

**Multiple Year**

**2018–2020**

**Behavioral Risk Factor Surveillance System**

**Child**

**Asthma Call-back Survey**

**Analysis Guidance**

**Supplement**



**National**

**Asthma**

**Control**

**Program**

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Kanta Sircar, PhD, MPH, PMP

Acting Branch Chief

Commander, US Public Health Service

Asthma and Community Health Branch

Division of Environmental Health Science and Practice

National Center for Environmental Health

Centers for Disease Control and Prevention

4770 Buford Hwy, NE

Mailstop S106-6

Atlanta, GA 30341 USA

Phone: (770) 488-3388

E-mail: ddq0@cdc.gov

Machell G. Town, PhD

Chief, Population Health Surveillance Branch

Division of Population Health

National Center for Chronic Disease Prevention and Health Promotion

Centers for Disease Control and Prevention

4770 Bufford Hwy, NE

Mailstop S107-6

Atlanta, GA 30341 USA

Phone: (404) 488-4681

E-mail: mpt2@cdc.gov

**Multiple Year 2018–2020**

**Behavioral Risk Factor Surveillance System: Child Asthma Call-back Survey (ACBS)**

**Analysis Guidance Supplement**

The Child Asthma Call-back Survey (ACBS) follows the main survey of the Behavioral Risk Factor Surveillance System (BRFSS). The Child Asthma Call-back Survey (ACBS) requires use of the BRFSS Random Child Selection Module and the Childhood Asthma Prevalence Module during the BRFSS survey interview. BRFSS survey respondents are eligible for the Child ACBS if they reported that the randomly selected child in the household has ever been diagnosed with asthma (lifetime asthma). If both a randomly selected child and adult in one household have been diagnosed with asthma, then only one of them is eligible for the ACBS.

The number of children reported as being diagnosed with lifetime asthma during the BRFSS interview differs depending on each state’s BRFSS sample size, and typically ranges from 200 to 1,000. To create a reliable single-year child ACBS weight, an ACBS child file must have a minimum of 75 completed child records. For states with sufficient sample sizes (≥75), single-year data with final weights (CLLCPWT\_F) are available at [CDC - BRFSS - BRFSS Asthma Call-back Survey](https://www.cdc.gov/brfss/acbs/index.htm). Due to sample loss between the BRFSS interview and the ACBS interviews, the number of completed child interviews for the ACBS ranged from 22 to 135 from 2018 through 2020 (Table A, p. 7). Beginning in 2009, the state child ACBS data were not weighted and were not included in the public release file if there were fewer than 75 completed interview records. To keep consistency across the participating states, the data from 2018 through 2020 were combined and reweighted to represent an average individual year of lifetime asthma population for that state. All states included in the multiple year file contributed data for all three years 2018, 2019, and 2020 except for New Hampshire and Texas (collected data in 2019 and 2020 only) and Oregon (collected data in 2018 and 2019 only). The child ACBS multiple year file sample sizes by year and state are shown in table A.

The child demographic information can be found in the BRFSS Random Child Selection Module. All the BRFSS variables are included in the dataset, the BRFSS codebooks for each year are available at [BRFSS annual data set](https://www.cdc.gov/brfss/annual_data/annual_data.htm). The ACBS History and Analysis Guidance documents are available at [CDC - BRFSS - BRFSS Asthma Call-back Survey](https://www.cdc.gov/brfss/acbs/index.htm). The details highlighted in this supplemental document are intended to assist data users in analyzing the combined [2018–2020 Child ACBS data set](https://www.cdc.gov/brfss/acbs/combined_years_18-20.html).

The annual child ACBS weighting process is based on the BRFSS final child weight for the randomly selected child (\_CLLCPWT). The sum of the BRFSS child weights (\_CLLCPWT) for records reporting children with lifetime asthma is an estimate of the total population of children in the state with lifetime asthma. For the ACBS weight, the BRFSS child weight for the randomly selected child is adjusted for loss to sample between the BRFSS interview and the ACBS interview. After adjusting for sample loss, demographic post-stratification group (age/sex/race) adjustments are made to account for differential non-response. As a result of the adjustment for sample loss and the post-stratification adjustment, for each state, the sum of the ACBS final weights for all ACBS child records is equal to the estimated total state population of children with lifetime asthma in that state. The final weight for multiple years (2018–2020) of ACBS data is \_CHILDWT\_M\_YEARS.

The multiple years of data were adjusted to represent an average individual year lifetime asthma population for each state. The following is a summary of weighting multiple-year child ACBS data:

1. Three years BRFSS asthma population total: Sum of BRFSS Final Child Weight (\_CLLCPWT) for CASTHDX2=1 (“Yes” for BRFSS ever diagnosed asthma question)
2. Computed the yearly proportion ratio, applied the yearly proportion adjustment on BRFSS Final Child Weight (\_CLLCPWT) before ACBS post-stratification.
3. Yearly Proportion Ratio:

Proportion\_20XX\_Ratio = 20XX child asthma population /

Sum of child BRFSS asthma population total from 2018 to 2020

1. Adjustment for ACBS sample loss (refused ACBS / lost to follow-up) based on agree-to-be-called-back rate.
2. Stratification for non-response: forces the sum of final weight (\_CHILDWT\_M\_YEARS) for each demographic cell (age/sex/race) from the ACBS data to equal to the Sum of BRFSS final weight from each BRFSS “Yes” Lifetime Asthma respondent for each (age/sex/race) cell.
3. **Estimation procedures for statistical analysis**
	1. **Record Weights**
		1. The unweighted data represent the number of actual responses. The final child weight for combined years 2018–2020 ACBS dataset is **\_CHILDWT\_M\_YEARS**.
	2. **Calculated Variables**
		1. The data for BRFSS variables are included with the Child ACBS data set. A new variable for child race (**CHILD\_RACE\_M\_YEARS**) has been calculated for the combined child data set to account for differences in the race variable between individual years. A new variable for age (**CHILD\_AGE\_YEAR**) with imputed missing values has also been created for the combined data set to address variable differences in child age between individual years. For reported child age, please use **MNTHDIFF** (child age in months).
	3. **Variances**
		1. The Child ACBS uses a complex survey design, and therefore statistical software such as SAS, SUDAAN, Epi Info, SPSS and STATA, or other analytical packages must be used that can account for complex sample designs. Accordingly, the statistical code must specify “with replacement” (**WR**) and include stratum variable (**\_STSTR**), primary sampling unit (**\_PSU**), sample design survey year (**SURVEY\_YEAR**), and record weight (**\_CHILDWT\_M\_YEARS**). See sample code in Section B.
4. **Sample code**

**/\* SUDAAN Code for 3 Age group and current asthma \*/**

PROC CROSSTAB DATA=ACBS\_CHILD\_18\_20 DESIGN=WR;

NEST SURVEY\_YEAR \_STSTR \_PSU / NOSORTCK MISSUNIT PSULEV=3;

SUBPOPN \_\_CUR\_ASTH\_C=1;WEIGHT \_CHILDWT\_M\_YEARS;

CLASS CAGE3CAT MGT\_CLAS\_CAT;

TABLES CAGE3CAT\*MGT\_CLAS\_CAT;

TEST CHISQ;

OUTPUT / TABLECELL=DEFAULT FILENAME=CAGE3CAT\_GROUP REPLACE;

RUN;

**/\* SAS Code for 3 age Group \*/**

PROC SURVEYFREQ DATA =ACBS\_CHILD\_18\_20 NOMCAR;

STRATA SURVEY\_YEAR \_STSTR ;

CLUSTER \_PSU ;

WEIGHT \_CHILDWT\_M\_YEARS;

TABLES CAGE3CAT \* MGT\_CLAS\_CAT / ROW CL CHISQ COL ;

Run;

**/\* SAS Code for CURRENT asthma only\*/**

PROC SURVEYFREQ DATA =ACBS\_CHILD\_18\_20 NOMCAR;

STRATA  SURVEY\_YEAR  \_STSTR  ;

CLUSTER  \_PSU ;

WEIGHT   \_CHILDWT\_M\_YEARS;

TABLES  \_\_CUR\_ASTH\_C \* MGT\_CLAS\_CAT  / ROW CL CHISQ COL;

Run;

**Table A. Child Asthma Call-back Survey Sample Size by Year and State**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **States** | **2018$** | **2019β** | **2020**¥ | **Sample size** |
| **California** | 41 | 51 | 22 | 114 |
| **Connecticut** | 52 | 48 | 120 | 220 |
| **Florida** | 79 | 97 | 65 | 241 |
| **Georgia** | 72 | 20 | 81 | 173 |
| **Hawaii** | 48 | 42 | 42 | 132 |
| **Indiana** | 42 | 39 | 62 | 143 |
| **Kansas** | 46 | 62 | 44 | 152 |
| **Michigan** | 104 | 97 | 67 | 268 |
| **Minnesota** | 103 | 77 | 76 | 256 |
| **Missouri** | 25 | 39 | 72 | 136 |
| **Montana** | 27 | 32 | 28 | 87 |
| **Nebraska** | 69 | 67 | 64 | 200 |
| **New Hampshire\*** | - | 41 | 63 | 104 |
| **New Mexico** | 39 | 34 | 52 | 125 |
| **New York** | 51 | 17 | 40 | 108 |
| **Ohio** | 78 | 42 | 61 | 181 |
| **Oregon\*\*** | 44 | 38 | - | 82 |
| **Pennsylvania** | 43 | 37 | 35 | 115 |
| **Rhode Island** | 24 | 25 | 46 | 95 |
| **Texas\*\*** | - | 50 | 135 | 185 |
| **Utah** | 92 | 114 | 85 | 291 |
| **Vermont** | 54 | 42 | 85 | 181 |
| **Wisconsin** | 33 | 25 | 34 | 92 |
| **Puerto Rico** | 72 | 60 | 66 | 198 |
|  |  |  |  |  |
| **Total** | **1238** | **1196** | **1445** | **3879** |

**Notes:**

\*Only states that have records for all three years (2018, 2019, and 2020) are included, except for New Hampshire, Oregon, and Texas.

\*\*New Hampshire and Texas have data for 2019 and 2020 only; Oregon has data for 2018 and 2019 only.

$Data quality response rate for 2018 is available at: [2018 Behavioral Risk Factor Surveillance System Asthma Call-Back Survey Summary Data Quality Report (cdc.gov)](https://www.cdc.gov/brfss/acbs/2018/pdf/sdq_report_acbs_18-508.pdf)

βData quality response rate for 2019 is available at: [2019 Behavioral Risk Factor Surveillance System Asthma Call-back Survey Summary Data Quality Report (cdc.gov)](https://www.cdc.gov/brfss/acbs/2019/pdf/sdq_report_acbs_19-508.pdf).

¥Data quality response rate for 2020 can be found in the [2020 Summary Data Quality Report](https://www.cdc.gov/brfss/acbs/2020/pdf/sdq_report_acbs_20-508.pdf).