2011 Hawaii BRFSS and beyond: A new beginning

Calendar year 2011 is a new beginning in the Hawaii BRFSS results. It is a new beginning because of two major changes, namely: 1) inclusion of cell phone respondents in the interview results and 2) application of iterative proportional fitting (IPF) or raking weighting methodology to the BRFSS dataset. These changes were made to improve coverage bias, non-response bias and overall survey error. Given these changes, the results of prior year Hawaii BRFSS cannot be compared with the 2011 Hawaii BRFSS or more recent year Hawaii BRFSS results.

Details:

The Hawaii BRFSS is part of the national BRFSS of Centers for Disease Control and Prevention (CDC). As such, the Hawaii BRFSS follows all the protocols and guidance of CDC/BRFSS. As early as 2005, a group of survey scientists and statisticians looked into the weighting methodology and coverage of BRFSS estimates. Their findings were presented at the national BRFSS conference in 2006 and formally published in the Survey Research Methods journal (see https://ojs.ub.uni-konstanz.de/srm/article/view/597). Similarly, to show the extent of cell phone usage and its effects on the health prevalence estimates, the National Health Interview Survey (NHIS), a national face-to-face survey also began tracking the use of wireless phones, better known as cell phones, as early as 2003 in the nation's households (see http://www.cdc.gov/nchs/ppt/nchs2012/LI-20_BLUMBERG.pdf).

Cell phone BRFSS

In Hawaii, for the calendar years 2008 to 2010 the cell phone BRFSS survey was piloted. This period was a developmental stage or exploratory feasibility study to determine if there would be sufficient participation in cell phone interviews and if such participation can be sustained. In this initial stage, only the core BRFSS survey questions were included. The required sample of completed interviews began at 250 and increased gradually. In addition, in 2010 selected optional modules and state added questions were included in some months of the survey. The outcome of this developmental stage demonstrated the feasibility of this data collection method. Response rates ranged from 6% to 8% and the item completion was high even when the length of the interview was increased to include optional and state added questions. By calendar year 2011, the cell phone interviews were increased to 1,200 and all the questions asked in landline BRFSS survey were also asked in the cell phone BRFSS survey.

Weighting methodology

Weighting is a procedure to adjust survey data so that the under or over-represented groups in a sample can be proportionally accounted for in the population estimate. For example, most of the Hawaii BRFSS respondents are women (59% of respondents); however, after applying the weights, the men to women percentage distribution is about equal at 50%.

The BRFSS data set of participating states and US territories are weighted in two steps, namely design weights and some "form of data weighting". The design weight is always part of the weighting. Considerations for the design weights are stratification values (probability of selection among strata), number of residential phones in the randomly selected household and number of adults in the randomly selected household. Prior to year 2011, the post-stratification method was used for the "some form of data weighting" . The post-stratification adjusts for non-coverage and non-response. It forces the sum of the weighted frequencies to equal the population estimates for the state subdivided by sex, age groups, race and region. In Hawaii, region is equivalent to county.

Advances in computer technology made it possible to use the iterative proportional fitting (IPF) or raking method of weighting replacing the post-stratification method. IPF allows for inclusion of many more demographic variables in the weighting, and the inclusion of cell phone samples as well as reduction of non-response bias.

Twelve demographic control margins (data sources) used in 2011 BRFSS

1. Age group by gender (Nielsen Company, Inc.)
2. Race/ethnicity (Nielsen Company, Inc.)
3. Education (American Community Survey (ACS))
4. Marital status (American Community Survey (ACS))
5. Tenure (rent or Own) (American Community Survey (ACS))
6. Gender (Nielsen Company, Inc.)
7. Age group by race/ethnicity (Nielsen Company, Inc.)
8. Phone usage groups (NHIS)
9. Region (county) (Nielsen Company, Inc.)
10. Region by age group (Nielsen Company, Inc.)
11. Region by gender (Nielsen Company, Inc.)
12. Region by race/ethnicity (Nielsen Company, Inc.)

For a more detailed explanation of the changes to the 2011 survey methodology please see:

Methodologic Changes in the Behavioral Risk Factor Surveillance System in 2011 and Potential Effects on Prevalence Estimates

Frequently Asked Questions about Changes to the Behavioral Risk Factor Surveillance System

Improving the Behavioral Risk Factor Survey Methodology Fact Sheet