



Adverse Childhood Experiences Data Collection:

An Overview of the Behavioral Risk Factor Surveillance System (BRFSS)

Melanie Morse, MS^{1,2} and Melissa Stropolis, PhD¹

Children's Trust of South Carolina has produced a series of research briefs on adverse childhood experiences (ACEs). The research brief topics include the data collection process, an overview of ACEs, the prevalence of ACEs in various populations, and the relationship between ACEs and health and social outcomes.

In 2014 Children's Trust of South Carolina (herein Children's Trust) partnered with the South Carolina Department of Health and Environmental Control (DHEC) to collect data on adverse childhood experiences (ACEs). Children's Trust has produced a research brief to outline the ACE data collection process and highlight some of the important findings. This ACE research brief will focus on the system and process of collecting data in South Carolina. An invaluable tool for the measurement of health-related goals at the state and national levels, the Behavioral Risk Factor Surveillance System (BRFSS) is administered through the Centers for Disease Control and Prevention (CDC, n.d.). Children's Trust's partners at DHEC utilize the BRFSS to collect ACE data. This report gives an overview of the BRFSS background and history, participants, administration, content, and psychometric properties.

Background and History

The BRFSS is a cross-sectional, telephone-based survey of health-related risk behaviors, history of chronic health conditions, and preventative behaviors (CDC, 2014a). The survey was developed by the CDC to gather information on health risk behaviors at the state level. State-specific information collected through the BRFSS is often helpful in evaluating progress towards state-level health goals. Most surveys prior to the BRFSS were solely administered on a national level (CDC, 2014a).

The BRFSS was established in 1984 with data from 15 states based on a standard set of core questions that assessed smoking, alcohol use, physical inactivity, diet, hypertension, and seat-belt use. In 1988 the CDC introduced the first optional modules, which were designed to help states tailor the survey

to their specific needs and goals. By 1993 the BRFSS was being administered to participants throughout the United States, and the survey had been updated to include fixed core and rotating core questions (CDC, 2014a).

Today the BRFSS is administered on a more frequent basis (e.g., daily, monthly) and collects responses annually from all 50 states and the District of Columbia, American Samoa, Palau, Puerto Rico, the U.S. Virgin Islands and Guam (CDC, 2014a). In South Carolina, BRFSS data is collected on a daily basis. The BRFSS is the largest continually conducted health survey system in the world. In 2014 over 500,000 survey responses were collected (CDC, 2014b).

Participants

Non-institutionalized adults 18 years or older are randomly selected to take part in the survey. Participants are not compensated monetarily but are reminded that they are taking part in a rewarding endeavor that helps improve the health of U.S. residents. The number of interviews within each state is contingent upon funding and the size of regions, such as health districts, within each state (CDC, 2015b). In 2014 more than 11,000 South Carolinians participated in the BRFSS.

Administration

The survey is conducted year-round using random digit dialing (RDD) techniques on both landlines and cell phones, which have been a part of the BRFSS since 2011. On a national level, the CDC oversees the BRFSS. On a state level, the CDC partners with state health departments to either use in-house interviewers, outside telephone call centers, or universities to administer the BRFSS (CDC, 2015b). In South Carolina, the survey is managed by and administered by the University of South Carolina's Institute of Public Service and Policy Research.

1. Children's Trust of South Carolina

2. Department of Psychology, University of South Carolina



Survey Content

The BRFSS includes sets of questions that should be asked to all respondents as well as optional sets of questions that states may include based on their interests and goals. As such, the complete set of questions asked varies by state. Additionally, the BRFSS has space for four emerging core questions, such as questions on vaccine shortage or influenza-like illness (CDC, 2015b). Emerging core questions are used less often, typically when acute health threats arise.

Modules used in all states. For all surveyed areas the following are core modules: health status, healthy days, healthcare access, exercise, inadequate sleep, chronic health conditions (including physical and mental illnesses), demographics, tobacco use, alcohol consumption, immunization, seat-belt use, and HIV/AIDS (CDC, 2013). For all participating locations the following are rotating core modules: oral health, falls (only for respondents 45 years old or older), drinking and driving, breast and cervical cancer (only for female respondents), prostate cancer screening (only for male respondents 39 years or older), and colorectal cancer screening (only for respondents 49 years old and older).

Modules used in South Carolina. In the state of South Carolina, all of the modules described previously will be administered in the 2016 version of the survey along with the following modules: diabetes, healthcare access, pre-diabetes, random child selection, reactions to race, and ACEs (CDC, 2015c). The ACE questions have been added by the state of South Carolina and are not funded by the CDC, as they are not part of the BRFSS core or optional modules. Children's Trust funded the ACE data collection through the BRFSS in 2014 and 2015.

BRFSS Modules (CDC, 2015a)

Core – all health departments must administer these questions without modification to their wording.

- **Fixed** – a standard set of questions administered by all states. Includes questions related to demographics and current health behaviors such as tobacco use and seatbelt use.
- **Rotating** – comprised of two sets of questions administered in alternating years by all states.
- **Emerging** – questions assessing “late-breaking” issues that are included for one year and, subsequently, are evaluated to determine whether or not they will remain part of the core module.

Optional – questions on specific topics that a state may add to their survey. As with the core modules, these questions must be used without modification to their wording.

State-Added – questions on additional topics that a particular state elects to include, such as questions assessing health priorities specific to a state.

Validity and Reliability

In addition to being a well-known measure of important public health concerns, the validity and reliability of the BRFSS has been extensively studied and documented. In other words, researchers have studied whether the BRFSS is measuring what it is supposed to measure, and whether its findings are consistent across samples.

For example, the BRFSS results were compared to data from the National Health Interview Survey (NHIS; CDC, 2011) and the National Health and Nutrition Examination Survey (NHANES; CDC, 2009). However, there are some key differences among these three surveys. While the NHIS and NHANES collect data from fewer participants than the BRFSS, the three surveys collectively represent major ongoing health surveys in the U.S. Also, the BRFSS represents exclusively self-reported data, while the NHANES includes data from an in-person health examination. The comparison found that the BRFSS yielded similar prevalence estimates for the majority of selected health indicators and chronic diseases to the NHIS or NHANES surveys (Li, Balluz, Ford, Okoro, Zhao, & Pierannunzi, 2012). The participants included in the BRFSS were similar across domains (e.g., gender, age) compared to the NHIS and NHANES (Li et al., 2012).

Not only is the BRFSS a reliable measure of public health domains, but the survey also takes steps to enhance the validity of responses. Specifically, the BRFSS integrates multiple modes of data collection to enhance validity (Hu, Pierannunzi, & Balluz, 2011). For example, because many households have a cell phone in lieu of a landline (Blumberg & Luke, 2009), the CDC's inclusion of both landlines and cellphones in RDD helps to bolster the validity of the BRFSS results (Hu et al., 2011). A strength of the BRFSS lies in its ability not only to provide valid and reliable survey-level data regarding health priorities, but also to provide population-level data for many health-related matters.

Summary and Conclusions

The BRFSS is a powerful tool for the evaluation of health risk behaviors, clinical preventive health practices, and healthcare access that is collected across all 50 states, the District of Columbia, and U.S. territories (CDC, 2014a). Because data is collected at the state level, the BRFSS provides valuable information for states that may be used for setting health-related goals (e.g., *Healthy People 2020*; U.S. Department of Health and Human Services, 2015). The BRFSS has demonstrated acceptable reliability and validity (Hu et al., 2011; Li et al., 2012; Nelson, Powell-Griner, Town, & Kovar, 2003), meaning that its findings are consistent across samples and it measures what it is supposed to measure. Finally, as evidenced by the inclusion of cell phone and landline sampling in all 50 states, the BRFSS continues to evolve to address new challenges.



Acknowledgements

The authors would like to thank Chelsea Lynes, South Carolina's BRFSS Coordinator at the South Carolina Department of Health and Environmental Control, for her review of the document.

References

- Blumberg, S. J., & Luke, J. V. (2009). Reevaluating the need for concern regarding noncoverage bias in landline surveys. *American Journal of Public Health, 99*, 1806-1810.
- Centers for Disease Control and Prevention. (n.d.). *Behavioral Risk Factor Surveillance System: History* (CDC Publication CS232319F). Retrieved from <http://www.cdc.gov/brfss/factsheets/pdf/brfss-history.pdf>
- Centers for Disease Control and Prevention (2009). *About the National Health and Nutrition Examination Survey*. Retrieved from: http://www.cdc.gov/nchs/nhanes/about_nhanes.htm
- Centers for Disease Control and Prevention (2011). *About the National Health Interview Survey*. Retrieved from http://www.cdc.gov/nchs/nhis/about_nhis.htm
- Centers for Disease Control and Prevention (2013). *2014 Behavioral Risk Factor Surveillance System Questionnaire*. Retrieved from: http://www.cdc.gov/brfss/questionnaires/pdf-ques/2014_brfss.pdf
- Centers for Disease Control and Prevention (2014a). *About the Behavioral Risk Factor Surveillance System*. Retrieved from http://www.cdc.gov/brfss/about/about_brfss.htm
- Centers for Disease Control and Prevention (2014b). *BRFSS today: Facts and highlights*. Retrieved from: http://www.cdc.gov/brfss/about/brfss_today.htm
- Centers for Disease Control and Prevention (2015a). *BRFSS Questionnaires*. Retrieved from <http://www.cdc.gov/brfss/questionnaires/>
- Centers for Disease Control and Prevention (2015b). *BRFSS frequently asked questions (FAQs)*. Retrieved from http://www.cdc.gov/brfss/about/brfss_faq.htm
- Centers for Disease Control and Prevention (2015c). *Behavioral Risk Factor Surveillance Survey System: 2014 modules by state by data set & weight*. Retrieved from: <http://www.cdc.gov/brfss/questionnaires/state2014.htm>
- Hu, S. S., Pierannunzi, C., & Balluz, L. (2011). Integrating a multimode design into a national random-digit-dialed telephone survey. *Preventing Chronic Disease, 8*, A145. http://www.cdc.gov/pcd/issues/2011/nov/10_0230.htm
- Li, C., Balluz, L. S., Ford, E. S., Okoro, C. A., Zhao, G., & Pierannunzi, C. (2012). A comparison of prevalence estimates for selected health indicators and chronic diseases or conditions from the Behavioral Risk Factor Surveillance System, the National Health Interview Survey, and the National Health and Nutrition Examination Survey, 2007-2008. *Preventative Medicine, 54*, 381-387.
- Nelson, D. E., Powell-Griner, E., Town, M., & Kovar, M. G. (2003). A comparison of national estimates from the National Health Interview Survey and the Behavioral Risk Factor Surveillance System. *American Journal of Public Health, 93*, 1335-1341.
- U.S. Department of Health and Human Services (2015). *2020 topics and objectives – objectives A-Z*. Retrieved from: <http://www.healthypeople.gov/2020/topics-objectives>