLE 1 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDFL2	UTD FLAG FOR PROVIDER SEASONAL INFLUENZA VARIABLE 2 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDFL3	UTD FLAG FOR PROVIDER SEASONAL INFLUENZA VARIABLE 3 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.				Y	Y	Y	Y	Y	Y	Y	
P_UTDH1N_1	**UTD (UP-TO-DATE) FLAG FOR PROVIDER 1+ MONOVALENT 2009 H1N1 FLU VACCINATION BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE AND EXCLUDING VACCINATIONS GIVEN PRIOR TO 10/5/2009.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_UTDH1N_2	**UTD (UP-TO-DATE) FLAG FOR PROVIDER 2+ MONOVALENT 2009 H1N1 FLU VACCINATIONS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE AND EXCLUDING VACCINATIONS GIVEN PRIOR TO 10/5/2009.**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
P_UTDHEP	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ HEPATITIS B-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDHEPA1	UTD (UP-TO-DATE) FLAG FOR PROVIDER 1+ HEPATITIS A-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.								Y	Y	Y	Added 2011.
P_UTDHEPA2	UTD (UP-TO-DATE) FLAG FOR PROVIDER 2+ HEPATITIS A-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_UTDHIB	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ HIB-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDHIB_ROUT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ HIB DOSES BY 36 MONTHS OF AGE, BASED ON THE ROUTINE (NON-SHORTAGE) HIB RECOMMENDATIONS AND A STRICT TREATMENT OF HIB SHOTS OF UNKNOWN TYPE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTDHIB_SHORT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ HIB DOSES BY 36 MONTHS OF AGE, BASED ON THE HIB SHORTAGE RECOMMENDATIONS AND A STRICT TREATMENT OF HIB SHOTS OF UNKNOWN TYPE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	Added in 2009 due to new Hib vaccination recommendations.
P_UTDMCV	UTD (UP-TO-DATE) FLAG FOR PROVIDER 1+ MEASLES-CONTAINING SHOT BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
P_UTDMMX	UTD FLAG FOR PROVIDER 1+ MMR COMBO SHOT BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDPC3	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ PNEUMOCOCCAL-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDPCV	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4+ PNEUMOCOCCAL-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDPCVB13	UTD (UP-TO-DATE) INDICATOR FOR PROVIDER 1+ PNEUMOCOCCAL VACCINATIONS OF TYPE CONJUGATE 13, GIVEN 4+ DOSES OF TYPE CONJUGATE 7, BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
P_UTDPOL	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ POLIO-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDROT_S	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ ROTAVIRUS DOSES BY 36 MONTHS OF AGE, BASED ON A STRICT TREATMENT OF ROTAVIRUS VACCINATIONS OF UNKNOWN TYPE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.						Y	Y	Y	Y	Y	
P_UTDTP3	UTD (UP-TO-DATE) FLAG FOR PROVIDER 3+ DT-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
P_UTDTP4	UTD (UP-TO-DATE) FLAG FOR PROVIDER 4+ DT-CONTAINING SHOTS BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV1_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV2_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV3_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
PCV4_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV5_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV6_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV7_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV8_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PCV9_AGE	AGE IN MONTHS OF PROV-REPTD PNEUMOCOCCAL-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
PDAT	CHILD HAS ADEQUATE PROVIDER DATA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL1_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL2_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL3_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL4_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL5_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL6_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL7_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL8_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
POL9_AGE	AGE IN MONTHS OF PROV-REPTD POLIO-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
PROV_FAC	PROVIDER FACILITY TYPES	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PROVWT	WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN (EXCLUDING U.S. VIRGIN ISLANDS)		Y	Y	Y	Y	Y	Y				Removed in 2011 due to additional of dual-frame weights. Replaced by PROVWT_LL.
PROVWT_D	DUAL-FRAME WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN								Y	Y	Y	Added 2011.
PROVWT_LL	LANDLINE-FRAME WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN (EXCLUDING U.S. VIRGIN ISLANDS)								Y			Removed in 2012.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
PROVWTVI	WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN (INCLUDING U.S. VIRGIN ISLANDS)						Y	Y				Removed in 2011 due to additional of dual-frame weights. Replaced by PROVWTVI_LL.
PROVWTVI_D	**COMBINATION OF THE DUAL-FRAME WEIGHT FOR CHILDREN IN THE U.S. PROPER AND LANDLINE WEIGHT FOR CHILDREN IN THE U.S. VIRGIN ISLANDS FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN**									**Y**		**Added 2012. Removed 2013.**
PROVWTVIGU_D	**THE DUAL-FRAME WEIGHT FOR CHILDREN IN THE U.S. PROPER, THE U.S. VIRGIN ISLANDS AND GUAM FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN**										**Y**	**Added 2013.**
PROVWTVI_LL	LANDLINE-FRAME WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN (INCLUDING U.S. VIRGIN ISLANDS)								Y			Added 2011. Removed 2012.
PU431_31	UTD FLAG FOR PROVIDER 4:3:1::3:1 (4:3:1:3:3:1 EXCLUDING HIB; INCLUDES 1+ VARICELLA AT AGE 12+ MTHS) BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
PU431_314	UTD FLAG FOR PROVIDER 4:3:1::3:1:4 (4:3:1:3:3:1:4 EXCLUDING HIB; INCLUDES 1+ VARICELLA AT AGE 12+ MTHS) BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.							Y	Y	Y	Y	Introduced in 2010.
PU431331	UTD FLAG FOR PROVIDER 4:3:1:3:3:1 (INCLUDES 1+ VARICELLA AT AGE 12+ MTHS) BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PU4313313	UTD FLAG FOR PROVIDER 4:3:1:3:3:1:3 (INCLUDES 1+ VARICELLA AT AGE 12+ MTHS) BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.				Y	Y	Y	Y	Y	Y	Y	
PU4313314	UTD FLAG FOR PROVIDER 4:3:1:3:3:1:4 (INCLUDES 1+ VARICELLA AT AGE 12+ MTHS) BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.				Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
PUT43133	UTD FLAG FOR PROVIDER 4:3:1:3:3 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
PUTD4313	UTD FLAG FOR PROVIDER 4:3:1:3 BY 36 MONTHS OF AGE, EXCLUDING ANY VACCINATIONS AFTER THE HOUSEHOLD INTERVIEW DATE.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Q5WEB1	INTEREST IN IHQ ON WEBSITE PROVIDER #1	Y										Question was not asked starting in 2005.
Q5WEB2	INTEREST IN IHQ ON WEBSITE PROVIDER #2	Y										Question was not asked starting in 2005.
Q5WEB3	INTEREST IN IHQ ON WEBSITE PROVIDER #3	Y										Question was not asked starting in 2005.
Q5WEB4	INTEREST IN IHQ ON WEBSITE PROVIDER #4	Y										Question was not asked starting in 2005.
Q5WEB5	INTEREST IN IHQ ON WEBSITE PROVIDER #5	Y										Question was not asked starting in 2005.
RACE_K	RACE OF CHILD (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RACEETHK	RACE/ETHNICITY OF CHILD (RECODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB1_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB2_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB3_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB4_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB5_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB6_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB7_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB8_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RB9_AGE	AGE IN MONTHS OF PROV-REPTD RUBELLA-ONLY SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
RDDWT	HH-PHASE CHILD INTERVIEW WEIGHT (EXCLUDING U.S. VIRGIN ISLANDS)		Y	Y	Y	Y	Y	Y				Removed in 2011 due to additional of dual-frame weights. Replaced by RDDWT_LL.
RDDWT_D	DUAL-FRAME HH-PHASE CHILD INTERIVEW WEIGHT								Y	Y	Y	Added 2011.
RDDWT_LL	LANDLINE-FRAME HH-PHASE CHILD INTERIVEW WEIGHT (EXCLUDING U.S. VIRGIN ISLANDS)								Y			Added 2011. Removed 2012.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
RDDWTVI	HH-PHASE CHILD INTERVIEW WEIGHT (INCLUDING U.S. VIRGIN ISLANDS)						Y	Y				Removed in 2011 due to additional of dual-frame weights. Replaced by RDDWTVI_LL.
RDDWTVI_D	**COMBINATION OF THE DUAL-FRAME HH-PHASE WEIGHT FOR HOUSEHOLDS IN THE U.S. PROPER AND LANDLINE HH-PHASE WEIGHT FOR HOUSEHOLDS IN THE U.S. VIRGIN ISLANDS**									**Y**		**Added 2012. Removed 2013.**
RDDWTVIGU_D	**THE DUAL-FRAME HH-PHASE WEIGHT FOR HOUSEHOLDS IN THE U.S. PROPER, THE U.S. VIRGIN ISLANDS AND GUAM**										**Y**	**Added 2013.**
RDDWTVI_LL	LANDLINE-FRAME HH-PHASE CHILD INTERIVEW WEIGHT (INCLUDING U.S. VIRGIN ISLANDS)								Y			Added 2011. Removed 2012.
REGISTRY	CHILD'S PROVIDERS REPORTED CHILD'S VACCINATIONS TO IMMUNIZATION REGISTRY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RENT_OWN	IS HOME OWNED/BEING BOUGHT, RENTED, OR OCCUPIED BY SOME OTHER ARRANGEMENT?						Y	Y	Y	Y	Y	
ROT1_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT2_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT3_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT4_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT5_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT6_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT7_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT8_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ROT9_AGE	AGE IN MONTHS OF PROV-REPTD ROTAVIRUS-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
SC_431	HH SHOT CARD REPORT OF 4:3:1 UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_4313	HH SHOT CARD REPORT OF 4:3:1:3 UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_43133	HH SHOT CARD REPORT OF 4:3:1:3:3 UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
SC_DTP	HH SHOT CARD REPORT OF 4+ DT-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_HEPB	HH SHOT CARD REPORT OF 3+ HEPATITIS B-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_HIB	HH SHOT CARD REPORT OF 3+ HIB-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_MCV	HH SHOT CARD REPORT OF 1+ MEASLES-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_POL	HH SHOT CARD REPORT OF 3+ POLIO-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SC_VRC	HH SHOT CARD REPORT OF 1+ VARICELLA-CONTAINING UP-TO-DATE			Y	Y	Y	Y	Y	Y			Added in 2006 as a partial replacement for the "FULL" and "C_" variables. Dropped in 2012 due to questionnaire changes.
SEQNUMC	UNIQUE CHILD IDENTIFIER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SEQNUMHH	UNIQUE HOUSEHOLD IDENTIFIER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SEX	GENDER OF CHILD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SHORT	Q1/2004 SHORT QUESTIONNAIRE EXPERIMENT FLAG	Y										There was no short questionnaire experiment in 2005.
SHOTCARD	SHOT CARD USE FLAG	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
STATE	TRUE STATE OF RESIDENCE (STATE FIPS CODE)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
STRATUM	**STRATUM VARIABLE FOR DUAL-FRAME VARIANCE ESTIMATION**									**Y**	**Y**	**Added 2012. Equal to sample frame by estimation area.**
STRATUM_D	STRATUM VARIABLE FOR DUAL-FRAME VARIANCE ESTIMATION								Y			Added 2011. Equal to sample frame by estimation area.
TEL_SAMPFRAME	SAMPLE FRAME INDICATOR								Y			Added 2011. Removed 2012.
U1D_HEP	BIRTH DOSE HEPATITIS B-CONTAINING GIVEN FROM BIRTH TO DAY 1 FLAG								Y	Y	Y	Added 2011.
U2D_HEP	BIRTH DOSE HEPATITIS B-CONTAINING GIVEN FROM BIRTH TO DAY 2 FLAG								Y	Y	Y	Added 2011.
U3D_HEP	BIRTH DOSE HEPATITIS B-CONTAINING GIVEN FROM BIRTH TO DAY 3 FLAG								Y	Y	Y	Added 2011.
VFC_I	DERIVED: IS CHILD VFC ELIGIBLE?						Y	Y	Y			Removed in 2012
VFC_ORDER	DO CHILD'S PROVIDERS ORDER VACCINES FROM STATE/LOCAL HEALTH DEPT?			Y	Y	Y	Y	Y	Y	Y	Y	
VFC_PRO	PARTICIPATION OF CHILD'S PROVIDERS IN VACCINES FOR CHILDREN PROGRAM	Y	Y									Question was not asked starting in 2006.
VRC1_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
VRC2_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
VRC3_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
VRC4_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
VRC5_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
VRC6_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #6		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
VRC7_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #7		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
VRC8_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #8		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
VRC9_AGE	AGE IN MONTHS OF PROV-REPTD VARICELLA-CONTAINING SHOT #9		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
WGT	NEW WEIGHT FOR CHILDREN WITH ADEQUATE PROVIDER DATA AND UNVACCINATED CHILDREN	Y										Replaced by PROVWT starting in 2005.
WGT_RDD	RDD CHILD INTERVIEW WEIGHT	Y										Replaced by RDDWT starting in 2005.
XDTPTY1	DT-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY2	DT-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY3	DT-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY4	DT-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY5	DT-CONTAINING VACCINATION #5 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY6	DT-CONTAINING VACCINATION #6 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY7	DT-CONTAINING VACCINATION #7 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY8	DT-CONTAINING VACCINATION #8 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XDTPTY9	DT-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XFLUTY1	SEASONAL FLU-CONTAINING VACCINATION #1 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY2	SEASONAL FLU-CONTAINING VACCINATION #2 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY3	SEASONAL FLU-CONTAINING VACCINATION #3 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY4	SEASONAL FLU-CONTAINING VACCINATION #4 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
XFLUTY5	SEASONAL FLU-CONTAINING VACCINATION #5 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY6	SEASONAL FLU-CONTAINING VACCINATION #6 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY7	SEASONAL FLU-CONTAINING VACCINATION #7 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY8	SEASONAL FLU-CONTAINING VACCINATION #8 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XFLUTY9	SEASONAL FLU-CONTAINING VACCINATION #9 TYPE CODE					Y	Y	Y	Y	Y	Y	Starting in 2008, influenza type boxes were added to the IHQ shot grid.
XH1NTY1	**MONOVALENT 2009 H1N1 FLU VACCINATION #1 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY2	**MONOVALENT 2009 H1N1 FLU VACCINATION #2 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY3	**MONOVALENT 2009 H1N1 FLU VACCINATION #3 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY4	**MONOVALENT 2009 H1N1 FLU VACCINATION #4 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY5	**MONOVALENT 2009 H1N1 FLU VACCINATION #5 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY6	**MONOVALENT 2009 H1N1 FLU VACCINATION #6 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY7	**MONOVALENT 2009 H1N1 FLU VACCINATION #7 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY8	**MONOVALENT 2009 H1N1 FLU VACCINATION #8 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XH1NTY9	**MONOVALENT 2009 H1N1 FLU VACCINATION #9 TYPE CODE**							**Y**	**Y**	**Y**		**Introduced in 2010. Removed 2013.**
XHEPTY1	HEPATITIS B-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY2	HEPATITIS B-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY3	HEPATITIS B-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY4	HEPATITIS B-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY5	HEPATITIS B-CONTAINING VACCINATION #5 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY6	HEPATITIS B-CONTAINING VACCINATION #6 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY7	HEPATITIS B-CONTAINING VACCINATION #7 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY8	HEPATITIS B-CONTAINING VACCINATION #8 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHEPTY9	HEPATITIS B-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
XHIBTY1	HIB-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY2	HIB-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY3	HIB-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY4	HIB-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY5	HIB-CONTAINING VACCINATION #5 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY6	HIB-CONTAINING VACCINATION #6 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY7	HIB-CONTAINING VACCINATION #7 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY8	HIB-CONTAINING VACCINATION #8 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XHIBTY9	HIB-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XMMRTY1	MEASLES-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XMMRTY2	MEASLES-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XMMRTY3	MEASLES-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XMMRTY4	MEASLES-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XMMRTY5	MEASLES-CONTAINING VACCINATION #5 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XMMRTY6	MEASLES-CONTAINING VACCINATION #6 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XMMRTY7	MEASLES-CONTAINING VACCINATION #7 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XMMRTY8	MEASLES-CONTAINING VACCINATION #8 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XMMRTY9	MEASLES-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XPCVTY1	PNEUMOCOCCAL-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY2	PNEUMOCOCCAL-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY3	PNEUMOCOCCAL-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY4	PNEUMOCOCCAL-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY5	PNEUMOCOCCAL-CONTAINING VACCINATION #5 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
XPCVTY6	PNEUMOCOCCAL-CONTAINING VACCINATION #6 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY7	PNEUMOCOCCAL-CONTAINING VACCINATION #7 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY8	PNEUMOCOCCAL-CONTAINING VACCINATION #8 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPCVTY9	PNEUMOCOCCAL-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XPOLTY1	POLIO-CONTAINING VACCINATION #1 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY2	POLIO-CONTAINING VACCINATION #2 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY3	POLIO-CONTAINING VACCINATION #3 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY4	POLIO-CONTAINING VACCINATION #4 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY5	POLIO-CONTAINING VACCINATION #5 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY6	POLIO-CONTAINING VACCINATION #6 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY7	POLIO-CONTAINING VACCINATION #7 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY8	POLIO-CONTAINING VACCINATION #8 TYPE CODE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
XPOLTY9	POLIO-CONTAINING VACCINATION #9 TYPE CODE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Starting in 2005, nine shot variables are included for each vaccine category.
XROTTY1	ROTAVIRUS-CONTAINING VACCINATION #1 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY2	ROTAVIRUS-CONTAINING VACCINATION #2 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY3	ROTAVIRUS-CONTAINING VACCINATION #3 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY4	ROTAVIRUS-CONTAINING VACCINATION #4 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY5	ROTAVIRUS-CONTAINING VACCINATION #5 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY6	ROTAVIRUS-CONTAINING VACCINATION #6 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY7	ROTAVIRUS-CONTAINING VACCINATION #7 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY8	ROTAVIRUS-CONTAINING VACCINATION #8 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XROTTY9	ROTAVIRUS-CONTAINING VACCINATION #9 TYPE CODE						Y	Y	Y	Y	Y	Rotavirus vaccination types were added to the IHQ starting 2009.
XVRCTY1	VARICELLA-CONTAINING VACCINATION #1 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Notes[3]
XVRCTY2	VARICELLA-CONTAINING VACCINATION #2 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY3	VARICELLA-CONTAINING VACCINATION #3 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY4	VARICELLA-CONTAINING VACCINATION #4 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY5	VARICELLA-CONTAINING VACCINATION #5 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY6	VARICELLA-CONTAINING VACCINATION #6 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY7	VARICELLA-CONTAINING VACCINATION #7 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY8	VARICELLA-CONTAINING VACCINATION #8 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
XVRCTY9	VARICELLA-CONTAINING VACCINATION #9 TYPE CODE			Y	Y	Y	Y	Y	Y	Y	Y	Varicella vaccination types were added to the IHQ starting 2006.
YEAR	YEAR OF INTERVIEW	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

[1] For a list of variables that appeared in one or more (but not all) public use files from 1995-2004, see "Alphabetical Listing of Variables that are Not Available in All Public-Use Data Files, National Immunization Survey, 1995-2004": www.cdc.gov/nchs/data/nis/pufvariables1995to2004.pdf

[2] If the variable appeared in the 2012 public-use file, then the 2012 label is given; otherwise the label from the most recent public-use file in which the variable appeared is given.

[3] Starting in 2005, a code of 77 is used for "Don't Know" responses and a code of 99 is used for "Refused" responses.

Appendix F: Summary Tables

Table F.1: Estimated Population Totals and Sample Sizes of Children 19-35 Months of Age by State and Estimation Area, National Immunization Survey, 2013

State/Estimation Area	ESTIAP	Estimated Population Total of Children	Number of Children with Complete Household Interviews	Number of Children with Adequate Provider Data	Percent of Children with Adequate Provider Data
Total U.S.[1]		5,724,087	22,462	13,611	60.6%
Alabama	20	84,627	312	166	53.2%
Alaska	74	13,752	460	299	65.0%
Arizona	66	123,594	441	254	57.6%
Arkansas	46	55,874	319	188	58.9%
California	68	731,918	511	283	55.4%
Colorado	60	96,605	442	267	60.4%
Connecticut	1	56,042	355	213	60.0%
Delaware	13	16,545	385	242	62.9%
District of Columbia	12	11,696	390	223	57.2%
Florida	22	310,138	388	228	58.8%
Georgia	25	191,743	288	178	61.8%
Hawaii	72	26,291	402	243	60.4%
Idaho	75	32,071	345	233	67.5%
Illinois		229,659	839	495	59.0%
IL-City of Chicago	35	59,237	295	168	56.9%
IL-Rest of State	34	170,422	544	327	60.1%
Indiana	36	120,179	418	243	58.1%
Iowa	56	54,441	333	214	64.3%
Kansas	57	57,726	312	205	65.7%
Kentucky	27	77,268	305	190	62.3%
Louisiana	47	89,448	414	224	54.1%
Maine	4	18,068	334	209	62.6%
Maryland	14	106,838	472	287	60.8%
Massachusetts	2	104,130	406	241	59.4%
Michigan	38	162,940	342	212	62.0%
Minnesota	40	100,426	315	195	61.9%
Mississippi	40	57,195	322	180	55.9%
Missouri	61	108,467	310	188	60.6%
Montana		17,205	325	220	67.7%
Nebraska	59	36,626	356	241	67.7%
Nevada	73	52,403	478	298	62.3%
New Hampshire	5	19,232	346	226	65.3%
New Jersey	8	157,367	474	265	55.9%
New Mexico	49	39,405	399	255	63.9%
New York		341,428	884	468	52.9%
NY-City of New York	11	170,838	480	242	50.4%
NY-Rest of State	10	170,589	404	226	55.9%

State/Estimation Area	ESTIAP	Estimated Population Total of Children	Number of Children with Complete Household Interviews	Number of Children with Adequate Provider Data	Percent of Children with Adequate Provider Data
North Carolina	29	177,251	430	262	60.9%
North Dakota	62	13,504	502	303	60.4%
Ohio	41	195,908	420	249	59.3%
Oklahoma	50	75,705	478	301	63.0%
Oregon	76	65,631	393	275	70.0%
Pennsylvania		208,695	1,053	585	55.6%
PA-Philadelphia County	17	34,576	506	267	52.8%
PA-Rest of State	16	174,119	547	318	58.1%
Rhode Island	6	15,766	360	207	57.5%
South Carolina	30	82,620	350	207	59.1%
South Dakota	63	16,346	290	189	65.2%
Tennessee	31	115,715	392	260	66.3%
Texas		558,691	1,705	1,045	61.3%
TX-Bexar County	55	38,417	394	228	57.9%
TX-City of Houston	54	67,751	348	204	58.6%
TX-El Paso County	53	20,870	364	241	66.2%
TX-Rest of State	51	431,653	599	372	62.1%
Utah	64	72,942	372	249	66.9%
Vermont	7	8,293	436	280	64.2%
Virginia	18	150,476	495	274	55.4%
Washington	77	127,818	340	222	65.3%
West Virginia	19	28,465	366	213	58.2%
Wisconsin	44	98,363	341	221	64.8%
Wyoming	65	10,551	317	196	61.8%
U.S. Virgin Islands	95	2,332	397	201	50.6%
Guam	105	4,499	389	248	63.8%

[1]'Total U.S.' excludes the U.S. Virgin Islands and Guam.

Table F.2: Estimated Population Totals and Sample Sizes for Age Group by Maternal Education, National Immunization Survey, 2013

Age Group in Months	Maternal Education	Children with Completed Household Interviews Unweighted Completes	Children with Completed Household Interviews Weighted Completes[2]	Children with Adequate Provider Data Unweighted Completes	Children with Adequate Provider Data Weighted Completes[3]
19-23	<12 Years	716	318,433	479	318,927
19-23	12 Years	1189	460,514	717	466,403
19-23	>12, Non College Graduate	1698	378,712	1057	378,409
19-23	College Grad	2752	558,213	1675	552,132
24-29	<12 Years	720	339,339	474	347,333
24-29	12 Years	1158	479,413	702	461,583
24-29	>12, Non College Graduate	1829	433,474	1143	421,128
24-29	College Grad	3092	690,528	1888	712,709
30-35	<12 Years	999	379,210	642	391,950
30-35	12 Years	1695	551,319	975	541,912
30-35	>12, Non College Graduate	2478	474,310	1458	467,073
30-35	College Grad	4136	660,623	2401	664,527
Total		22,462	5,724,087	13,611	5,724,087

[1] Excludes the U.S. Virgin Islands and Guam.
[2] Weighted by RDDWT_D.
[3] Weighted by PROVWT_D.

Table F.3: Estimated Population Totals and Sample Sizes for Age Group by Poverty Status, National Immunization Survey, 2013

Age Group in Months	Poverty Status	Children with Completed Household Interviews Unweighted Completes	Children with Completed Household Interviews Weighted Completes[2]	Children with Adequate Provider Data Unweighted Completes	Children with Adequate Provider Data Weighted Completes[3]
19-23 Months	Above poverty, > $75K	2,172	444,611	1,371	452,672
19-23 Months	Above poverty, <= $75K	2,312	576,688	1,365	554,754
19-23 Months	Below poverty	1,566	586,951	1,064	594,825
19-23 Months	Unknown	305	107,622	128	113,620
24-29 Months	Above poverty, > $75K	2,396	536,140	1,474	559,005
24-29 Months	Above poverty, <= $75K	2,518	654,127	1,566	663,880
24-29 Months	Below poverty	1,597	649,160	1,054	630,317
24-29 Months	Unknown	288	103,326	113	89,550
30-35 Months	Above poverty, > $75K	3,282	549,410	1,928	552,072
30-35 Months	Above poverty, <= $75K	3,437	698,855	1,985	720,086
30-35 Months	Below poverty	2,178	692,746	1,408	687,805
30-35 Months	Unknown	411	124,451	155	105,500
Total		22,462	5,724,087	13,611	5,724,087

[1] Excludes the U.S. Virgin Islands and Guam.
[2] Weighted by RDDWT_D.
[3] Weighted by PROVWT_D.

Table F.4: Estimated Population Totals and Sample Sizes for Race/Ethnicity by Poverty Status, National Immunization Survey, 2013

Race/Ethnicity[2]	Poverty Status	Children with Completed Household Interviews Unweighted Completes	Children with Completed Household Interviews Weighted Completes[3]	Children with Adequate Provider Data Unweighted Completes	Children with Adequate Provider Data Weighted Completes[4]
Hispanic	Above poverty, > $75K	748	166,907	431	141,343
Hispanic	Above poverty, <= $75K	1,400	441,786	848	455,937
Hispanic	Below poverty	1,951	815,119	1,330	817,447
Hispanic	Unknown	257	132,954	121	142,491
Non-Hispanic White Only	Above poverty, > $75K	5,715	1,044,058	3,563	1,132,547
Non-Hispanic White Only	Above poverty, <= $75K	5,074	1,023,927	3,054	1,004,987
Non-Hispanic White Only	Below poverty	1,746	507,343	1,141	507,776
Non-Hispanic White Only	Unknown	475	117,648	176	96,318
Non-Hispanic Black Only	Above poverty, > $75K	364	75,873	163	63,600
Non-Hispanic Black Only	Above poverty, <= $75K	746	224,951	393	224,367
Non-Hispanic Black Only	Below poverty	958	396,605	587	398,925
Non-Hispanic Black Only	Unknown	137	50,427	49	37,570
Non-Hispanic Other & Multi-Racial	Above poverty, > $75K	1,023	243,324	616	226,260
Non-Hispanic Other & Multi-Racial	Above poverty, <= $75K	1,047	239,006	621	253,429
Non-Hispanic Other & Multi-Racial	Below poverty	686	209,790	468	188,800
Non-Hispanic Other & Multi-Racial	Unknown	135	34,370	50	32,291
Total		22,462	5,724,087	13,611	5,724,087

[1] Excludes the U.S. Virgin Islands and Guam.
[2] Race/Ethnicity is self-reported and mutually exclusive.
[3] Weighted by RDDWT_D.
[4] Weighted by PROVWT_D.

Table F.5: Estimated Population Totals and Sample Sizes for Age Group by Race/Ethnicity, National Immunization Survey, 2013

Age Group in Months	Race/Ethnicity of Child[2]	Children with Completed Household Interviews Unweighted Completes	Children with Completed Household Interviews Weighted Completes[3]	Children with Adequate Provider Data Unweighted Completes	Children with Adequate Provider Data Weighted Completes[4]
19-23 Months	Hispanic	1,227	468,185	770	466,829
19-23 Months	Non-Hispanic White Only	3,692	811,807	2,289	823,260
19-23 Months	Non-Hispanic Black Only	607	221,960	341	217,895
19-23 Months	Non-Hispanic Other & Multi-Racial	829	213,920	528	207,887
24-29 Months	Hispanic	1,316	516,622	850	520,489
24-29 Months	Non-Hispanic White Only	3,913	900,735	2,426	918,147
24-29 Months	Non-Hispanic Black Only	667	263,928	370	249,626
24-29 Months	Non-Hispanic Other & Multi-Racial	903	261,468	561	254,491
30-35 Months	Hispanic	1,813	571,958	1,110	569,900
30-35 Months	Non-Hispanic White Only	5,405	980,433	3,219	1,000,221
30-35 Months	Non-Hispanic Black Only	931	261,969	481	256,939
30-35 Months	Non-Hispanic Other & Multi-Racial	1,159	251,102	666	238,402
Total		22,462	5,724,087	13,611	5,724,087

[1] Excludes the U.S. Virgin Islands and Guam.
[2] Race/Ethnicity is self-reported and mutually exclusive.
[3] Weighted by RDDWT_D.
[4] Weighted by PROVWT_D.

Table F.6: Estimated Population Totals and Sample Sizes for Age Group by Gender, National Immunization Survey, 2013

Age Group in Months	Gender	Children with Completed Household Interviews Unweighted Completes	Children with Completed Household Interviews Weighted Completes[2]	Children with Adequate Provider Data Unweighted Completes	Children with Adequate Provider Data Weighted Completes[3]
19-23 Months	Male	3,314	872,835	2,044	850,525
19-23 Months	Female	3,041	843,036	1,884	865,347
24-29 Months	Male	3,505	996,816	2,186	1,016,186
24-29 Months	Female	3,294	945,937	2,021	926,567
30-35 Months	Male	4,775	1,061,083	2,787	1,064,024
30-35 Months	Female	4,533	1,004,379	2,689	1,001,438
Total		22,462	5,724,087	13,611	5,724,087

[1] Excludes the U.S. Virgin Islands and Guam.
[2] Weighted by RDDWT_D.
[3] Weighted by PROVWT_D.

Table F.7: Estimated Vaccination Coverage* with Individual Vaccines and Selected Vaccination Series Among Children 19-35 Months of Age by State and Estimation Area, National Immunization Survey Q1/2013-Q4/2013†

	4+DTaP‡	3+Polio§	1+MMR‖	3+Hib**	3+HepB††	1+Var§§	4+PCV¶¶	4:3:1:3*:3:1:4††††
US National	83.1 ± 1.3	92.7 ± 1.0	91.9 ± 0.9	92.8 ± 0.9	90.8 ± 1.0	91.2 ± 0.9	82.0 ± 1.3	72.6 ± 1.5
Alabama	84.0 ± 7.3	93.3 ± 5.2	89.7 ± 5.8	92.4 ± 5.9	89.8 ± 6.1	92.2 ± 5.3	86.9 ± 6.8	78.5 ± 7.6
Alaska	75.5 ± 6.1	92.0 ± 3.6	90.5 ± 3.6	87.8 ± 4.7	92.7 ± 3.4	89.6 ± 3.7	78.2 ± 5.8	67.1 ± 6.6
Arizona	76.6 ± 6.6	91.2 ± 4.3	91.4 ± 3.7	90.0 ± 4.6	88.4 ± 4.6	89.6 ± 4.2	76.8 ± 6.7	66.6 ± 7.7
Arkansas	74.3 ± 8.3	89.4 ± 6.3	88.3 ± 5.9	90.9 ± 4.9	88.6 ± 6.2	87.2 ± 6.3	69.5 ± 8.6	60.6 ± 8.8
California	83.1 ± 6.4	90.5 ± 5.4	90.7 ± 5.3	90.9 ± 5.3	91.1 ± 5.2	90.4 ± 5.3	79.1 ± 7.1	72.6 ± 7.6
Colorado	81.2 ± 6.0	90.3 ± 4.7	86.0 ± 5.5	90.1 ± 4.8	84.1 ± 5.6	84.8 ± 5.6	84.0 ± 5.6	70.3 ± 6.9
Connecticut	88.0 ± 5.9	97.6 ± 2.3	91.4 ± 5.4	97.6 ± 2.3	96.0 ± 2.7	90.8 ± 5.5	91.5 ± 4.5	79.1 ± 6.8
Delaware	87.9 ± 5.0	97.4 ± 2.3	94.8 ± 3.4	97.5 ± 2.3	93.7 ± 3.1	92.3 ± 4.3	88.0 ± 5.0	74.8 ± 6.4
Dist. of Columbia	86.2 ± 5.8	96.1 ± 2.9	96.2 ± 3.1	96.2 ± 3.1	92.5 ± 4.7	95.0 ± 3.6	88.9 ± 5.2	78.9 ± 7.1
Florida	80.3 ± 7.7	91.2 ± 6.1	93.4 ± 4.0	91.1 ± 5.1	89.0 ± 5.3	92.8 ± 4.2	79.1 ± 6.7	70.7 ± 8.7
Georgia	83.5 ± 7.9	91.5 ± 6.0	93.9 ± 4.1	93.5 ± 5.0	91.5 ± 5.5	95.0 ± 3.9	81.3 ± 8.6	72.9 ± 9.5
Hawaii	83.7 ± 6.1	92.6 ± 4.3	92.8 ± 3.8	95.7 ± 3.0	88.3 ± 4.9	91.4 ± 4.5	82.5 ± 6.3	69.1 ± 7.6
Idaho	84.2 ± 5.3	92.6 ± 3.7	91.1 ± 4.3	91.2 ± 4.3	90.7 ± 4.3	87.9 ± 4.8	87.3 ± 4.6	75.2 ± 6.5
Illinois	82.7 ± 4.5	91.2 ± 3.4	91.4 ± 3.1	92.0 ± 3.3	89.5 ± 3.6	88.6 ± 3.7	79.7 ± 4.6	69.3 ± 5.2
IL-City of Chicago	82.0 ± 7.3	91.0 ± 5.3	90.0 ± 5.2	92.1 ± 5.0	87.2 ± 6.1	89.0 ± 5.2	75.8 ± 7.6	65.9 ± 8.5
IL-Rest of State	83.0 ± 5.5	91.3 ± 4.3	91.9 ± 3.8	92.0 ± 4.1	90.3 ± 4.3	88.4 ± 4.7	81.0 ± 5.6	70.5 ± 6.3
Indiana	82.1 ± 5.3	91.9 ± 3.9	92.0 ± 3.6	91.7 ± 4.0	92.0 ± 4.0	90.7 ± 3.8	79.2 ± 6.1	68.9 ± 6.7
Iowa	89.6 ± 4.4	97.5 ± 2.0	94.5 ± 3.9	97.1 ± 2.2	96.5 ± 2.5	93.0 ± 3.6	90.7 ± 4.7	81.9 ± 6.3
Kansas	81.6 ± 6.1	93.2 ± 3.8	89.4 ± 4.7	95.0 ± 3.3	93.8 ± 3.6	89.7 ± 4.7	85.1 ± 5.4	74.0 ± 6.8
Kentucky	84.1 ± 6.4	91.0 ± 5.3	89.5 ± 5.1	90.6 ± 5.3	90.8 ± 5.1	91.5 ± 4.6	81.7 ± 6.9	77.9 ± 7.1
Louisiana	78.5 ± 6.4	91.2 ± 4.7	88.1 ± 5.1	89.8 ± 5.0	93.0 ± 3.9	92.0 ± 4.3	79.7 ± 6.8	72.1 ± 7.3
Maine	87.9 ± 5.7	94.0 ± 3.8	91.0 ± 4.5	92.2 ± 4.4	84.5 ± 5.6	90.5 ± 4.5	84.9 ± 6.0	71.4 ± 7.3
Maryland	87.4 ± 6.5	97.0 ± 3.0	95.3 ± 4.4	95.7 ± 3.4	91.0 ± 5.5	94.2 ± 4.6	85.8 ± 6.8	77.1 ± 8.0
Massachusetts	93.3 ± 4.0	97.9 ± 1.9	95.8 ± 3.6	98.3 ± 1.8	92.9 ± 3.7	94.7 ± 3.7	90.6 ± 5.2	80.2 ± 6.5
Michigan	79.6 ± 6.6	90.8 ± 4.6	89.2 ± 5.1	88.7 ± 5.2	87.9 ± 5.2	87.5 ± 5.3	79.1 ± 6.9	71.1 ± 7.3
Minnesota	90.5 ± 5.0	94.8 ± 3.8	90.8 ± 5.5	95.7 ± 3.6	90.3 ± 5.2	89.2 ± 5.7	90.8 ± 4.7	77.3 ± 7.5
Mississippi	87.4 ± 5.4	94.9 ± 3.7	95.2 ± 3.0	96.6 ± 2.6	92.8 ± 4.1	92.9 ± 4.0	83.4 ± 6.9	76.0 ± 7.6
Missouri	82.1 ± 6.6	91.0 ± 4.7	89.8 ± 5.3	88.9 ± 5.1	88.4 ± 5.0	88.7 ± 5.5	80.4 ± 6.9	70.1 ± 7.7
Montana	79.0 ± 6.4	92.7 ± 3.7	87.3 ± 5.2	89.8 ± 4.7	89.9 ± 4.6	87.1 ± 5.2	76.8 ± 7.5	66.7 ± 8.1
Nebraska	88.3 ± 4.7	95.9 ± 2.4	92.5 ± 4.1	95.7 ± 2.5	94.5 ± 2.8	92.2 ± 4.0	90.7 ± 4.3	81.3 ± 5.5
Nevada	81.1 ± 5.0	92.0 ± 3.4	90.4 ± 3.5	88.1 ± 4.2	88.8 ± 4.2	88.6 ± 3.9	76.4 ± 5.5	65.6 ± 6.1
New Hampshire	91.3 ± 3.9	97.2 ± 2.2	96.3 ± 2.6	95.9 ± 3.0	94.6 ± 3.1	93.0 ± 3.9	89.2 ± 5.1	78.2 ± 6.5
New Jersey	86.4 ± 5.3	91.8 ± 4.5	95.6 ± 3.3	92.8 ± 0.9	93.2 ± 3.6	91.9 ± 4.5	86.6 ± 5.3	73.9 ± 6.7
New Mexico	79.8 ± 6.4	87.6 ± 5.1	89.1 ± 4.6	92.4 ± 5.9	86.0 ± 5.1	86.9 ± 5.0	78.3 ± 6.4	67.7 ± 7.2
New York	86.6 ± 3.8	95.8 ± 2.3	95.5 ± 2.3	87.8 ± 4.7	92.9 ± 3.0	92.9 ± 3.0	86.8 ± 3.7	74.3 ± 4.9
NY-City of New York	86.0 ± 5.3	95.0 ± 3.6	96.8 ± 2.5	90.0 ± 4.6	91.6 ± 4.2	95.2 ± 3.2	81.9 ± 5.7	71.2 ± 6.8
NY-Rest of State	87.2 ± 5.5	96.7 ± 2.9	94.2 ± 3.9	90.9 ± 4.9	94.2 ± 4.3	90.6 ± 5.1	91.8 ± 4.6	77.4 ± 7.1
North Carolina	87.5 ± 5.3	95.9 ± 3.3	96.0 ± 3.3	90.9 ± 5.3	94.3 ± 3.6	94.6 ± 3.7	86.5 ± 5.7	75.6 ± 7.0
North Dakota	78.6 ± 5.9	91.5 ± 3.9	91.4 ± 3.8	90.1 ± 4.8	91.8 ± 3.7	89.8 ± 4.0	81.8 ± 5.4	73.4 ± 6.2
Ohio	75.8 ± 7.0	90.4 ± 5.5	86.0 ± 5.2	97.6 ± 2.3	87.4 ± 5.5	85.3 ± 5.5	71.6 ± 7.3	63.4 ± 7.6

	4+DTaP[‡]	3+Polio[§]	1+MMR[ll]	3+Hib**	3+HepB[††]	1+Var[§§]	4+PCV[¶¶]	4:3:1:3*:3:1:4[††††]
Oklahoma	79.2 ± 5.4	92.1 ± 3.4	89.8 ± 3.8	97.5 ± 2.3	90.9 ± 3.5	88.6 ± 4.1	72.6 ± 5.9	63.9 ± 6.3
Oregon	83.8 ± 5.2	91.0 ± 4.0	89.4 ± 4.4	96.2 ± 3.1	88.7 ± 4.2	87.1 ± 4.7	79.8 ± 5.8	70.7 ± 6.3
Pennsylvania	88.7 ± 3.9	95.0 ± 2.5	93.3 ± 3.2	91.1 ± 5.1	92.3 ± 3.4	93.1 ± 3.2	85.4 ± 4.4	77.4 ± 5.1
PA-Philadelphia County	88.7 ± 4.5	92.9 ± 3.9	95.9 ± 2.7	93.5 ± 5.0	93.7 ± 3.6	97.4 ± 2.0	85.7 ± 5.3	79.8 ± 6.0
PA-Rest of State	88.7 ± 4.5	95.4 ± 2.9	92.8 ± 3.8	95.7 ± 3.0	92.0 ± 4.0	92.2 ± 3.9	85.4 ± 5.2	76.9 ± 6.0
Rhode Island	91.6 ± 4.9	96.9 ± 2.3	95.6 ± 3.3	91.2 ± 4.3	96.7 ± 2.3	97.3 ± 2.2	93.0 ± 4.8	84.5 ± 6.3
South Carolina	77.3 ± 7.5	95.6 ± 3.2	89.2 ± 5.3	92.0 ± 3.3	95.0 ± 3.2	89.1 ± 5.8	79.4 ± 7.1	67.1 ± 8.3
South Dakota	86.5 ± 5.8	93.4 ± 3.7	93.1 ± 4.4	92.1 ± 5.0	92.1 ± 4.6	92.5 ± 4.5	83.6 ± 6.0	75.9 ± 7.4
Tennessee	81.1 ± 6.0	94.9 ± 3.5	92.3 ± 4.4	92.0 ± 4.1	92.2 ± 3.9	92.8 ± 3.9	84.2 ± 5.7	71.4 ± 6.7
Texas	81.5 ± 4.5	91.3 ± 3.3	92.7 ± 2.8	91.7 ± 4.0	89.5 ± 3.3	93.6 ± 2.4	82.8 ± 4.4	74.1 ± 5.0
TX-Bexar County	79.4 ± 6.5	92.6 ± 4.1	93.0 ± 3.7	97.1 ± 2.2	90.8 ± 4.3	92.3 ± 3.9	81.5 ± 6.2	72.4 ± 7.0
TX-City of Houston	85.0 ± 6.3	94.7 ± 3.9	92.4 ± 4.5	95.0 ± 3.3	93.9 ± 4.0	92.7 ± 4.4	85.4 ± 6.3	80.0 ± 6.9
TX-El Paso County	76.7 ± 6.1	88.6 ± 4.8	93.7 ± 3.3	90.6 ± 5.3	87.3 ± 5.0	94.0 ± 3.3	82.3 ± 5.5	71.4 ± 6.5
TX-Rest of State	81.4 ± 5.7	90.7 ± 4.2	92.7 ± 3.5	89.8 ± 5.0	88.8 ± 4.3	93.9 ± 3.0	82.6 ± 5.6	73.5 ± 6.3
Utah	90.3 ± 4.1	95.1 ± 2.8	92.6 ± 3.6	92.2 ± 4.4	89.7 ± 4.3	93.6 ± 3.3	89.6 ± 4.3	78.6 ± 5.9
Vermont	85.8 ± 5.1	95.1 ± 3.1	91.2 ± 4.0	95.7 ± 3.4	92.0 ± 3.6	85.8 ± 4.9	82.4 ± 5.7	69.2 ± 6.5
Virginia	78.8 ± 9.3	95.2 ± 4.2	88.6 ± 7.0	98.3 ± 1.8	90.8 ± 5.6	91.1 ± 5.6	80.3 ± 9.0	71.2 ± 9.8
Washington	79.8 ± 7.0	93.1 ± 4.6	93.5 ± 3.9	88.7 ± 5.2	89.0 ± 5.9	91.7 ± 4.6	81.9 ± 6.5	71.0 ± 7.8
West Virginia	83.4 ± 6.2	90.0 ± 5.3	86.0 ± 5.8	95.7 ± 3.6	85.8 ± 5.9	86.1 ± 5.8	76.4 ± 7.0	69.4 ± 7.5
Wisconsin	84.0 ± 6.1	93.8 ± 3.7	93.2 ± 4.2	96.6 ± 2.6	94.4 ± 3.1	91.9 ± 4.4	82.6 ± 6.3	75.7 ± 6.8
Wyoming	80.9 ± 6.6	90.9 ± 5.1	89.0 ± 5.4	88.9 ± 5.1	88.9 ± 5.5	90.8 ± 5.0	81.0 ± 6.7	70.1 ± 7.7
U.S. Virgin Islands	51.1 ± 8.8	65.0 ± 8.5	59.0 ± 8.7	54.6 ± 7.7	69.8 ± 8.1	61.7 ± 8.6	44.6 ± 8.7	39.7 ± 8.6
Guam	71.5 ± 7.2	84.4 ± 6.2	84.9 ± 5.5	68.3 ± 7.4	84.6 ± 5.7	72.4 ± 7.2	66.7 ± 7.6	50.3 ± 7.9

[*] Estimates presented as point estimate (%) ± 95% Confidence Interval. Estimate=NA (Not Available) if the unweighted sample size for the denominator was < 30, or (CI half width)/Estimate > 0.588, or (CI half width) >10.

[†] Children in the Q1/2013-Q4/2013 National Immunization Survey were born from January 2010 through May 2012

[‡] 4 or more doses of DTaP.

[§] 3 or more doses of any poliovirus vaccine.

[ll] 1 or more doses of measles-mumps-rubella vaccine

[**] 3 or more doses of Haemophilus influenzae type b (Hib) vaccine of any type

[††] 3 or more doses of hepatitis B vaccine.

[§§] 1 or more doses of varicella at or after child's birthday, unadjusted for history of varicella illness.

[¶¶] 4 or more doses of PCV.

[††††] 4:3:1 plus full series Hib vaccine, 3 or more doses of HepB, 1 or more doses of varicella vaccine, and 4 or more doses of PCV.

Appendix G: Trends in NIS Response Rates and Vaccination Coverage Rates, 1995-2013

Table G.1: Key Indicators[1] from Landline Sample Household and Provider Data Collection by Survey Year, National Immunization Survey, 1995-2013[2]

Survey Year	Resolution Rate (%)	Screener Completion Rate (%)	Interview Completion Rate (%)	CASRO Response Rate (%)	Children with Adequate Provider Data (%)
1995	96.5	96.4	93.5	87.1	50.6
1996	94.3	96.8	94.0	85.8	63.4
1997	92.1	97.9	93.8	84.6	69.7
1998	90.4	97.8	93.6	82.7	67.1
1999	88.6	97.0	93.4	80.2	65.4
2000	88.1	96.0	93.1	78.7	67.4
2001	86.8	96.2	91.1	76.1	70.4
2002	84.8	96.6	90.6	74.2	67.6
2003	83.6	94.0	88.7	69.8	68.9
2004	83.8	94.8	92.0	73.1	71.0
2005	83.3	92.8	84.2	65.1	63.6
2006	83.3	90.5	85.6	64.5	70.4
2007	82.9	90.2	86.8	64.9	68.6
2008	82.3	90.3	85.1	63.2	71.0
2009	82.9	92.4	83.2	63.8	68.7
2010	83.3	91.5	83.6	63.8	71.2
2011	83.0	90.7	81.7	61.6	72.3
2012	84.1	90.7	84.6	64.5	67.9
2013	83.2	91.0	82.3	62.3	63.5

[1] For the definition of the key indicators see Table 1 of NIS Data User's Guide for the survey year of interest.
[2] Excludes the U.S. Virgin Islands and Guam.

Figure G.1: Trends in Landline Key Indicators from Household and Provider Data Collection by Survey Year, National Immunization Survey, 1995-2013[1]

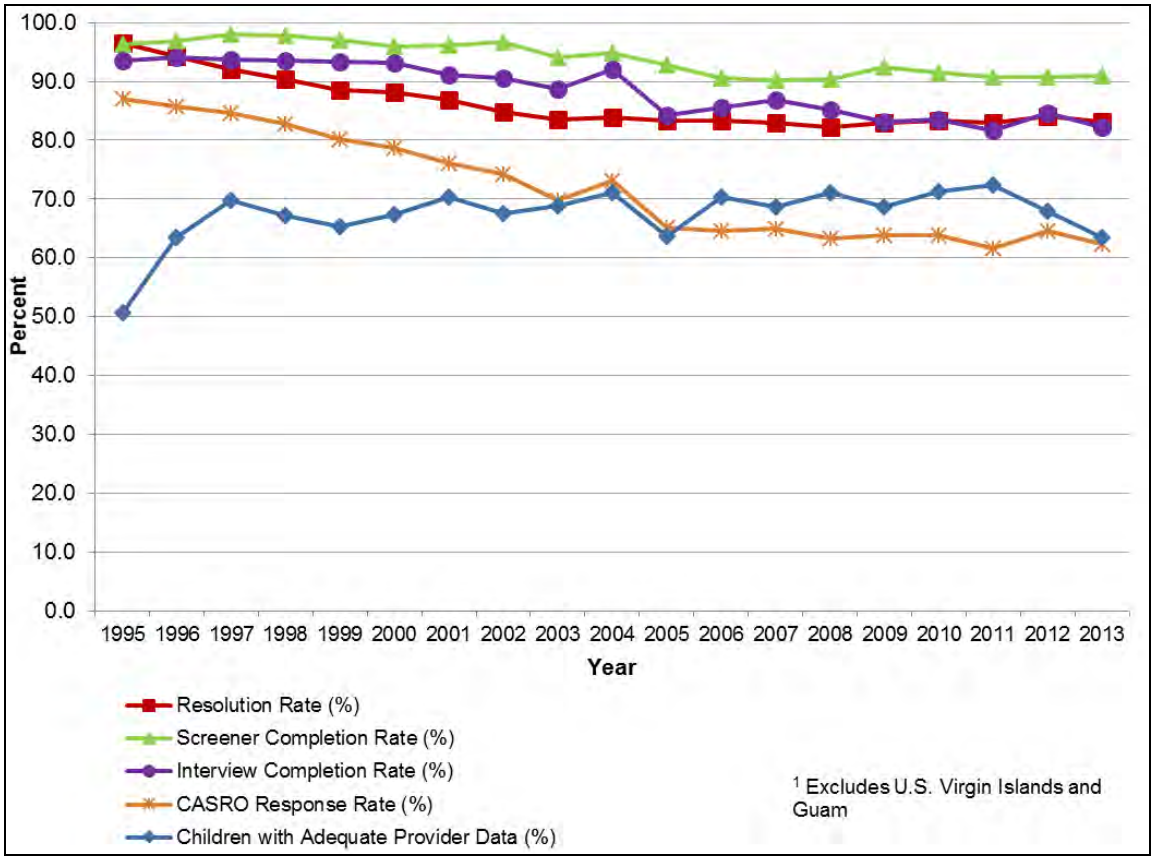


Figure G.1 provides a graphical representation of the data contained in table G.1. It shows how selected landline sample key indicators from the household and provider data collection performed throughout the years, from 1995 to present. We observe that the trend in the data collection rates is going downward, with the exception of the percentage of children with adequate provider data, which has been essentially flat since 1997. Note that these data reflect the landline sample only.

Table G.2: Key Indicators[1] from Cell-Phone Sample Household and Provider Data Collection by Survey Year, National Immunization Survey, 2011-2013[2]

Survey Year	Resolution Rate (%)	Screener Completion Rate (%)	Interview Completion Rate (%)	CASRO Response Rate (%)	Children with Adequate Provider Data (%)
2011	47.0	76.2	70.4	25.2	66.7
2012	52.4	77.5	75.5	30.6	63.9
2013	53.8	79.3	71.6	30.5	59.8

[1] For the definition of the key indicators see Table 1 of NIS Data User's Guide for the survey year of interest.
[2] Excludes the U.S. Virgin Islands and Guam.

Figure G.2: Trends in Cell Key Indicators from Household and Provider Data Collection by Survey Year, National Immunization Survey, 1995-2013[1]

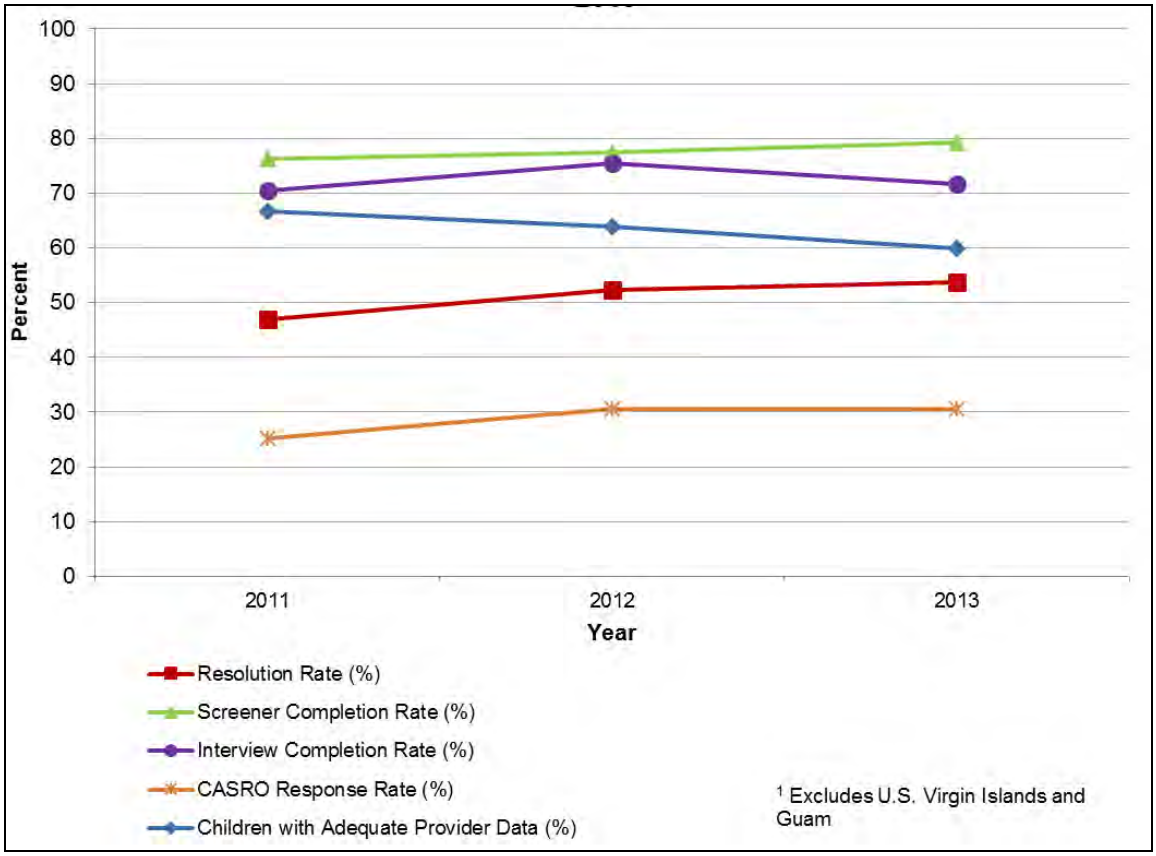


Figure G.2 provides a graphical representation of the data contained in table G.2. It shows how selected cell phone sample key indicators from the household and provider data collection performed from 2011 to present.

Table G.3: Vaccine-Specific Coverage Levels Among Children Age 19-35 months in the United States by Survey Year, National Immunization Survey, 1995-2013[1]

Survey Year[2]	4+ DTaP	3+ Polio	1+ MMR	3+ Hib^	3+ Hep B	1+ Varicella*	4+ PCV	4:3:1††	4:3:1:3‡
1995	78.4	87.8	89.8	91.2	67.9	N.A.	N.A.	76.0	73.7
1996	81.1	91.0	90.6	91.4	81.8	12.0	N.A.	78.4	76.4
1997	81.5	90.7	90.4	92.5	83.6	25.8	N.A.	77.9	76.2
1998	83.9	90.8	92.0	93.4	87.0	43.2	N.A.	80.6	79.2
1999	83.3	89.6	91.5	93.5	88.1	57.5	N.A.	79.9	78.4
2000	81.7	89.5	90.5	93.4	90.3	67.8	N.A.	77.6	76.2
2001	82.1	89.4	91.4	93.0	88.9	76.3	N.A.	78.6	77.2
2002	81.6	90.2	91.6	93.1	89.9	80.6	N.A.	78.5	77.5
2003	84.8	91.6	93.0	93.9	92.4	84.8	N.A.	82.2	81.3
2004	85.5	91.6	93.0	93.5	92.4	87.5	N.A.	83.5	82.5
2005	85.7	91.7	91.5	93.9	92.9	87.9	53.7	83.1	82.4
2006	85.2	92.8	92.3	93.4	93.3	89.2	68.4	83.1	82.2
2007	84.5	92.6	93.2	92.6	92.7	90.0	75.3	82.8	80.1
2008	84.6	93.6	92.1	90.9	93.5	90.7	80.1	82.5	79.6
2009	83.9	92.8	90.0	83.6	92.4	89.6	80.4	81.5	73.4
2010	84.4	93.3	91.5	90.4	91.8	90.4	83.3	82.0	78.8
2011	84.6	93.9	91.6	94.0	91.1	90.8	84.4	82.6	81.9
2012	82.5	92.8	90.8	93.0	89.7	90.2	81.9	80.5	80.0
2013	83.1	92.7	91.9	93.7	90.8	91.2	82.0	81.5	81.2

[1] Excludes the U.S. Virgin Islands and Guam.

[2] Prior to 2011, estimates are single-frame, landline-sample estimates. From 2011 onward, estimates are dual-frame (Landline plus Cell-phone) estimates.

^ Beginning in 2009, the number of doses required to be up-to-date on Hib depends on the manufacturer of the vaccine. However, the figures shown here refer to 3 or more doses of Hib vaccine regardless of manufacturer.

* Varicella was added to the NIS in 1996.

†† Four or more doses of DTaP, three or more doses of poliovirus vaccine, and one or more doses of any MCV.

‡ Four or more doses of DTaP, three or more does of poliovirus vaccine, and one or more doses of any MCV, and three or more doses of Hib.

Figure G.3: Trends in Vaccine-Specific Coverage Levels among Children 19-35 Months of Age in the United States by Survey Year, National Immunization Survey, Landline-Frame, 1995-2013[1 2]

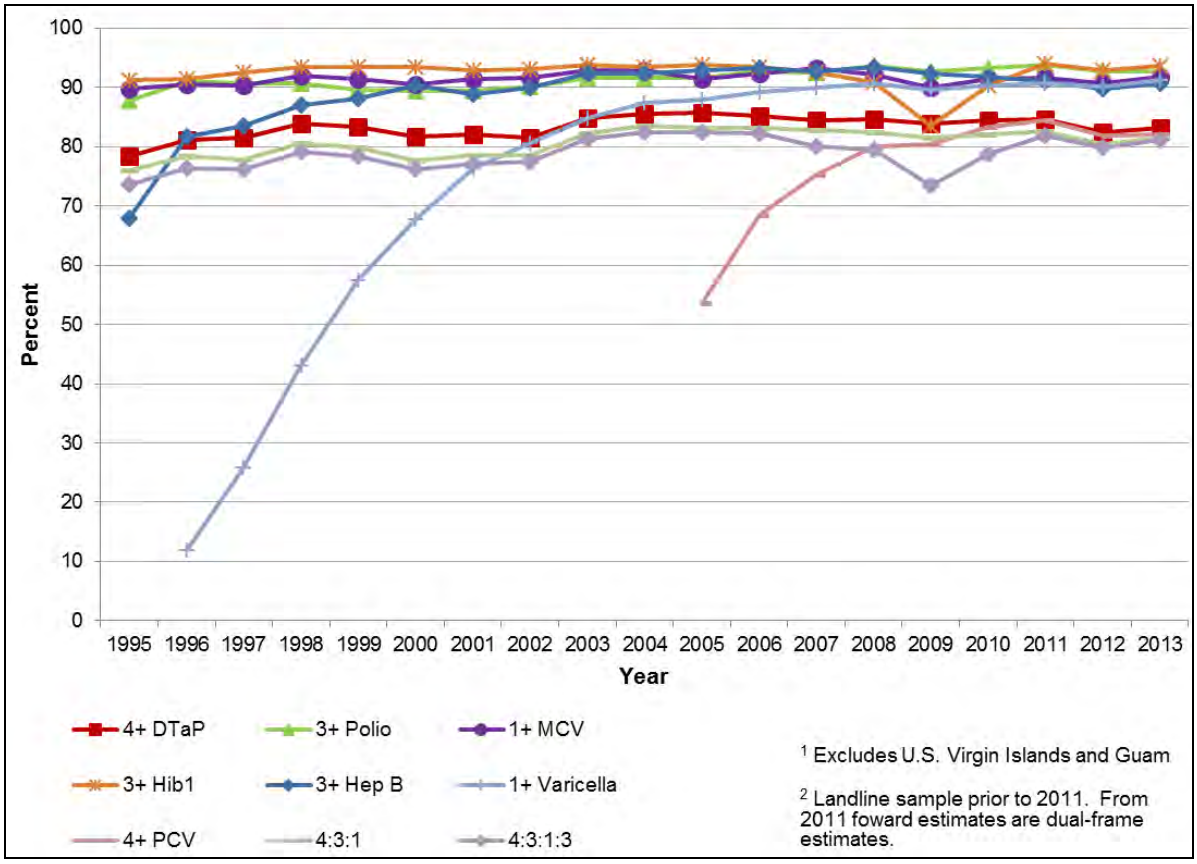


Figure G.3 provides a graphical representation of the data contained in Table G.3. It displays the trend in vaccine-specific coverage levels among children age 19-35 months from 1995 to present. We observe that the trend in the vaccination coverage levels is slightly upward for the longer established vaccines, while the early trends for new vaccines are strongly upward. Note that these data reflect the landline sample prior to 2011 and the dual-frame sample thereafter.

Appendix H: Vaccine Type Codes

Table H.1: 2013 NIS Vaccine Type Codes

Vaccine Code	Description
03	DTaP/DTP-containing, unknown type
04	DTaP
07	DTaP-Hib
08	DTaP-HepB-IPV
20	OPV
21	IPV
22	Polio-containing, unknown type
30	Measles-mumps-rubella
31	Measles only
32	Measles-mumps
33	Measles-rubella
43	HepB-Hib
44	Hib-only, unknown type
60	HepB-only
70	Pneumococcal conjugate, unknown type
71	Pneumococcal polysaccharide
72	Pneumococcal-containing, unknown type
73	Pneumococcal conjugate-7
74	Pneumococcal conjugate-13
D3	DTaP-IPV-Hib
FL	Seasonal influenza, unknown type
FM	Seasonal influenza spray
FN	Injected seasonal influenza
HB	HepB-containing, unknown type
HI	Hib-containing, unknown type
HM	Hib-only (Merck)
H2	Hib-only (Sanofi or GSK)
MM	Measles-containing, unknown type
RG	Rotarix (GSK)
RM	Rotateq (Merck)
RO	Rotavirus-containing, unknown type
VA	Varicella-containing, unknown type
VM	MMR-varicella
VO	Varicella-only