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2025 National Survey of Children's Health

Comprehensive Analytic Guide

The purpose of this guide is to provide information on appropriate analysis and reporting of National Survey of Children's Health (NSCH) data, serving as a single analytic resource to help quick-start analyses and prevent common errors or misinterpretations. It is designed for those conducting and reporting analyses of NSCH data. For many topics, this guide collates information found in other documents, including methodology reports and FAQs, with links to additional guides for the more complex topics of multiple imputation and multi-year analysis. For the 2016 to 2024 NSCH, there are two available datasets for analysis: 1) a household screener file to identify all children in the household, and 2) a topical questionnaire file for one randomly selected child within the household. Beginning in 2025, a single topical file that includes many indicators from the screener questionnaire will be released. This guide predominantly focuses on the more commonly used topical child-level dataset with detailed information from the questionnaire.

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NSCH Redesign and Non-Comparability to Prior Surveys

In 2016, the NSCH was redesigned to combine content from two prior surveys that were conducted every 4 years by telephone (the National Survey of Children's Health 2003, 2007, 2011/2012 and the National Survey of Children with Special Health Care Needs 2001, 2005/2006, 2009/2010) into a single annual address-based survey with web and mailed paper response options that retained the NSCH name. An accurate comparison of estimates between the redesigned NSCH and prior surveys cannot be made due to substantive changes in sampling frame and data collection modes, in addition to questionnaire content and wording in many cases. Any observed differences in estimates before and after the redesign, or lack thereof, may be attributable to design changes and it is not possible to identify true changes over time. Therefore, combining or comparing data from before and after the redesign is not recommended. Only estimates from the redesigned survey (2016 forward), without substantive changes in question wording, can be compared over time.

Item Comparability

The NSCH prioritizes consistency across years, but changes to question wording, response options, and data processing occasionally occur. One resource for assessing changes in questionnaire items across survey years is the NSCH Codebook. The codebook lists variables that are included in the NSCH public use files. Question wording, response options, reported ranges, and other details are organized alphabetically by variable name. If the details changed from one year to the next, the information is listed in separate panels under the variable name. The Data Resource Center (DRC) for Child and Adolescent Health also maintains a crosswalk of variables in an Excel file with wording changes highlighted.

In the case of major modifications or item additions and deletions, variables may not be combined across years. In other cases, response options can be collapsed in one year to mimic the response range available in another. Data users must decide if a change to question wording represents a substantial change to the data series and should note any related limitations with their reported results. When indicators used by the Title V Maternal and Child Health Service Block Grant Program or the Child and Adolescent Health Measurement Initiative cannot be compared across survey years, changes are noted in several resources, including the Federally Available Resource Document data notes, a Title V measure changes document, and indicator notes in the DRC interactive data query (Select a Measure→ click the info icon for more information→ see Revisions and Changes).

Coding Resources

With each annual data release, the U.S. Census Bureau provides SAS and Stata input files with formats for all variables. A variable list PDF that includes questions and response options with topical questionnaire age range (T1=0-5 years, T2=6-11 years, T3=12-17 years) as well as a frequencies PDF with weighted and unweighted counts and percentages for each response category are also provided. In addition, the NSCH Codebook can be used to filter by year, source/topic, and variable name to examine response options for coding and analysis. Filtered variable lists can be downloaded as a PDF or CSV. The Title V measure code for commonly coded indicators with example crosstabs is also provided in both SAS and Stata (see data release page).

Additional resources provided by the DRC for Child and Adolescent Health include SPSS, SAS, and Stata codebooks for over 300 indicators and survey items as well as fully recoded data sets with these indicators provided in single and two-year files.

Unit of Analysis – Children rather than Parents

Children, 0-17 years, are the unit of analysis for the NSCH with weights for estimates to be nationally and state representative. Estimates do not generalize to the population of parents, mothers, other primary caregivers, or pediatric health care providers. Analysts should avoid statements such as the "percent of parents" and instead refer to the "percent of children with parents" that have a given characteristic (e.g., 68% of US children live with mother who has excellent or very good mental and emotional health). We are evaluating options to release parent-level weights in the future. Since the degree of weight that a parental respondent receives is in direct proportion to the number of children they have, weights can be divided by the number of children in the household for a crude approximation of parent-level weights. However, given that not all mothers and fathers are coresident or respondents to the survey, it is not possible to represent all mothers or fathers in analyses of the NSCH.

Describing the Survey Design

Standard descriptions of the survey generally include a combination of the following details:

- Annual frequency
- Cross-sectional design
- Nationally and state representative
- Address-based sampling frame
- Completed by a parent/caregiver familiar with the child's health
- Web and mailed paper response options
- Multi-stage selection (household roster and one randomly selected child for the topical interview)
- Differential selection probabilities that vary by:
    - State - states with larger population are sampled at a lower rate to achieve approximately equal state-level base sample sizes
    - Stratum - higher selection probability in the stratum more likely to contain children as determined by administrative records (Stratum 1)
    - Child age - children 0-5 years sampled at 60% given that young children are often under-represented in household surveys
    - Special health care need status - children with special health care needs sampled at 80% given the smaller population size

Reporting Response Rates

The overall response rate (ORR) and the interview completion rate (ICR) are two commonly reported response rate metrics that are consistent with Standard Definitions from the American Association for Public Opinion Research. The ORR is the probability that an *address* progresses through all three stages of the survey: resolution of the address as an occupied residence or household (either through initiating the Screener or a return code from the postal service), completion of the Screener if confirmed as a

household, and completion of the Topical questionnaire if the household contains children. Stated another way, the ORR reflects the proportion of addresses that completed the survey, including those that may not be valid or occupied. By contrast, the ICR is the probability that a confirmed *household* progresses through the screener and the topical questionnaire, if applicable. Because an address can only be confirmed as a household by starting the Screener, the ICR can also be described as reflecting the proportion of households that complete the survey among those that initiate response, either by starting the web version or mailing back a paper version. Both response rates are weighted to account for the differential probability of selection described in the previous section.

Response rates are not necessarily correlated with survey quality or bias. In fact, some surveys with high response rates have produced estimates with relatively high non-response bias and vice versa.[1] Many causes of survey non-response may be correlated with sociodemographic characteristics and are accounted for through survey weights.

Weighting

The NSCH provides survey weights to account for the probability of selection and non-response with demographic adjustment, also known as raking, to represent the non-institutionalized population of children ages 0-17 residing in housing units in the U.S. and each state and the District of Columbia.

With the 2022 data release, the weighting approach was revised to improve alignment with the race reporting options in the American Community Survey, which serves as the data source for population controls (1-year estimates from the prior year). The revised approach also improved the granularity and accuracy of racial/ethnic counts nationally and by state, where possible (see the NSCH weighting and imputation technical document). Historical files were re-released to ensure comparability for trending.

The following general steps are taken to develop child-level weights, consistently across survey years:

- Calculate the base sampling weight (the inverse probability of the selection of the address), which varies by strata (two with one more likely to contain children than the other) and state
- Adjustment for screener nonresponse by strata, geographic, and demographic characteristics
- Adjustment for within-household subsampling factors, varying by age and special health care needs status
- Adjustment for detailed topical questionnaire nonresponse
- Adjustment to match sample demographic estimates to various demographic controls

  Screener raking dimensions

  1) State by Child's Race and Ethnicity *(Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic American Indian/Alaska Native (AIAN), Non-Hispanic Asian, Non-Hispanic Native Hawaiian or Pacific Islander (NHPI), Non-Hispanic 2+ Races)**
  2) State by Child's Sex by Child's Age Group *(0-5, 6-11, 12-17 years)*

  Topical raking dimensions

  1) State by Household Poverty Ratio *(≤100%, 101-200%, >200%)*
  2) State by Household Size *(≤3, 4, >4)*

[1] Robert M. Groves, Emilia Peytcheva, The Impact of Nonresponse Rates on Nonresponse Bias: A Meta-Analysis, Public Opinion Quarterly, Volume 72, Issue 2, Summer 2008, Pages 167–189, https://doi.org/10.1093/poq/nfn011

3) State Groupings by Respondent's Education *(<High School, High School, >High School)*
4) State by Selected Child's Race and Ethnicity *(Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic AIAN, Non-Hispanic Asian, Non-Hispanic NHPI, Non-Hispanic 2+ Races)**
5) State by Selected Child's Age Group *(0-5, 6-11, 12-17 years)*
6) National Selected Child's Race and Ethnicity *(Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic AIAN, Non-Hispanic Asian, Non-Hispanic NHPI, Non-Hispanic 2+ Races)*
7) National Selected Child's Sex by Single Year of Age

*Certain groups (Non-Hispanic (NH) Black, NH Asian, NH AIAN, NH NHPI) with <30 sampled children per state are collapsed with 2+ races for stability; refer to each year's methodology report to see state-specific collapsing.

The NSCH public-use file includes demographic detail that, in some cases, is partially adjusted in weighting. For any demographic characteristic not explicitly included in a post-stratification adjustment (i.e., the raking dimensions), the weights are not likely to sum to that specific population total. Along these lines, the state-level design of the NSCH means that median weights can differ significantly across states (i.e., larger weights for more populous states with a lower probability of selection given approximately equal state-level sample sizes). For example, weights for AIAN children in large states without a specific weighting dimension for this group (requirement of 30+ NH AIAN observations) may receive disproportionate weighting with certain outliers having undue influence on estimates. We recommend that data users apply caution and evaluate the impact of high-leverage cases when examining and interpreting results for smaller population groups. Additional information on limitations and data-use recommendations is available in each year's methodology report.

Non-Response Bias

All survey years of the NSCH include an evaluation of non-response bias conducted with three goals: (1) to describe how the NSCH nonrespondents are different from the respondents; (2) to describe how well the weighting adjustments to correct for nonresponse performed; and (3) to present and discuss the effect of nonresponse, and the weighting corrections for nonresponse, on selected key survey estimates. Comparisons to similar estimates from other national surveys are also made. Non-response tends to be greater in areas with larger non-White populations, lower household incomes, less homeownership, and fewer college graduates. In general, adjustment for non-response reduces but does not completely eliminate income differences between respondents and the full sample. However, non-response bias analyses of the NSCH have consistently found that key estimates obtained by weighted means from respondents versus predicted means from the full sample are similar (bias <5% in most cases and in both directions). Thus, there is no strong or consistent evidence of nonresponse bias in the NSCH.

Estimating Demographic Characteristics

The NSCH is not the official source of national or state-level demographic characteristics for children (e.g. poverty, health insurance, age, race/ethnicity). The Census Bureau's American Community Survey

(ACS), population estimates program, and small area income and poverty estimates (SAIPE) provide more accurate and precise measures of various demographic characteristics at national, state, and even county or census tract levels. NSCH estimates may vary from these sources and should generally not be presented alone but in combination with other health and health care indicators collected in the survey.

Children with Special Health Care Needs

As the survey sponsor, the Maternal and Child Health Bureau has a core responsibility to monitor and improve outcomes for children with special health care needs (CSHCN). The NSCH is unique in estimating the number and percent of CSHCN to support the planning and improvement of health care services for those with chronic conditions who often need more services than their peers.

MCHB defines CSHCN as those "who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally." The NSCH identifies CSHCN using a set of five "screener" questions that ask parents/caregivers if their child has service needs or limitations due to a health condition that has lasted or is expected to last 12 months or longer. These include:

- Need or use of prescription medication(s)
- Elevated need or use of medical care, mental health, or education services
- Functional limitations (that limit daily activity)
- Need or use of special therapies (for example, physical, occupational, or
- speech therapy)
- Developmental or behavioral problems for which treatment or counseling is needed

MCHB now uses an expanded approach to identify CSHCN that includes parent/caregiver report of one or more specific conditions (for example, asthma, autism, anxiety, ADHD) AND difficulties (for example, breathing, digesting food, concentrating, coordination) on the subsequent topical questionnaire when missed by the initial five questions. This group of children has similar needs and impacts as other CSHCN and are more likely to be younger, Hispanic, and from households with lower education. Using the expanded CSHCN definition increases the overall national CSHCN prevalence by ~5 percentage points. Coding for the expanded CSHCN definition is available in the Title V SAS and Stata code and the DRC for Child and Adolescent Health SPSS, SAS, and Stata codebooks.

The "screener" is currently the only CSHCN definition available to estimate the proportion of households that have one or more CSHCN (see Household Analysis of the Screener Data File). Efforts are underway to improve the screener items for CSHCN and their families.

Variance Estimation

Variance estimates, including standard errors, need to be adjusted and often increased to account for the complex survey design (unlike a simple random sample). The design elements that need to be incorporated in statistical software include the strata (state=fipsst, stratum=stratum) and primary sampling unit or PSU (household=HHID). The application of these design elements varies by statistical software package: Stata can include only one strata variable and requires creation of a crossed variable between the two (51 states x 2 strata = 102 groups). SUDAAN requires the use of numeric variables for design elements and can identify both strata and PSU in a single NEST statement, but the PSU order must be identified.

States and/or years can be subset in a restricted dataset because the design information is complete and independent. For all other subgroup analyses (i.e., not all children 0-17), a subgroup statement is required to properly estimate variance using full design information and not just the strata represented in the subgroup. Example SAS, SUDAAN, and Stata code with subpopulations are provided below using the example of adolescents (12-17 years) having a private conversation with a doctor (DOCPRIVATE).

SAS

```
proc surveyfreq nomcar;  * treats non-missing values as a domain;
strata stratum fipsst; * design statements;
cluster hhid;
weight fwc;
table DOCPRIVATE/ cl (type=logit);
run;
```

Note: For variables only available for a certain population (such as the example above for private conversations with a doctor among adolescents), using the NOMCAR option is sufficient to account for the full design information and treat non-missing values as a subpopulation (what SAS calls a domain). For variables with information available for the full population where only a subgroup is of interest, a variable identifying the domain should be in the table statement (domain*var). Regression commands offer a separate domain statement. In both cases, estimates are still provided for all groups—not just the specific subgroup of interest. Using BY or WHERE statements will not provide appropriate variance estimation.

SUDAAN

```
proc crosstab design=wr notsorted;
      nest fipsstnum stratumnum hhidnum / psulev=3;
      subpopx SC_AGE_YEARS>=12;
      weight fwc;
      class docprivate;
      table docprivate;
run;
```

Stata

```
egen stratacross = group(fipsst stratum)

svyset[pweight=fwc], strat(stratacross) psu(hhid) singleunit(certainty) vce(linearized)

svy,subpop(if sc_age_years>=12): proportion docprivate
```

Multi-Year Estimates

When analyzing multiple or pooled years of cross-sectional survey data, the individual year survey weights will produce correct *prevalence estimates* reflecting a multi-year period. However, individual year survey weights need to be adjusted to produce the correct *weighted population sizes* that reflect an average annual or midpoint population rather than a cumulative or duplicated period population size. Since each survey year is individually weighted to represent the population of children residing in households for that year, the weight for the pooled sample can simply be divided by the number of years being combined to derive multi-year estimates with an average annual or midpoint population

size. For example, to calculate the survey weight for the combined 2016-2018 multi-year period, each individual survey weight should be divided by 3 (i.e., number of survey years being combined for 2016-2018). The use of a combined weight is necessary for all analyses in which a weighted population size will be reported for the combined period.

It is also necessary to correctly define sampling strata to estimate variance and standard errors for statistical testing when analyzing multiple years of data. In 2016, there were two strata with STRATUM 1 representing addresses more likely to contain children than STRATUM 2. In 2017 and subsequent years, sampling for STRATUM 2 was split into Strata 2a and 2b, with no addresses selected from Stratum 2b that have a very low likelihood of having children in residence. When analyzing individual years, the strata can be used as defined on the individual data file. When analyzing combined years of data including 2016, it is recommended that STRATUM=2a records be recoded as STRATUM=2 to ensure that the combined file is correctly treated as having two mutually exclusive sampling strata rather than three.

Example SAS and Stata code to adjust the survey weights for X number of combined years and to recode STRATUM 2a is below.

For more information on multi-year analysis, including data presentation, statistical significance testing, and trend analysis, please see the Guide to Multi-Year Estimates.

SAS

```
fwcXyr=fwc/X; * Create average annual weight, dividing by X number of
years;
if stratum='2A' then stratum='2'; * Necessary if analyzing
2016 data or to convert to numeric if using SUDAAN for any
year;
hhidnum = input(hhid,8.); * Convert design variables to numeric for
SUDAAN; fipsstnum = input(fipsst,8.);
stratumnum = input(stratum,8.);
```

Stata

```
gen fwcXyr = fwc/X   /* create average annual weight, dividing by X number of years  */

tostring stratum, replace  /*necessary if analyzing 2016 data in combination with other years*/
replace stratum = "2" if stratum == "2A"
        destring stratum, replace

egen stratacross=group(fipsst stratum)   /* create single cluster variable for svy */

svyset hhid [pweight=fwcXyr], psu(hhid) singleunit(certainty) vce(linearized)
```

State to National Comparisons

Analysts can use a nested Z-test to identify significant differences between state and national estimates at a given alpha or Type 1 error level (e.g., 0.05, 0.01). Compared to a standard independent sample Z-test,

the nested version essentially subtracts a portion of variance for a state that is shared with the nation, yielding a lower squared error for the difference in estimates and higher Z value. Thus, an independent Z-test is a more conservative test that may increase Type II error—the probability of failing to reject the null of no difference when there is, in fact, a difference. The formula for the nested Z-test is as follows:

$$Z = \frac{\bar{X}_i - \bar{X}_j}{\sqrt{SE_i^2 + SE_j^2 - 2P * SE_j^2}}$$

Where *j* is a subset of *i* (e.g., Alabama as part of the Total U.S.), $\bar{X}$ is the mean or proportion, *SE* is the standard error, and *P* is the proportion of the weighted denominator for a given indicator that is specific to j (e.g., Alabama weighted denominator divided by the Total U.S. weighted denominator).

It should be noted that some states have sponsored oversamples to increase sample size and enable or enhance analyses for subpopulations. States that have oversampled in a given year, will have improved precision with greater power to detect differences compared to national estimates.

Household Analysis of the Screener Data File (2016 to 2024 NSCH)

While less frequently used, the Screener file can be used to estimate the proportion of households that have at least one child with special health care needs (CSHCN) using the household level weight (FWH). The Screener can also be used to estimate the proportion of children with special health care needs using the child-level weight (C_FWS). However, the topical file is more commonly used given the additional questionnaire items available, including those that are used in the expanded definition of CSHCN (see the CSHCN section). Each row on the Screener data file represents a rostered child. When calculating household-level estimates, households should be collapsed to a single row (using HHIDS as the household ID) which can be accomplished by selecting a single row from each household (e.g., LINENUM = 1). SAS and Stata code are provided below for the example of calculating the proportion of households with at least one CSHCN (household-level) as well as estimating the proportion of CSHCN (child-level).

SAS/SUDAAN Code

```
data screener;
set nsch_XXXXe_screener;
if stratum='2A' then stratum='2'; * Recode for SUDAAN numeric;
fipsstnum = input(fipsst,8.);
stratumnum = input(stratum,8.);
hhidsnum = input(hhids,8.);
if c_cshcn=2 then c_cshcn=0; * recode cshcn as 0,1;
run;
proc summary data=screener; * sum number of cshcn in household;
class hhids;
var c_cshcn;
output out=cshcn sum=cshcn_count;
run;
data household; * merge screener file and cshcn sum;
merge screener (in=a) cshcn (keep= hhids cshcn_count);
by hhids;
if a and linenum=1; * keep one/first record per household;
```

```
if cshcn_count>=1 then hh_cshcn=1; else hh_cshcn=0;
run;
* SAS - % households with at least one CSHCN;
proc surveyfreq data=household;
strata fipsst stratum; * design statements;
cluster hhids;
weight fwh;
table hh_cshcn / cl (type=logit);
run;
* SAS - % of children with SHCN;
proc surveyfreq data=screener;
strata fipsst stratum; * design statements;
cluster hhids;
weight c_fws;
table c_cshcn / cl (type=logit);
run;
* SUDAAN - % households with at least one CSHCN;
proc crosstab data=household design=wr notsorted;
nest fipsstnum stratumnum hhidsnum / psulev=3;
weight fwh;
class hh_cshcn;
table hh_cshcn;
print nsum wsum rowper serow lowrow uprow  /style=nchs nsumfmt=f10.0
wsumfmt=f10.0 rowperfmt=f6.1 lowrowfmt=f6.1 uprowfmt=f6.1;
run;
* SUDAAN - % of children with SHCN;
proc crosstab data=screener design=wr notsorted;
nest fipsstnum stratumnum hhidsnum / psulev=3;
weight c_fws;
class c_cshcn;
table c_cshcn;
print nsum wsum rowper serow lowrow uprow  /style=nchs nsumfmt=f10.0
wsumfmt=f10.0 rowperfmt=f6.1 lowrowfmt=f6.1 uprowfmt=f6.1;
run;
```

Stata Code

```
use "nsch_XXXXe_screener.dta"
tostring stratum, replace  /* necessary if analyzing 2016 data in combination with other years */
replace stratum = "2" if stratum == "2A"
destring stratum, replace

replace c_cshcn=0 if c_cshcn==2 /* recode to 0,1 */

egen cshcn_count = total(c_cshcn), by(hhids) /* sum # of cshcn in household */
generate hh_cshcn = (cshcn_count > 0) /* 0,1 if any cshcn in household */

keep if linenum==1  /* single record per household */

egen stratacross = group(fipsst stratum)
svyset hhids [pweight=fwh], strata(stratacross) psu(hhids) singleunit(certainty) vce(linearized)

* % of households with at least one CSHCN
svy: tab hh_cshcn, percent se ci format(%4.2f)
```

```
svy: tab hh_cshcn, obs count format(%11.5gc)

use "nsch_XXXXe_screener.dta", clear
tostring stratum, replace  /* necessary if analyzing 2016 data in combination with other years */
replace stratum = "2" if stratum == "2A"
destring stratum, replace

egen stratacross = group(fipsst stratum)
svyset hhids [pweight=c_fws], strata(stratacross) psu(hhids) singleunit(certainty) vce(linearized)

* % of children with SHCN
svy: tab c_cshcn, percent se ci format(%4.2f)
svy: tab c_cshcn, obs count format(%11.5gc)
```

Missing Data

For several demographic variables used in the construction of survey weights, missing data require imputation, which substitutes a plausible response based on observed data. Child sex, race, and Hispanic origin and household tenure (owning versus renting) are imputed using hot-deck imputation—these variables are used in the Screener or household weighting with <2% missing data. Adult 1 education, household size, and total family income (not included on the public use file but used in construction of the family poverty level or FPL) are imputed using sequential regression imputation methods—these variables are used in the Topical weighting and tend to have higher levels of missing data. In particular, approximately 20% of the annual NSCH sample is missing one or more components of FPL, which vary by other known demographic characteristics (indicating that data is not missing completely at random). A "complete-case" analysis, using only cases with observed or known values, assumes that data are missing completely at random (unrelated to other observed characteristics) and will reduce sample size and often bias estimates when there is a substantive amount of missing data (typically considered as more than 5%).[2] The Topical file includes a single implicate for Adult 1 education (A1_GRADE) and household size (HHCOUNT), and six implicates for FPL (FPL_I1-FPL_I6) with flag variables to identify which observations were missing. Given the extent of missing data for FPL, multiple imputation producing several different predicted values is helpful to account for the uncertainty in estimating the true value and to appropriately increase standard errors. Using only a single imputation, particularly with a large amount of missing data, incorrectly assumes certainty in the imputation as if there were no missing data at all—and will produce standard errors that are too low and tests of significance that are too high (increased Type 1 error). SAS/SUDAAN and Stata code for the analysis of multiply imputed poverty data is available in the Guide to Multiply Imputed Data Analysis.

For other variables not used in weighting, item missingness is generally less than 5% but can compound in multivariable analysis including construction of multi-item indices. There are several options for handling missing data, such as imputation discussed above (see IVEware), complete case analysis, or use of a missing indicator. The latter is least desirable because distributions are incorrect and often bias effect estimates for non-missing categories given that missing values have an unknown response that

[2] Graham JW. Missing data analysis: making it work in the real world. Annu Rev Psychol. 2009;60:549-76. doi: 10.1146/annurev.psych.58.110405.085530.

should be part of available categories.[3,4] Complete case analysis is superior to missing indicators but is still prone to bias when missingness varies by observed characteristics. To avoid information loss and possible bias with multi-item indices that would occur through a complete case analysis (excluding cases missing on any items), another option involves only excluding cases when all items are missing by using available data to impute an index value. This is the approach that is implemented for Title V National Performance and Outcome Measures. For example, having a medical home includes 5 components. In cases where some components have missing values, the available data are used in the same way as the overall measure: if all non-missing components are affirmative then the case is assigned as having a medical home and if any non-missing component is negative then the case is assigned as not having a medical home. Thus, only cases with missing data for all components are excluded. The appropriateness of this approach can be partially assessed by examining whether those with any missing data have a similar likelihood of the indicator distribution as those with no missing data. However, without controlling for characteristics related to missingness, similar distributions would assume that data are missing completely at random.

Family Income / Poverty

The calculation of the family income to poverty ratio (FPL or family poverty level) uses Census Bureau poverty thresholds and should NOT be referred to as the federal poverty level. Census Bureau poverty thresholds, determined by family size and number of children, are updated annually for inflation and serve as the official poverty rate definition for the nation. The Department of Health and Human Services annually issues poverty guidelines that vary geographically to determine program eligibility. The poverty guidelines are sometimes loosely referred to as the "federal poverty level" (FPL), but that phrase is ambiguous and should be avoided. While the variable name stem is FPL (FPL_I1 – FPL_I6), it refers to the family poverty level, and the abbreviation should be avoided due to confusion with the federal poverty level. It can be plainly described as a percentage of the poverty level, family income-to-poverty ratio, or family poverty level or threshold. In addition, it is not fully accurate to refer to FPL as household poverty because it is measured based on family income.

Data Presentation Standards

In both individual year and multi-year analyses, the NSCH sample size may be limited for smaller populations (e.g., American Indian/Alaska Native) and state-level subgroups or rare outcomes (e.g., adolescents with special health care needs, children with autism in a particular state). Small sample sizes may produce unstable estimates. To minimize misinterpretation, only presenting statistics with a sample size or unweighted denominator of 30 or more is recommended. Additionally, if the 95% confidence interval width exceeds 20 percentage points or 1.2 times the estimate (≈ relative standard error>30%), flagging the estimate for poor reliability and/or presenting a measure of statistical reliability (e.g., confidence intervals or statistical significance testing) is recommended to promote appropriate interpretation.

[3] Greenland S, Finkle WD. A critical look at methods for handling missing covariates in epidemiologic regression analyses. Am J Epidemiol. 1995 Dec 15;142(12):1255-64. doi: 10.1093/oxfordjournals.aje.a117592.
[4] Allison PD. *Missing Data*. Thousand Oaks, CA: SAGE Publications, Inc.; 2002. doi:10.4135/9781412985079

More stringent data presentation standards with greater suppression of unreliable estimates may also be applied. See for example, the National Center for Health Statistics Data Presentation Standards for Proportions.

Race and Ethnicity Detail

In accordance with guidelines from the Office of Management and Budget, data for all major racial/ethnic groups are collected and included in the public use files. For groups with the largest proportions reporting a race in combination with another race (i.e., American Indian/Alaska Native, Asian, and Native Hawaiian/Pacific Islander), variables identifying the reporting of these groups alone or in combination with another race are included, enabling more holistic analysis with larger sample sizes for these groups. Further detail on multiple race for other groups and specific racial/ethnic combinations as well as ancestral countries for Hispanic/Latino, Asian, and Pacific Islander populations are available on restricted access files (see next section on Confidential Data Access).

With the 2022 data release, revisions to weighting and imputation for race and ethnicity were made to improve comparability with the American Community Survey (ACS) response options that are used in weighting to population counts; and specifically, to address the additional "Some Other Race" category available only in the ACS. All historical files were re-released to ensure comparability for trending. In brief, these revisions resulted in the following adjustments: 1) improved weighted population counts, nationally and where possible by state (30+ sample size), for American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and multiple race groups that were previously collapsed into an "other" category; and 2) corrected over-reporting of "Other Pacific Islander", particularly for Hispanic respondents, who are less likely to identify as a racial group and therefore more likely to select "Other Pacific Islander" as this option was the last available race option listed on the questionnaire. However, adjustments did not fully correct the disproportionate reporting of "Other Pacific Islander" by the Hispanic population. Therefore, reporting estimates of only non-Hispanic Native Hawaiian/Pacific Islander is recommended and is more consistent with mutually exclusive categories of race and ethnicity used in weighting. More detail on weighting and imputation revisions for race and ethnicity can be found in a technical document and each year's methodology report.

Given smaller sample sizes for smaller racial and ethnic groups in certain states, various states have sponsored oversamples in census tracts with larger populations of these groups to enable reporting and improved reliability of estimates by race and ethnicity.

Confidential Data Access

Certain detail cannot be released on the public use file to protect respondent confidentiality in accordance with U.S. Census Bureau protocols under Title 13 of the United States Code. For example, metropolitan status without suppression, sub-state geography, date of interview completion, and detailed racial groups when used in combination with other variables could risk respondent identification. Additional suppressed variables and range caps for rare values are noted in each year's methodology report. Researchers can access this restricted information through the Federal Statistical Research Data Centers (RDC). To access data in the RDC, researchers must submit a research proposal and secure Special Sworn Status. RDC access may involve fees and initial travel to establish access, upon

which remote access is possible. All data products using restricted-access data must be approved by the Census Bureau's Disclosure Review Board prior to public release.

Geographic Detail

Only the respondent's state of residence is available on the public use file. Through the RDC process noted in the previous section, researchers can link to other geographic-based data (e.g., county or census tract) with an approved project. Some states have oversampled to produce direct county-level or planning region estimates, with geographic identifiers only accessible through an approved RDC project. In general, however, special model-based small area estimation methods are needed to produce sub-state estimates.