

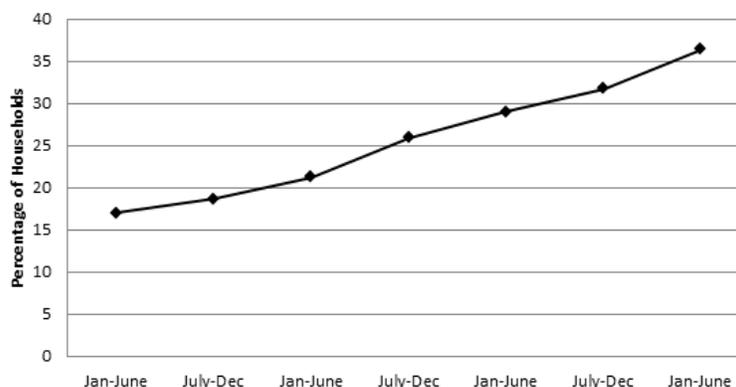
# Behavioral Risk Factor Surveillance System

## Improving Survey Methodology



Data from the National Center for Health Statistics show the steady rise in U.S. households that have cell phones only. Telephone surveys, including the Centers for Disease Control and Prevention (CDC)'s Behavioral Risk Factor Surveillance System (BRFSS), have had to add cell phones to their samples. This keeps the accuracy of these surveys in terms of representativeness, coverage, and validity of the samples.

National Center for Health Statistics Estimates of Cell Phone Only Households in the United States, 2008–2011



Source: Blumberg SJ, Luke JV. Wireless substitution: Early release estimates from the National Health Interview Survey, January– June 2011. Available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201112.pdf>. Accessed April 26, 2012.

*A more advanced method is being used called raking. It offers advantages over the previous post-stratification weighting. It allows more variables into the process to better reflect the total population. It also allows CDC to add in the new variable of telephone source.*

Adding cell phones to the survey samples is important because research shows people with cell phones only are different. It allows for them to be represented. They tend to be younger, rent instead of own their homes, are mostly Hispanic, and tend to be single. There are also differences in attitude and behaviors between cell phone only users and those with landline phones.

In 2004 an expert panel of survey methodologists recommended that BRFSS address the growing effects of cell phone only use by households. Recommendations included adding cell phones to the BRFSS sample and improving weighting and adjustment methods. CDC has been planning and testing these changes to be done with the release of the 2011 BRFSS dataset, expected in May 2012.



## Raking adjusts estimates within each state by using

- telephone source,
- detailed race and ethnicity,
- regions within states,
- education level,
- marital status,
- age group by gender,
- gender by race and ethnicity,
- age group by race and ethnicity, and
- homeowner status.

## About BRFSS

BRFSS, initiated by CDC in 1984, is a coordinated collection of state and local health surveys conducted by the 50 U.S. states, the District of Columbia, and six U.S. territories. Taken together, these surveys make up the largest ongoing telephone survey in the world; more than 430,000 interviews were conducted in 2011.

With technical and methodological assistance from CDC, state health departments use in-house interviewers or contract with telephone call centers to conduct the BRFSS surveys continuously through the year. The states use a standardized core questionnaire and optional modules, plus additional state-added questions.

The federal government, state governments, universities, private organizations, and researchers use BRFSS data to monitor public health. BRFSS data can help them to identify and track health behaviors and chronic conditions, track health objectives, evaluate disease prevention activities, and rapidly assess emerging health problems, such as novel influenza and influenza vaccination.

BRFSS is administered by the Division of Behavioral Surveillance in CDC's Public Health Surveillance and Informatics Program Office (proposed); Office of Surveillance, Epidemiology, and Laboratory Services.

## New Weighting Methodology: Raking

Since the 1980s, CDC has used a statistical method called post stratification to weight BRFSS survey data to simultaneously adjust survey respondent data to known proportions of age, race and ethnicity, gender, geographic region, or other known characteristics of a population. This type of weighting is important because it makes the sample more representative of the population and adjusts for nonresponse bias. In 2006, in accordance with the recommendations of the 2004 expert panel, CDC began testing a more sophisticated weighting method called iterative proportional fitting, or raking.

Raking has several advantages over post stratification. First, it allows the introduction of more demographic variables suggested by the BRFSS expert panel—such as education level, marital status, and home ownership—into the statistical weighting process than would have been possible with post stratification. This advantage reduces the potential for bias and increases the representativeness of estimates.

Second, raking allows for the incorporation of a now crucial variable—telephone source (landline or cell phone)—into the BRFSS weighting methodology.

Beginning with the 2011 dataset, raking will succeed post stratification as the sole BRFSS statistical weighting method.

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