

# BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM (BRFSS): CHANGES IN METHODS BEGINNING WITH 2011 DATA AND EXPECTED EFFECTS ON NEW MEXICO HEALTH INDICATOR ESTIMATES



Information from the New Mexico Department of Health for Epidemiologists and BRFSS data users

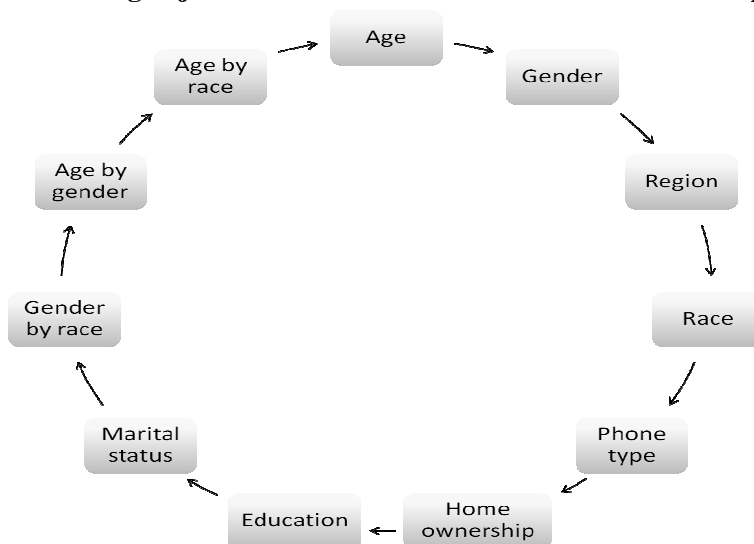
## CHANGES IN THE BRFSS METHODS

- **Beginning in 2011, standard BRFSS methods changed in two ways:**
  - Cell phone-only households were included in the sample
  - Responses were weighted using a method called “raking” and were weighted for region, age, gender, race/ethnicity, phone type, home ownership, education, marital status, gender by race, age by gender, and age by race
  - These changes will likely result in the BRFSS being more representative of the New Mexico population as a whole
- **How is this different from previous years?**
  - Previously, only land-line telephones were sampled and responses were weighted for age, gender, and region using post-stratification
- **Why is the CDC making these changes to the BRFSS now?**
  - Proportion of cell phone-only households is increasing and response rates to telephone surveys are decreasing<sup>1</sup>. In 2010, it was estimated that 27% of New Mexican adults were living in cell phone-only households<sup>2</sup>
  - Advances in computer capacity allow for more sophisticated methods
  - Raking allows for the inclusion of cell phone-only households, and likely reduces non-response bias<sup>3</sup>
  - The addition of cell phone-only households will improve survey coverage for certain population groups (e.g. populations who have lower incomes, lower educational attainment or are in younger age groups)<sup>1</sup>

## BRFSS weighting by raking vs. post-stratification:

- ✓ Post-stratification forces the number of adults in each possible combination of region, age group, and gender to equal U.S. Census estimates for New Mexico
- ✓ Post-stratification is limited by access to information on every possible combination of the weighting variables
- ✓ Unlike post-stratification, raking does not have this limitation. This means that raking is not as sensitive to small sample sizes and allows for the addition of other important weighting variables (e.g. phone type)
- ✓ Raking adjusts for each weighting variable individually in an iterative process of up to 75 cycles, or until data converge to U.S. Census estimates (Figure 1)

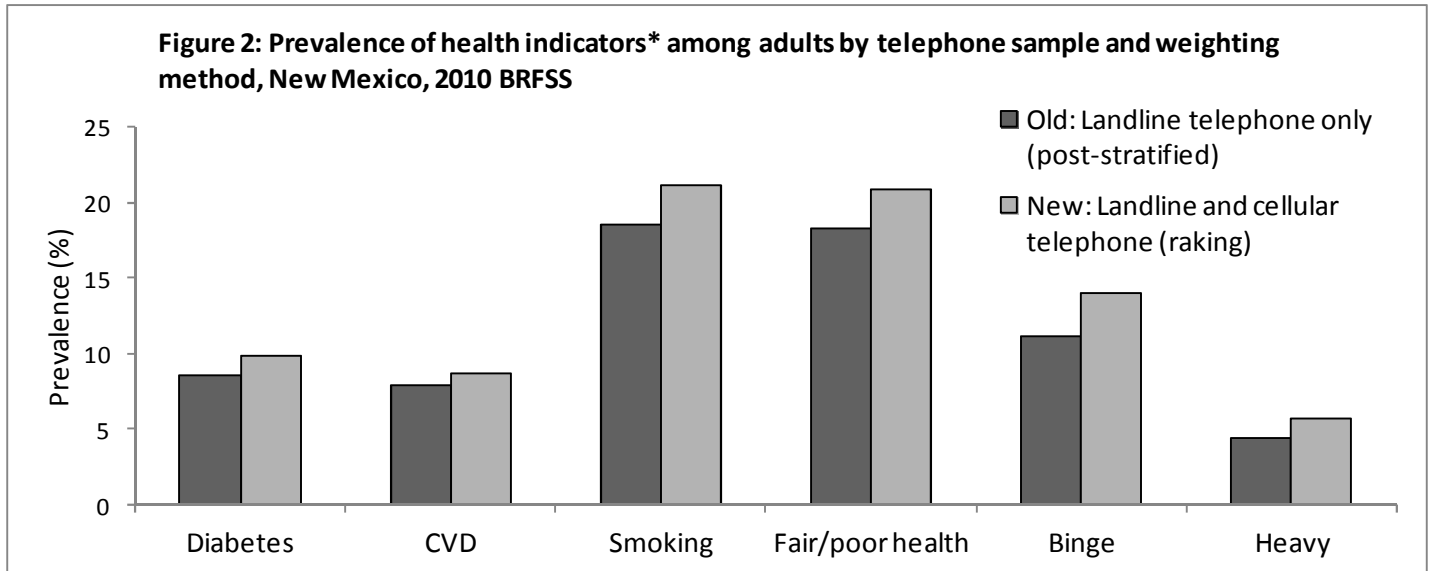
Figure 1: Raking adjusts for one variable at a time in an iterative process



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## EFFECT OF CHANGES IN METHODS ON PREVALENCE ESTIMATES IN NEW MEXICO

- A comparison of 2010 NM health indicator estimates calculated with the old methods to those calculated with the new found that:
  - Changes in estimates resulting from the new methods are generally small
  - Estimates of adults up-to-date for cancer screening (mammogram, Pap test and colorectal cancer screening) will **decrease** slightly due to the new methods (data not shown)
  - Similar to a national evaluation<sup>1</sup>, estimates of some risk behaviors and chronic conditions will **increase** due to the new methods (Figure 2)
  - For some indicators, the change was primarily due to raking, for others it was the inclusion of cell phones<sup>1</sup>



\*Diabetes = ever diagnosed with diabetes; CVD (cardiovascular disease) = ever diagnosed with heart attack, coronary heart disease, and/or stroke; smoking = current cigarette smoker; Fair/poor health = self-reported general health as fair or poor; Binge = binge drinking (on 1+ occasions in past month: Men  $\geq 5$  drinks, women  $\geq 4$  drinks); Heavy = heavy drinking (men: average  $\geq 2$  drinks/day and women: average  $\geq 1$  drink/day)

### TECHNICAL TIPS FOR NEW METHODS

- Continue to use the final weight variable (i.e. \_finalwt)
- Do not combine datasets that are weighted with different methods (e.g. 2010 & 2011)
- An evaluation of the 2010 NM BRFSS suggests that previous methods overestimated White, married and middle income (\$25,000-74,999) groups and underestimated groups that were unemployed, uninsured, and had less than a high school diploma. Health indicator estimates by these groups may change when using the new methods.

### COMMUNICATION STRATEGY SUGGESTIONS

Clear and consistent communication can reduce misinterpretation of changes in estimates. Communication strategies can be tailored to fit data needs, but suggestions include:

- When possible, include a “break” in trend lines between 2010 and 2011 estimates (2012 for questions only asked in even years)
- If a brief footnote is needed: “Beginning with 2011 estimates, the BRFSS updated its surveillance methods. Any shift in prevalence between 2010 and 2011 must be interpreted with caution, as it may be partially due to the

change in methods.”

- If more explanation is needed: “Occasional improvements in methods are a necessary part of all health surveys. The changes to the BRFSS methods are important to keep up with changes in cell phone use in the U.S. and take advantage of improved statistical procedures. Although prevalence estimates may shift when these methods are first adopted, it is likely that the trends in prevalence will continue in the years after 2011 in a similar pattern as trends 2010 and before.”

### References:

1. CDC. Methodologic changes in the behavioral risk factor surveillance system in 2011 and potential effects on prevalence estimates. MMWR 2012;61:410-3.
2. Blumberg SJ, et al. Wireless substitution: State-level estimates from the National Health Interview Survey, January 2007–June 2010. National health statistics reports; no 39. Hyattsville, MD: National Center for Health Statistics, 2011.
3. Battaglia MP, et al. Improving standard poststratification techniques for random-digit-dialing telephone surveys. Surv Res Methods. 2008;2:11–9.