

## Introducing the Commonwealth Institute of Kentucky's Behavioral Risk Factor Surveillance System (BRFSS) Data

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### 1. Background

The Centers for Disease Control and Prevention (CDC) started the state-based Behavioral Risk Factor Surveillance System's (BRFSS) health-related telephone surveys in 1984. The BRFSS collects data from each state regarding U.S. adult residents' health-related risk behaviors, chronic health conditions, and use of preventive services. States are required to conduct at least 2,500 interviews, and the BRFSS completes more than 400,000 interviews each year in order to have enough responses for weighting purposes. Each state submits respondent data to the CDC for state-specific agglomeration. The CDC provides the post-agglomerated data in standard tabulations to the states. The final results are published at the end of the year (See: <https://www.cdc.gov/brfss/about/index.htm>).

### 2. BRFSS Survey Data and Documentation

BRFSS has four types of datasets:

- **Annual Survey Data**

The BRFSS collects annual surveillance data on risk behavior from each state and U.S. territory through telephone interviews. BRFSS started collecting data in 1984. The aggregated annual survey data can be downloaded at no charge at the CDC webpage: [https://www.cdc.gov/brfss/annual\\_data/annual\\_data.htm](https://www.cdc.gov/brfss/annual_data/annual_data.htm). The data documentation and questionnaires are also available at the link.

- **Asthma Call-back Survey Data**

The Asthma Call-Back Survey (ACBS) is conducted about two weeks following the BRFSS survey. The BRFSS respondents who report an asthma diagnosis are considered for the ACBS. In 2005, the ACBS began on a small scale with three states. Ever since its initiation, the ACBS has been conducted annually. Every year, most states take part in the ACBS. The ACBS data, documentation, and prevalence table can be downloaded free of charge at the CDC webpage: <https://www.cdc.gov/brfss/acbs/index.htm>.

- **SMART: City and County Survey Data**

The Selected Metropolitan/Micropolitan Area Risk Trends (SMART) data is a subset of BRFSS aggregated data that is produced to provide specific local-area estimates. These

local areas are identified as metropolitan or micropolitan statistical areas (MMSAs) as per the definition by the Office of Management and Budget (OMB). The BRFSS data are used to produce state-level estimates, whereas the SMART project is used to produce small area-level estimates for MMSAs. The SMART data and documentation for the years 2002–2020 can be downloaded free of charge at:

[https://www.cdc.gov/brfss/smart/Smart\\_data.htm](https://www.cdc.gov/brfss/smart/Smart_data.htm).

- **GIS Maps Data**

To visually compare the prevalence data for states, territories, and local areas, the CDC has created a geographic information systems (GIS) mapping tool using the BRFSS results. The files contain BRFSS-mapped data for both the states and MMSAs. The GIS data and documentation for the years 2002–2010 can be downloaded free of charge at the CDC webpage: [https://www.cdc.gov/brfss/gis/gis\\_maps.htm](https://www.cdc.gov/brfss/gis/gis_maps.htm).

### 3. Questionnaire

The CDC collaborates with U.S. states and territories (the District of Columbia, Puerto Rico, and the U.S. Virgin Islands) public health agencies to develop the BRFSS questionnaire.

The BRFSS questionnaire has three parts:

- the core, which includes fixed core, rotating core, and emerging core
- optional modules
- state-added questions

The questionnaire for each year is available at:

<https://www.cdc.gov/brfss/questionnaires/index.htm>.

### 4. Statistical Brief

To provide guidance for BRFSS coordinators and data users, CDC-BRFSS publishes statistical briefs for different modules (e.g., industry and occupation optional module), variables (e.g., sexual orientation, gender id, sex, sex at birth) and questions (e.g., breast cancer screening question). CDC-BRFSS statistical briefs are available at

[https://www.cdc.gov/brfss/data\\_documentation/statistic\\_brief.htm](https://www.cdc.gov/brfss/data_documentation/statistic_brief.htm).

### 5. Commonwealth Institute of Kentucky's (CIK) BRFSS Data

#### 5.1. Years of Data and codebook

The CIK has BRFSS:

- national datasets for the years: 2006 – 2015  
and
- Kentucky State datasets for the years: 2006 – 2016

Codebooks are available from 2001 to 2015.

## 5.2. Data Format

The national datasets are in SAS format, and the Kentucky state datasets are in both SAS and STATA format.

## 5.3. Components of the Data

The components of the latest data are stated below:

Note: SAS variable names are in parentheses. The variables description here are from the 2015 BRFSS. Other years are similar to these descriptions.

- **Record Identification**
  - State FIPS Code (*\_STATE*)
  - File Month (*FMONTH*)
  - Interview Date (*IDATE*)
  - Interview Month (*IMONTH*)
  - Interview Day (*IDAY*)
  - Interview Year (*IYEAR*)
  - Final Disposition (*DISPCODE*)
  - Annual Sequence Number (*SEQNO*)
  - Primary Sampling Unit (*\_PSU*)
- **Land Line Introduction**
  - Correct Telephone Number (*CTELENUM*)
  - Is This a Private Residence (*PVTRES1*)
  - Do You Live in College Housing (*OLGHOUS*)
  - Do You Reside in (State) (*STATERES*)
  - Is This a Cellular Telephone (*CELLFON3*)
  - Are You 18 Years of Age or Older (*LADULT*)
  - Number of Adults in Household (*NUMADULT*)
  - Number of Adult Men in Household (*NUMMEN*)
  - Number of Adult Women in Household (*NUMWOMEN*)
- **Cell phone introduction**
  - Is this Phone Number (*CTELNUM1*)
  - Is this a Cellular Telephone (*CELLFON2*)
- **Section 1 Health status**
  - General Health (*GENHLTH*)
- **Section 2 Healthy Days — Health Related Quality of Life**
  - Number of Days Physical Health Not Good (*PHYSHLTH*)

- Number of Days Mental Health Not Good (*MENTHLTH*)
- Poor Physical or Mental Health (*POORHLTH*)
- **Section 3 Health Care Access**
  - Have any Health Care Coverage (*HLTHPLN1*)
  - Multiple Health Care Professionals (*PERSDOC2*)
  - Could Not See Doctor Because of Cost (*MEDCOST*)
  - Length of Time Since Last Routine Checkup (*CHECKUP1*)
- **Section 4 Hypertension awareness**
  - Ever Told Blood Pressure High (*BPHIGH4*)
  - Currently Taking Blood Pressure Medication (*BPMEDS*)
- **Section 5 Cholesterol awareness**
  - Ever Had Blood Cholesterol Checked (*BLOODCHO*)
  - How Long since Cholesterol Checked (*CHOLCHK*)
  - Ever Told Blood Cholesterol High (*TOLDHI2*)
- **Section 6 Chronic health conditions**
  - Ever Diagnosed with Heart Attack (*CVDINFR4*)
  - Ever Diagnosed with Angina or Coronary Heart Disease (*CVDCRHD4*)
  - Ever Diagnosed with a Stroke (*CVDSTRK3*)
  - Ever Told Had Asthma (*ASTHMA3*)
  - Still Have Asthma (*ASTHNOW*)
  - Ever Told You Had Skin Cancer (*CHCSCNCR*)
  - Ever Told You Had Any Other Types of Cancer (*CHCOCNCR*)
  - Ever Told You Have Chronic Obstructive Pulmonary Disease, Emphysema or chronic bronchitis (*CHCCOPD1*)
  - Told Have Arthritis (*HAVARTH3*)
  - Ever Told You Had a Depressive Disorder (*ADDEPEV2*)
  - Ever Told You Have Kidney Disease (*CHCKIDNY*)
  - Ever Told You Have Diabetes (*DIABETE3*)
  - Age When Told Diabetic (*DIABAGE2*)
- **Section 7 Demographic**
  - Respondents Sex (*SEX*)
  - Marital Status (*MARITAL*)
  - Education Level (*EDUCA*)
  - Own or Rent Home (*RENTHOM1*)
  - Household Telephones (*NUMHHOL2*)
  - Residential Phones (*NUMPHON2*)
  - Do You Have a Cell Phone for Personal Use (*CPDEMO1*)
  - Are You a Veteran (*VETERAN3*)
  - Employment Status (*EMPLOY1*)
  - Number of Children in Household (*CHILDREN*)
  - Income Level (*INCOME2*)
  - Internet Use in The Past 30 Days (*INTERNET*)
  - Reported Weight in Pounds (*WEIGHT2*)

- Reported Height in Feet and Inches (*HEIGHT3*)
- Pregnancy Status (*PREGNANT*)
- Activity Limitation Due to Health Problems (*QLACTLM2*)
- Health Problems Requiring Special Equipment (*USEEQUIP*)
- Blind or Difficulty Seeing (*BLIND*)
- Difficulty Concentrating or Remembering (*DECIDE*)
- Difficulty Walking or Climbing Stairs (*DIFFWALK*)
- Difficulty Dressing or Bathing (*DIFFDRES*)
- Difficulty Doing Errands Alone (*DIFFALON*)
- **Section 8 Tobacco use**
  - Smoked at Least 100 Cigarettes (*SMOKE100*)
  - Frequency of Days Now Smoking (*SMOKDAY2*)
  - Stopped Smoking in Past 12 months (*STOPSMK2*)
  - Interval Since Last Smoked (*LASTSMK2*)
  - Use of Smokeless Tobacco Products (*USENOW3*)
- **Section 9 Alcohol consumption**
  - Days in Past 30 Had Alcoholic Beverage (*ALCDAY5*)
  - Avg Alcoholic Drinks Per Day in Past 30 (*AVEDRNK2*)
  - Binge Drinking (*DRNK3GE5*)
  - Most Drinks on Single Occasion Past 30 Days (*MAXDRNKS*)
  - How Many Times Did You Drink 100 Percent Pure Fruit Juices (*FRUITJU1*)
- **Section 10 Fruits & vegetables**
  - How Many Times Did You Eat Pure Fruit Juices (*FRUITJU1*)
  - How Many Times Did You Eat Fruit (*FRUIT1*)
  - How Many Times Did You Eat Beans or Lentils (*FVBEANS*)
  - How Many Times Did You Eat Dark Green Vegetables (*FVGREEN*)
  - How Many Times Did You Eat Orange-colored Vegetables (*FVORANG*)
  - How Many Times Did You Eat Other Vegetable (*VEGETAB1*)
- **Section 11 Exercise (physical activity)**
  - Exercise in the Past 30 Days (*EXERANY2*)
  - Type of Physical Activity (*EXTRACT11*)
  - How Many Times Per Month Walking, Running, Jogging, or Swimming (*EXEROFT1*)
  - Minutes or Hours Walking, Running, Jogging, or Swimming (*EXERHMM1*)
  - Other Type of Physical Activity Giving Most Exercise During Past Month (*EXTRACT21*)
  - How Many Times Per Week or Per Month Walking, Running, Jogging, or Swimming During the Past Month (*EXEROFT2*)
  - Minutes or Hours Walking, Running, Jogging, or Swimming (*EXERHMM2*)
  - How Many Times Did You do Physical Activities or Exercises to Strengthen Your Muscles (*STRENGTH*)
- **Section 12 Arthritis Burden**
  - Limited Because of Joint Symptoms (*LMTJOIN3*)
  - Does Arthritis Affect Whether You Work (*ARTHDIS2*)

- Social Activities Limited Because of Joint Symptoms (*ARTHSOCL*)
- How Bad Was Joint Pain (*JOINPAIN*)
- **Section 13 Seatbelt Use**
  - How Often Use Seatbelts in Car (*SEATBELT*)
- **Section 14 Immunization**
  - Adult Flu Shot/Spray Past 12 MOS (*FLUSHOT6*)
  - When did You (Adult) Receive Your Most Recent Seasonal Flu Shot/Spray (*FLSHTMY2*)
  - Where did You Get Your Last Flu Shot/Vaccine (*IMFVPLAC*)
  - Pneumonia Shot Ever (*PNEUVAC3*)
- **Section 15 HIV/AIDS**
  - Ever Tested HIV (*HIVTST6*)
  - Month and Year of Last HIV Test (*HIVTSTD3*)
  - Location of Last HIV Test (*WHRTST10*)

## Modules

- **Module 1 Pre-Diabetes**
  - Had a Test for High Blood Sugar or Diabetes in the Past Three Years (*PDIABTST*)
  - Ever Been Told by a Doctor or Other Health Professional That You Have Pre-diabetes or Borderline Diabetes (*PREDIAB1*)
- **Module 2 Diabetes**
  - Taking Insulin (*INSULIN*)
  - How Often Check Blood for Glucose (*BLDSUGAR*)
  - How Often Check Feet for Sores or Irritations (*FEETCHK2*)
  - Times Seen Health Professional for Diabetes (*DOCTDIAB*)
  - Times Checked for Glycosylated Hemoglobin (*CHKHEMO3*)
  - Times Feet Check for Sores/irritations (*FEETCHK*)
  - Last Eye Exam Where Pupils Were Dilated (*EYEEXAM*)
  - Ever Told Diabetes Has Affected Eyes (*DIABEYE*)
  - Ever Taken Class in Managing Diabetes (*DIABEDU*)
- **Module 3 Healthy Days (Symptoms)**
  - How Many Days Hard to do Usual Activities in Past 30 Days (*PAINACT2*)
  - How Many Days Depressed in Past 30 Days (*QLMENTL2*)
  - How Many Days Felt Anxious in Past 30 Days (*QLSTRES2*)
  - How Many Days Full of Energy in Past 30 Days (*QLHLTH2*)
  - Provided Regular Care for Family or Friend (*CAREGIV1*)
- **Module 4 Caregiver**
  - Provided Regular Care for Family or Friend (*CAREGIV1*)
  - Relationship Of Person to Whom You Are Giving Care (*CRGVREL1*)
  - How Long Provided Care for Person (*CRGVLNG1*)
  - How Many Hours Do You Provide Care for Person (*CRGVHRS1*)

- What Is the Major Health Problem, Illness, Disability for Care for Person (*CRGVPRB1*)
- Managed Personal Care (*CRGVPEERS*)
- Managed Household Tasks (*CRGVHOUS*)
- Which Support Do You MOST Need That You Are Not Getting (*CRGVMST2*)
- Do You Expect to Have a Relative You Will Need to Provide Care for (*CRGVEXPT*)
- **Module 5 Visual Impairment and Access to Eye Care**
  - Difficulty Recognizing Friend Across Street (*VIDFCLT2*)
  - Difficulty Reading Typed Text (*VIREDF3*)
  - Visual Impairment and Access to Eye Care (*VIPRFVS2*)
  - Reason Did Not Use Eye Doc Past 12 MOS (*VINOCRE2*)
  - Visual Impairment and Access to Eye Care (*VIEYEXM2*)
  - Eye Care Health Insurance (*VIINSUR2*)
  - Hlth Care Pro Said Now Have Cataracts (*VICTRCT4*)
  - Hlth Care Pro Ever Said Have Glaucoma (*VIGLUMA2*)
  - Hlth Care Pro Ever Said Have Macular Degeneration (*VIMACDG2*)
- **Module 6 Cognitive Decline**
  - Have You Experienced Confusion or Memory Loss That is Happening More Often or is Getting Worse (*CIMEMLOS*)
  - Given up Day-to-day Chores Due to Confusion or Memory Loss (*CDHOUSE*)
  - Need Assistance with Day-to-day Activities Due to Confusion or Memory Loss (*CDASSIST*)
  - When You Need Help with Day-to-day Activities Are You Able to Get It (*CDHELP*)
  - Does Confusion or Memory Loss Interfere with Work or Social Activities (*CDSOCIAL*)
  - Have You Discussed Your Confusion or Memory Loss with a Health Care Professional (*CDDISCUS*)
- **Module 7 Sodium or Salt-Related Behavior**
  - Watching Sodium or Salt Intake (*WTCHSALT*)
  - How Long Watching Salt/Sodium Intake (*LONGWTCH*)
  - Doctor Advised Reduced Sodium/Salt Intake (*DRADVISE*)
- **Module 8 Adult Asthma History**
  - Age at Asthma Diagnosis (*ASTHMAGE*)
  - Asthma During Past 12 Months (*ASATTACK*)
  - Emergency Asthma Care During Past 12 Months (*ASERVIST*)
  - Urgent Asthma Treatment During Past 12 Months (*ASDRVIST*)
  - Routine Asthma Care During Past 12 Months (*ASRCHKUP*)
  - Activities Limited Because of Asthma During Past 12 Months (*ASACTLIM*)
  - Asthma Symptoms During Past 30 Days (*ASYMPTOM*)
  - Sleep Difficulty Because of Asthma During Past 30 Days (*ASNOSLEP*)
  - Days Used Prescribed Preventative Asthma Med in Past 30 Days (*ASTHMED3*)
  - Times Used Asthma Inhaler During an Attack in Past 30 Days (*ASINHALR*)
- **Module 9 Cardiovascular Health**

- Outpatient Rehab After Heart Attack Hosp stay (*HAREHAB1*)
- Outpatient Rehab after Hosp Stay for Stroke (*STREHAB1*)
- Take Aspirin Daily or Every Other Day (*CVDASPRN*)
- Health Makes Taking Aspirin Unsafe (*ASPUNSAF*)
- Take Aspirin to Relieve Pain (*RLIVPAIN*)
- Take Aspirin to Reduce Chance of Heart Attack (*RDUCHART*)
- Take Aspirin to Reduce Chance of Stroke (*RUCSTRK*)
- **Module 10 Arthritis Management**
  - What Can You Do Because of Arthritis or Joint Symptoms (*ARTTODAY*)
  - Dr. Suggest Lose Weight for Arthritis or Joint Symptoms (*ARTHWTG*)
  - Dr. Suggest Use of Physical Activity or Exercise for Arthritis or Joint Symptoms (*ARTHEXER*)
  - Ever Taken Class in Managing Arthritis or Joint Symptoms (*ARTHEDU*)
- **Module 11 Tetanus Diphtheria (TDAP) (Adults)**
  - Received Tetanus Shot Since 2005 (*TETANUS*)
- **Module 12 Adult Human Papillomavirus (HPV) - Vaccination**
  - Have You Ever Had the HPV Vaccination (*HPVADVC2*)
  - How Many HPV Shots Did You Receive (*HPVADSHT*)
- **Module 13 Shingles (Zostavax or ZOS)**
  - Have You Ever Had the Shingles or Zoster Vaccine (*SHINGLE2*)
- **Module 14 Breast and Cervical Cancer Screening**
  - Have You Ever Had a Mammogram (*HADMAM*)
  - How Long Since Last Mammogram (*HOWLONG*)
  - Ever Had a Pap Test (*HADPAP2*)
  - How Long Since Last Pap Test (*LASTPAP2*)
  - Have You Ever Had an HPV Test (*HPVTEST*)
  - How Long Since Your Last HPV Test (*HPLSTTST*)
  - Had Hysterectomy (*HADHYST2*)
- **Module 15 Clinical Breast Exam for Breast Cancer Screening**
  - Ever Had Breast Physical Exam by Doctor (*PROFEXAM*)
  - How Long Since Last Breast Physical Exam (*LENGEXAM*)
- **Module 16 Colorectal Cancer Screening**
  - Ever Had Blood Stool Test Using Home Kit (*BLDSTOOL*)
  - Time Since Last Blood Stool Test (*LSTBLDS3*)
  - Ever Had Sigmoidoscopy/Colonoscopy (*HADSIGM3*)
  - Was Your Last Test a Sigmoidoscopy or Colonoscopy (*HADSGCO1*)
  - Time Since Last Sigmoidoscopy/Colonoscopy (*LASTSIG3*)
- **Module 17 Prostate Cancer Screening**
  - Has a Health Professional Ever Talked with You About the Advantages of the PSA Test (*PCPSAAD2*)
  - Has a Health Professional Ever Talked with You About the Disadvantages of the PSA Test (*PCPSADI1*)
  - Has a Doctor Ever Recommended That You Have a PSA Test (*PCPSARE1*)



- Ever Had PSA Test (*PSATEST1*)
- Time Since Last PSA Test (*PSATIME*)
- What Was the Main Reason You Had This PSA Test (*PCPSARS1*)
- **Module 18 Prostate Cancer Screening Decision Making**
  - Why Was PSA Test Done (*PCPSADE1*)
  - Who Made the Decision with You to Have PSA Test (*PCDMDECN*)
- **Module 20 Social Context**
  - Times Past 12 Months Worried/Stressed About Having Enough Money to Pay Your Rent/Mortgage (*SCNTMNY1*)
  - Times Past 12 Months Worried/Stressed About Having Enough Money to Buy Nutritious Meals (*SCNTMEL1*)
  - How Are You Generally Paid for The Work You Do (*SCNTPAID*)
  - How Many Hours Per Week Do You Work (*SCNTWRK1*)
  - How Were You Generally Paid for The Work You Did (*SCNTLPAD*)
  - How Many Hours Per Week Did You Work (*SCNTLWK1*)
- **Module 21 Sexual Orientation and Gender Identity**
  - Sexual Orientation or Gender Identity (*SXORIENT*)
  - Do You Consider Yourself to be Transgender (*TRNSGNDR*)
- **Module 22 Random Child Selection**
  - Gender of Child (*RCSGENDR*)
  - Relationship to Child (*RCSRLTN2*)
- **Module 23 Childhood Asthma Prevalence**
  - Hlth Pro Ever Said Child Has Asthma (*CASTHDX2*)
  - Childhood Asthma Prevalence (*CASTHNO2*)
- **Module 24 Emotional Support and Life Satisfaction**
  - How Often Get Emotional Support Needed (*EMTSUPRT*)
  - Satisfaction With Life (*LSATISFY*)
- **Module 25 Anxiety and Depression**
  - Days Had Little Pleasure Doing Things (*ADPLEASR*)
  - Days Felt Down, Depressed or Hopeless (*ADDOWN*)
  - Days Had Trouble with Sleep (*ADSLEEP*)
  - Days Were Tired or Had Little Energy (*ADENERGY*)
  - Days Ate too Little or too Much (*ADEAT1*)
  - Days Felt Like Failure or Let Family Down (*ADFAIL*)
  - Days Had Trouble Concentrating (*ADTHINK*)
  - Days Talked to Move Slower or Faster Than Usual (*ADMOVE*)
  - Receiving Medicine or Treatment from Health Pro for Emotional Problem (*MISTMNT*)
  - Ever Told You Had an Anxiety Disorder (*ADANXEV*)
- **Questionnaire Version**
  - Questionnaire Version Identifier (*QSTVER*)
  - Language Identifier (*QSTLANG*)
- **Exercise (Physical Activity)**

- First Activity Other Response Description (*EXACTOT1*)
- Second Activity Other Response Description (*EXACTOT2*)
- **Weighting Variables**
  - Metropolitan Status Code (*MSCODE*)
  - Sample Design Stratification Variable (*\_STSTR*)
  - Stratum Weight (*\_STRWT*)
  - Raw Weighting Factor Used in Raking (*\_RAWRAKE*)
  - Design Weight Use in Raking (*\_WT2RAKE*)
- **Child Demographic Variables**
  - Child Hispanic, Latino/a, or Spanish Origin Calculated Variable (*\_CHISPNC*)
  - Child Non-Hispanic Race Including Multiracial (*\_CRACE1*)
  - Preferred Child Race Categories (*\_CPRACE*)
  - Final child weight: Land-line and Cell-Phone data (*\_CLLCPWT*)
  - Dual Phone Use Categories (*\_DUALUSE*)
  - Dual Phone Use Correction Factor (*\_DUALCOR*)
  - Final weight: Land-line and Cell-phone Data (*\_LLCPWT*)
- **Calculated Variables**
  - Adults with Good or Better Health (*\_RFHLTH*)
  - Respondents Aged 18-64 with Health Care Coverage (*\_HCVU651*)
  - High Blood Pressure Calculated Variable (*\_RFHYPE5*)
  - Cholesterol Checked Calculated Variable (*\_CHOLCHK*)
  - High Cholesterol Calculated Variable (*\_RFCHOL*)
  - Ever had CHD or MI (*\_MICHD*)
  - Lifetime Asthma Calculated Variable (*\_LTASTH1*)
  - Computed Asthma Status (*\_ASTHMS1*)
  - Respondents Diagnosed with Arthritis (*\_DRDXAR1*)
  - Computed Preferred Race (*\_PRACE1*)
  - Calculated non-Hispanic Race Including Multiracial (*\_MRACE1*)
  - Hispanic, Latino/a, or Spanish Origin Calculated Variable (*\_HISPANC*)
  - Computed Race-Ethnicity Grouping (*\_RACE*)
  - Create Computed Non-Hispanic Whites/All Others Race Categories Race/Ethnic Group Codes Used in Post-Stratification Variable (*\_RACEG21*)
  - Computed Five Level Race/Ethnicity Category (*\_RACEGR3*)
  - Computed Race Groups Used for Internet Prevalence Tables (*\_RACE\_G1*)
  - Reported Age in Five-year Age Categories Calculated Variable (*\_AGEG5YR*)
  - Reported Age in Two Age Groups Calculated Variable (*\_AGE65YR*)
  - Imputed Age Value Collapsed Above 80 (*\_AGE80*)
  - Imputed Age in Six Groups (*\_AGE\_G*)
  - Computed Height in Inches (*HTIN4*)
  - Computed Height in Meters (*HTM4*)
  - Computed Weight in Kilograms (*WTKG3*)
  - Computed Body Mass Index (*\_BMI5*)
  - Computed Body Mass Index Categories (*\_BMI5CAT*)

- Overweight or Obese Calculated Variable (*\_RFBMI5*)
- Computed Number of Children in Household (*\_CHLDCNT*)
- Computed Level of Education Completed Categories (*\_EDUCAG*)
- Computed Income Categories (*\_INCOMG*)
- Computed Smoking Status (*\_SMOKER3*)
- Current Smoking Calculated Variable (*\_RFSMOK3*)
- Drink any Alcoholic Beverages in Past 30 Days (*DRNKANY5*)
- Computed Drink-Occasions-per-day (*DROCDY3\_*)
- Binge Drinking Calculated Variable (*\_RFBING5*)
- Computed Number of Drinks of Alcohol Beverages Per Week (*\_DRNKWEK*)
- Heavy Alcohol Consumption Calculated Variable (*\_RFDRHV5*)
- Computed Fruit Juice Intake in Times Per Day (*FTJUDA1\_*)
- Computed Fruit Intake in Times Per Day (*FRUTDA1\_*)
- Computed Bean Intake in Times Per Day (*BEANDAY\_*)
- Computed Dark Green Vegetable Intake in Times Per Day (*GRENDAY\_*)
- Computed Orange-Colored Vegetable Intake in Times Per Day (*ORNGDAY\_*)
- Computed Other Vegetable Intake in Times Per Day (*VEGEDA1\_*)
- The Number of Missing Fruit Responses (*\_MISFRTN*)
- The Number of Missing Vegetable Responses (*\_MISVEGN*)
- Missing any Fruit Responses (*\_FRTRESP*)
- Missing any Vegetable Responses (*\_VEGRES*)
- Total Fruits Consumed Per Day (*\_FRUTSUM*)
- Total Vegetables Consumed Per Day (*\_VEGESUM*)
- Consume Fruit 1 or More Times Per Day (*\_FRTL1*)
- Consume Vegetables 1 or More Times Per Day (*\_VEGL1*)
- Reported Consuming Fruit >16 Per Day (*\_FRT16*)
- Reported Consuming Vegetables >23 Per Day (*\_VEG23*)
- Fruit Exclusion from Analyses (*\_FRUITEX*)
- Vegetable Exclusion from Analyses (*\_VEGETEX*)
- Leisure Time Physical Activity Calculated Variable (*\_TOTINDA*)
- Activity MET Value for First Activity (*METVL11\_*)
- Estimated Age-Gender Specific Maximum Oxygen Consumption (*MAXVO2\_*)
- Estimated Functional Capacity (*FC60\_*)
- Estimated Activity Intensity for First Activity (*ACTIN11\_*)
- Estimated Activity Intensity for Second Activity (*ACTIN21\_*)
- Minutes of First Activity (*PADUR1\_*)
- Minutes of Second Activity (*PADUR2\_*)
- Physical Activity Frequency Per Week for First Activity (*PAFREQ1\_*)
- Physical Activity Frequency Per Week for Second Activity (*PAFREQ2\_*)
- Minutes of Physical Activity Per Week for First Activity (*\_MINAC11*)
- Minutes of Physical Activity Per Week for Second Activity (*\_MINAC21*)
- Strength Activity Frequency Per Week (*STRFREQ\_*)
- Missing Physical Activity Data (*PAMISS1\_*)

- Minutes of Physical Activity Per Week for First Activity (*PAMIN11\_*)
- Minutes of Physical Activity Per Week for Second Activity (*PAMIN21\_*)
- Minutes of total Physical Activity Per Week (*PA1MIN\_*)
- Minutes of Vigorous Physical Activity Per Week for First Activity (*PAVIG11\_*)
- Minutes of Vigorous Physical Activity Per Week for Second Activity (*PAVIG21\_*)
- Minutes of Total Vigorous Physical Activity Per Week (*PA1VIGM\_*)
- Physical Activity Categories (*\_PACAT1*)
- Physical Activity Index (*\_PAINDX1*)
- 150 Minute Physical Activity Calculated Variable (*\_PA150R2*)
- 300 Minute Physical Activity Calculated Variable (*\_PA300R2*)
- 300 Minute Physical Activity 2-Level Calculated Variable (*\_PA30021*)
- Muscle Strengthening Recommendation (*\_PASTRNG*)
- Aerobic and Strengthening Guideline (*\_PAREC1*)
- Aerobic and Strengthening, 2-level (*\_PASTAE1*)
- Limited Usual Activities (*\_LMTACT1*)
- Limited Work Activities (*\_LMTWRK1*)
- Limited Social Activities (*\_LMTSCL1*)
- Always or Nearly Always Wear Seat Belts (*\_RFSEAT2*)
- Always Wear Seat Belts (*\_RFSEAT3*)
- Flu Shot Calculated Variable (*\_FLSHOT6*)
- Pneumonia Vaccination Calculated Variable (*\_PNEUMO2*)
- Ever been Tested for HIV Calculated Variable (*\_AIDTST3*)

## 5. Limitations

- *Response and Measurement Errors:* The BRFSS is based on information reported directly by respondents; therefore, it is susceptible to several errors. The wording of questions can elicit specific responses, resulting in what is known as “measurement error.” Similarly, the ability to recall details accurately varies depending on the person and how much time has passed since the event, they are attempting to recall. This can result in a “response error.”
- *Survey Language:* It is also possible that those who choose to participate are not the same as non-participants. Because interviews are primarily conducted in English and Spanish, adults who are unable to be interviewed in either language are excluded.
- *Owning a Landline Matters:* Households without telephones are not contacted. As a result, BRFSS findings can only be generalized to English- and Spanish-speaking adults living in telephone-equipped households.
- Since the aforementioned sources of bias are unlikely to change significantly from year to year, the results are comparable over time. This enables researchers to determine whether the prevalence of a particular health condition is increasing or decreasing over a certain time period.

- *BRFSS data is cross-sectional*: BRFSS respondents are not followed over time. Therefore, it is not possible to conduct individual-level longitudinal analysis using the data.

## 6. Studies conducted using the BRFSS Data

The peer-reviewed articles listed below are examples of studies that have been conducted in the last decade using BRFSS data to assess various public health issues.

Anderson, N. J., & Marcum, J. L. (2019). Using behavioral risk factor surveillance system data as an occupational health profile: Washington State janitors, 2011 to 2017. *Journal of occupational and environmental medicine*, 61(9), 747-753.

Bevan, G., Pandey, A., Griggs, S., Dalton, J. E., Zidar, D., Patel, S., & Al-Kindi, S. (2022). Neighborhood-level social vulnerability and prevalence of cardiovascular risk factors and coronary heart disease. *Current problems in cardiology*, 101182.

Guinn, A. S., Ports, K. A., Ford, D. C., Breiding, M., & Merrick, M. T. (2019). Associations between adverse childhood experiences and acquired brain injury, including traumatic brain injuries, among adults: 2014 BRFSS North Carolina. *Injury prevention*, 25(6), 514-520.

Jena, M. D., Marcello, P. W., Roberts, P. L., Read, T. E., Schoetz, D. J., Hall, J. F., & Ricciardi, R. (2016). Epidemiologic analysis of diverticulitis. *Clinics in Colon and Rectal Surgery*, 29(03), 258-263.

Matos-Moreno, A., Verdery, A. M., Mendes de Leon, C. F., De Jesús-Monge, V. M., & Santos-Lozada, A. R. (2022). Aging and the left behind: Puerto Rico and its unconventional rapid aging. *The Gerontologist*, 62(7), 964-973.

Moore, L. V., Dodd, K. W., Thompson, F. E., Grimm, K. A., Kim, S. A., & Scanlon, K. S. (2015). Using behavioral risk factor surveillance system data to estimate the percentage of the population meeting U.S. Department of Agriculture food patterns fruit and vegetable intake recommendations. *American journal of epidemiology*, 181(12), 979-988.

Sung, B., & Etemadifar, A. (2019). Multilevel analysis of socio-demographic disparities in adulthood obesity across the United States geographic regions. *Osong Public Health and Research Perspectives*, 10(3), 137.

Sung, B. (2021). Gender Difference in the Association Between E-Cigarette Use and Depression among U.S. Adults. *Osong public health and research perspectives*, 12(1), 13.

Weng, G., & Dunn, W. (2019). Effect of alcohol consumption on nonalcoholic fatty liver disease. *Translational Gastroenterology and Hepatology*, 4.