Behavioral Risk Factor Surveillance System (BRFSS) Methods Changes

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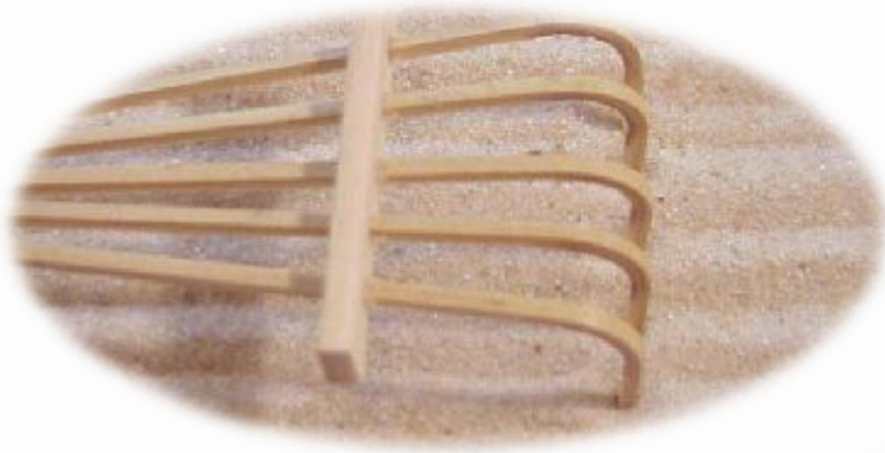
Oregon Public Health Division

Portland, Oregon

BRFSS Methods Changes

Raking

And cell phones

Goals of this Presentation

- Review the purpose of weighting BRFSS data
- Explain changes in BRFSS weighting and sampling methods
- Explain effect of changes on chronic disease and risk factor estimates

Oregon Behavioral Risk Factor Surveillance System: Overview

- BRFSS is an important source of information about health risk behaviors, preventive health practices, and health care access

- Data come from interviews of some adults in residential households each month

- Ongoing since 1988 in Oregon

Telephone Surveys (BRFSS, polls)
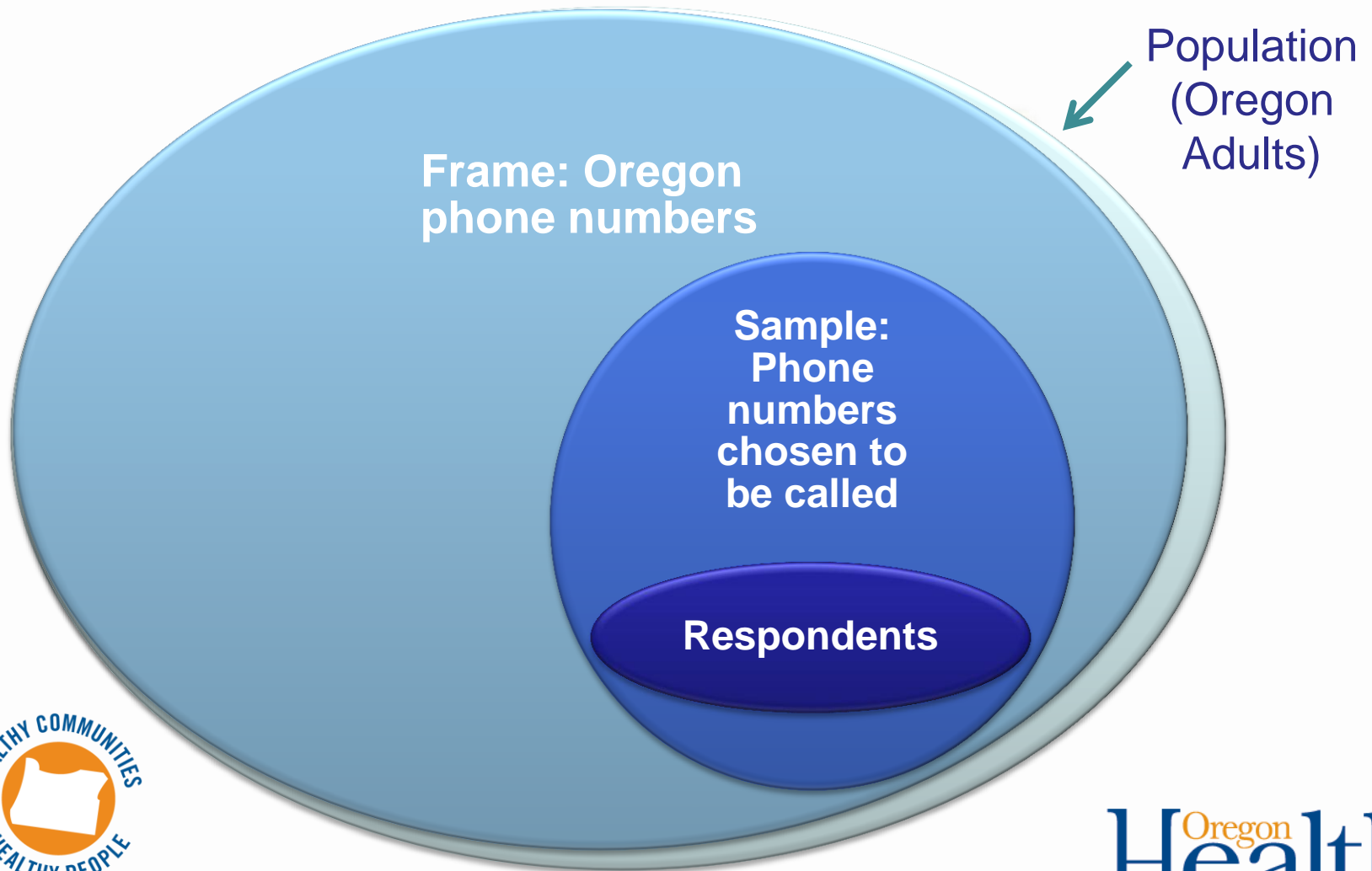
Why Weight the Data?

- As a group, do respondents "look like" the population?
  - What might cause them to look different?
- Weighting makes sure the information collected on BRFSS accurately represents the population

An Easy Example

- Sampling frame:
  - 1,000 people: 500 men and 500 women
- Sample:
  - 100 people: 52 men and 48 women
- Respondents:
  - 40 people: 10 men and 30 women.

An Easy Example, con't.

- The ratio of men to women in the base population is? **1:1**
- Among respondents the ratio of men to women is? **1:3**
  - What effect might this imbalance have on estimates?

The Early Years: "Classic" Weight

- Comprised of two parts:
  1. Chance of being selected
  2. Demographic factors to make sample "look like" population: age groups and sex

- Employed post-stratification
  - Simple and easy to do

- In effect 1991-2009*

* For Oregon. For U.S. data, the classic weight was used through 2010.
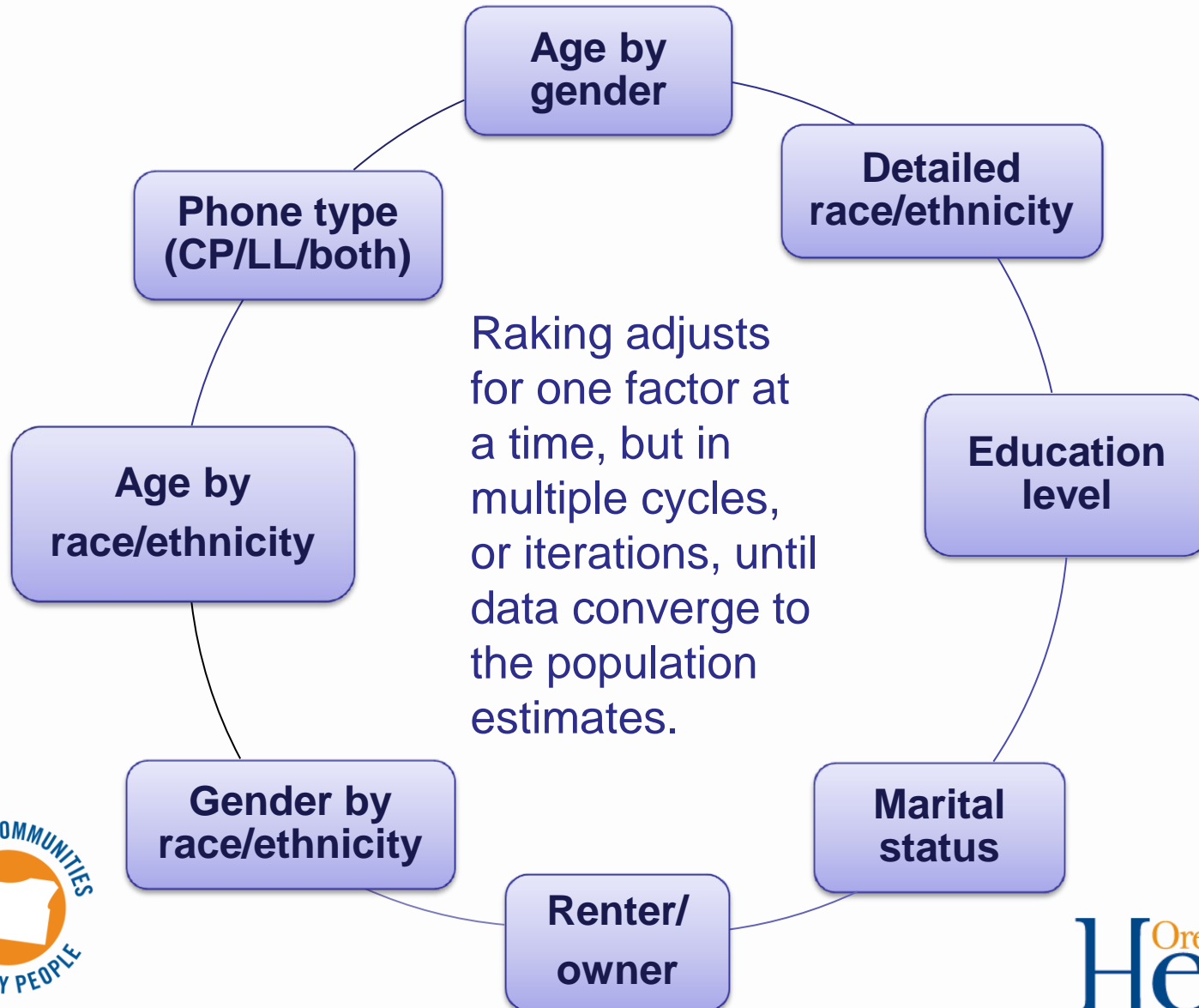
Raking Weight…

It's a whole new ball of wax

Now: "Raking" Weight

- Still comprised of two parts:
  - Chance of being selected
  - Demographic factors to make sample "look like" population: many more!
- Employs iterative proportional fitting, aka raking
  - Computationally intensive
- In effect from 2010 --??*

* For Oregon. For U.S. data, the classic weight was used through 2010.

Factors Included in Raking

Age by gender

Detailed race/ethnicity

Phone type (CP/LL/both)

Education level

Age by race/ethnicity

Raking adjusts for one factor at a time, but in multiple cycles, or iterations, until data converge to the population estimates.

Marital status

Gender by race/ethnicity

Renter/ owner

Why These Factors?

- CDC commissioned a study to identify demographics that were most likely to be related to key indicators
- Education, race, marital status, home ownership status
  - what do these have in common?
- Why wasn't income included?

Classic vs. Raking Weighting

Classic →

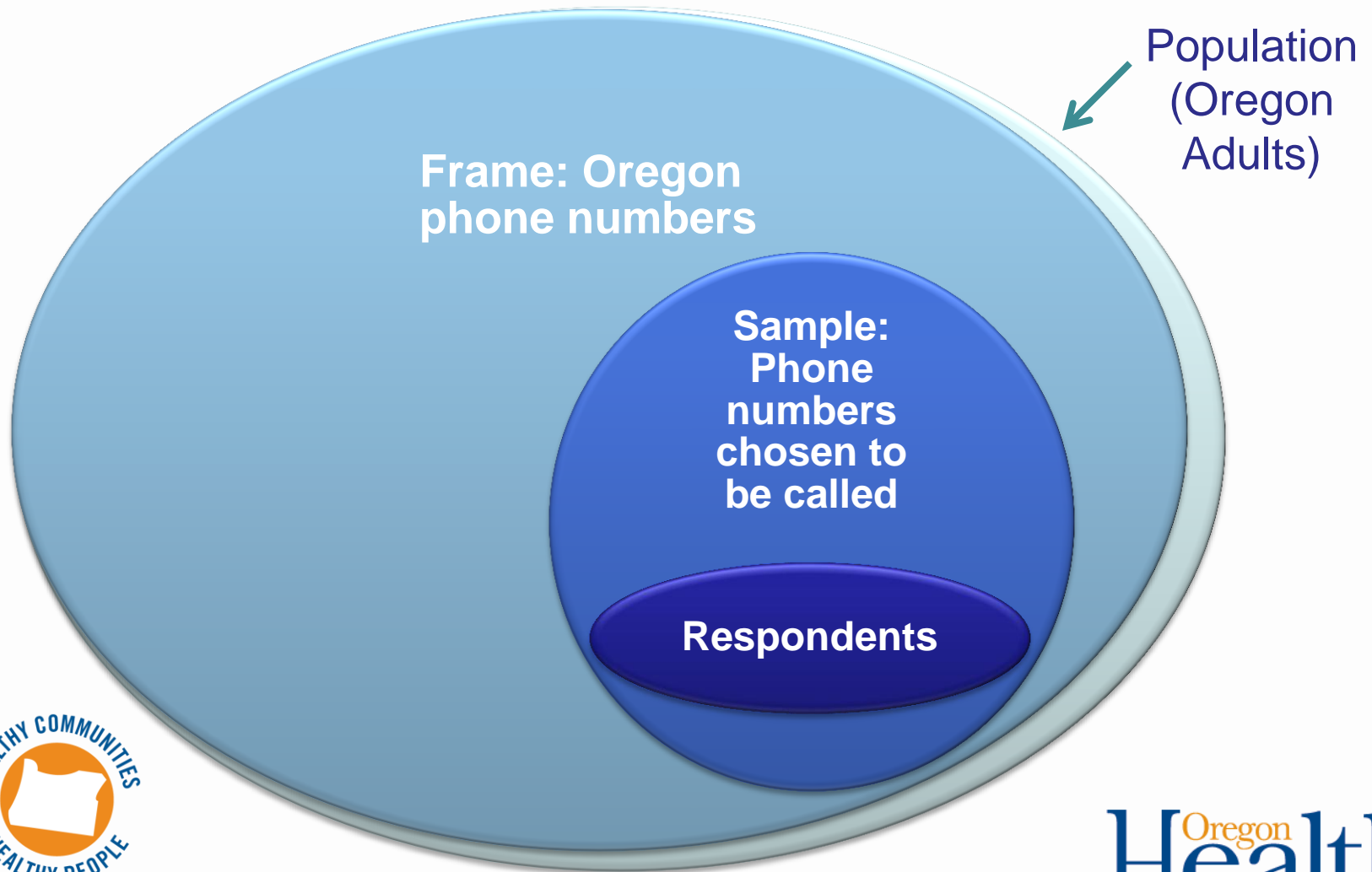← **Raking**

Adjusts for age and sex
Landline only

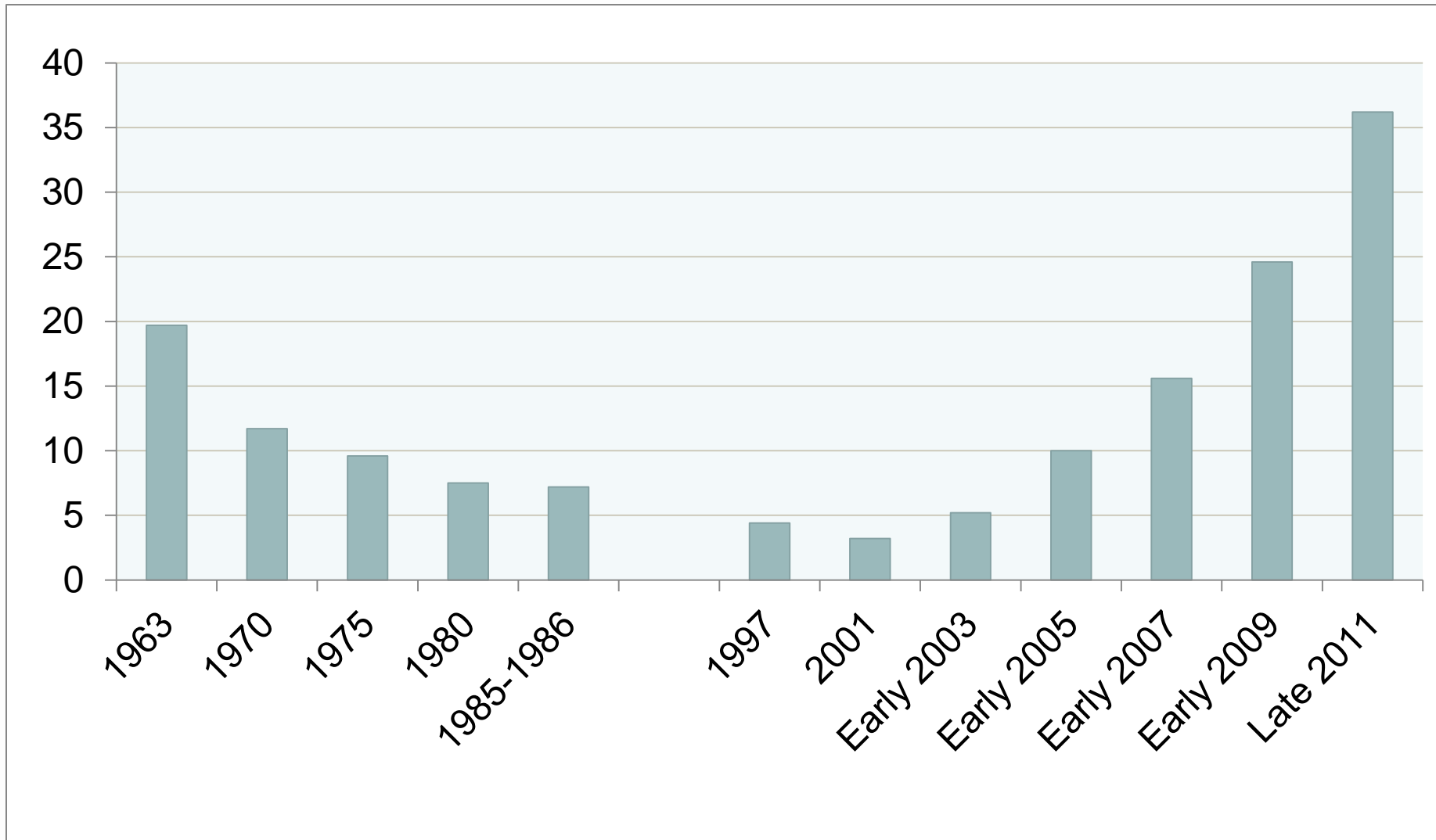Adjusts for age, sex, race/ethnicity, education level, marital status, home ownership, and includes cell phone data
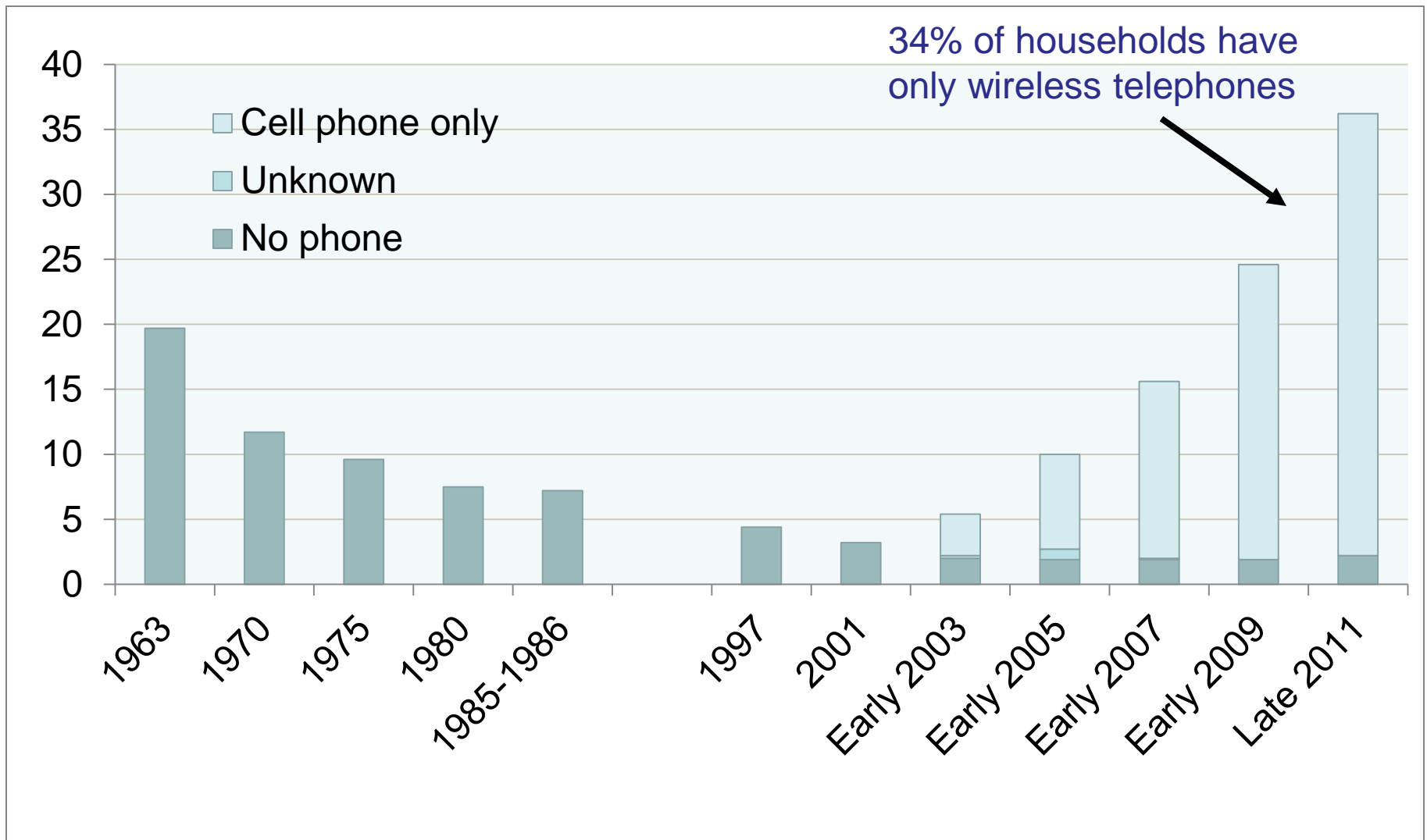
Why Does Cell Phone Matter?

Telephone Surveys (BRFSS, polls)

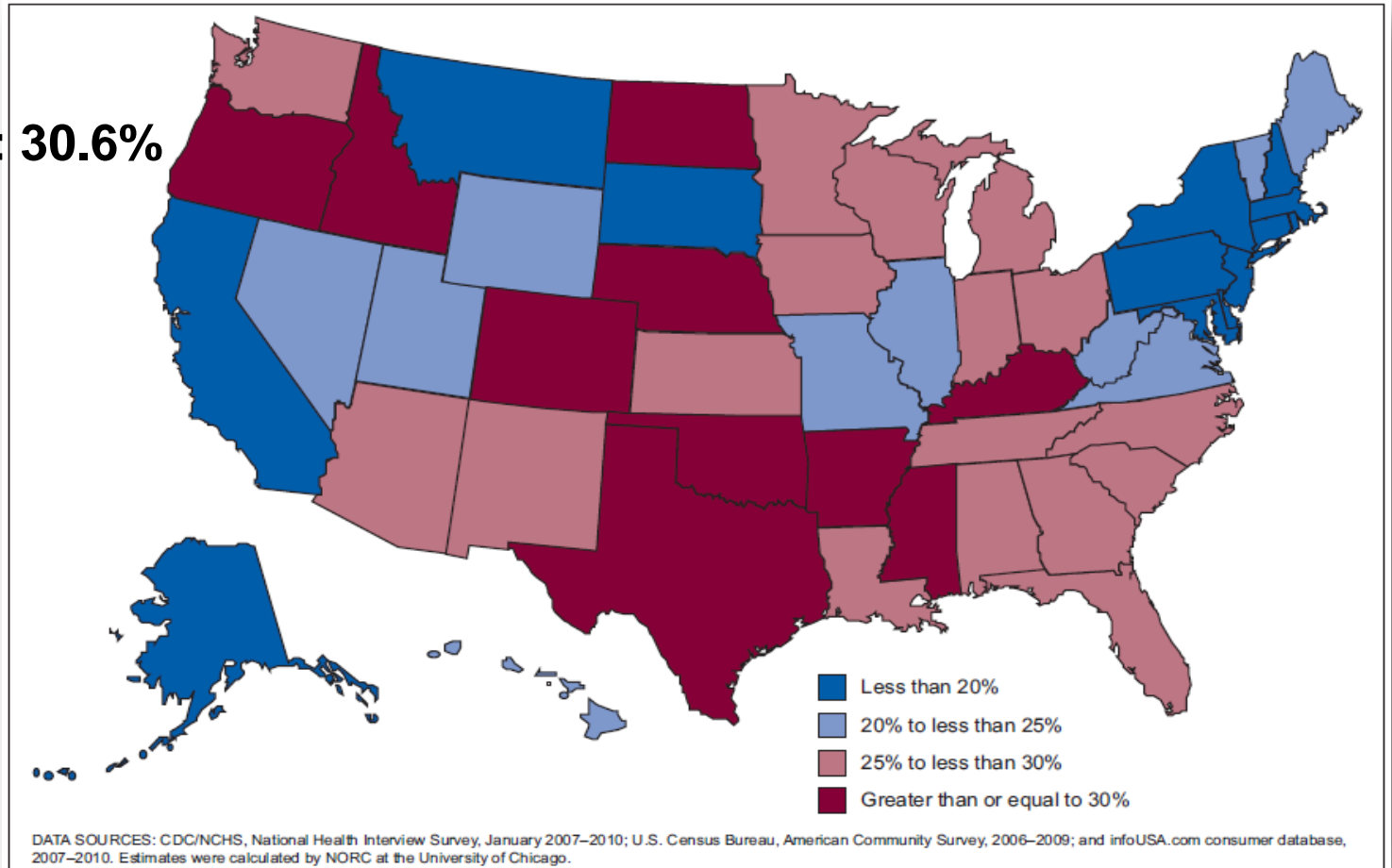# Percentage of U.S. Households Without Landline Telephones

Percentage of U.S. Households Without Landline Telephones

Cell Only by State: 2010 estimate

OR: 30.6%

Less than 20%
20% to less than 25%
25% to less than 30%
Greater than or equal to 30%

DATA SOURCES: CDC/NCHS, National Health Interview Survey, January 2007–2010; U.S. Census Bureau, American Community Survey, 2006–2009; and infoUSA.com consumer database, 2007–2010. Estimates were calculated by NORC at the University of Chicago.

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State-level Estimates From the National Health Interview Survey, January 2007–June 2010 Number 39 April 20, 2011
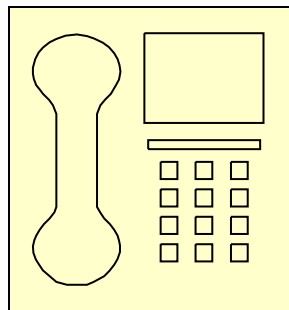
Pop Survey

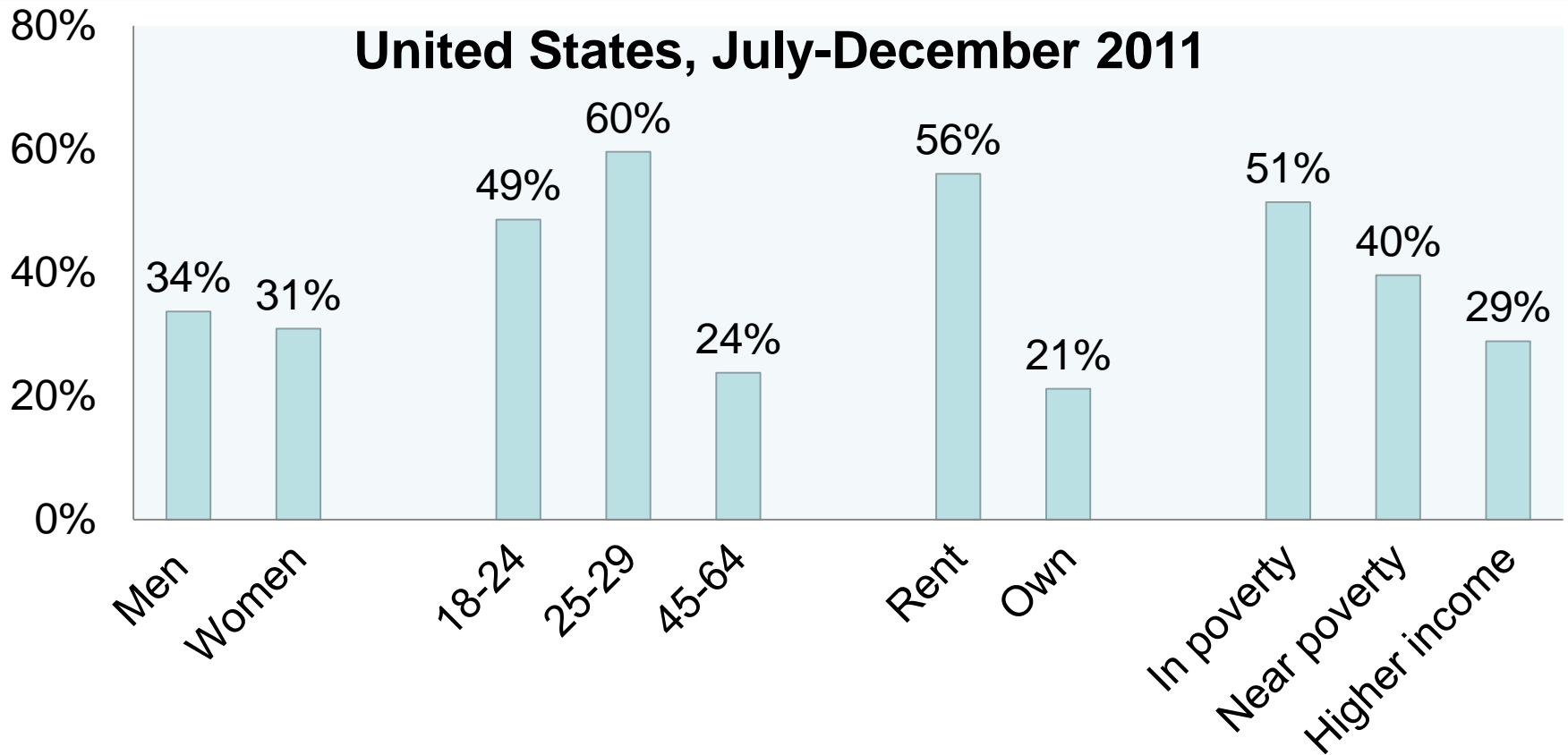- Who in this room has a cell phone?

- Who also has a landline?

Phone Types, Oregon Adults, July 2009-June 2010

- No phone: 2%
- Landline only: 12%
- Landline plus cell: 56%
- Cell only: 31%

Who has Switched to Cell Only?

United States, July-December 2011

- Men: 34%
- Women: 31%
- 18-24: 49%
- 25-29: 60%
- 45-64: 24%
- Rent: 56%
- Own: 21%
- In poverty: 51%
- Near poverty: 40%
- Higher income: 29%

What does this mean for Oregon?

- Let's look at some 2010 data weighted using the classic weight versus the raking weight

Percent of adults reporting selected health risks, Oregon, 2010

	Old method, landline only	New method, adds cell phone	Absolute difference
Binge drinking (past 30 days)	14.3	16.4	2.1
Consume 7+ sodas per week	12.3	14.3	2.0
Current cigarette smoking	16.4	19.9	3.5*
No leisure time physical activity	17.4	19.9	2.5
Obese	27.1	27.7	0.6

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* Difference is statistically significant

Percent of adults reporting selected chronic conditions, Oregon, 2010

Ever told by a health care provider that you have:	Old method, landline only	New method, adds cell phone	Absolute difference
Arthritis	30.2	32.0	1.8
Diabetes	7.1	8.4	1.3
High blood pressure	29.0	31.1	2.1
High cholesterol	37.0	38.1	1.1

* Difference is statistically significant

Percent of adults reporting selected screenings or other health-related factors, Oregon, 2010

	Old method, landline only	New method, adds cell phone	Absolute difference
Cholesterol check in past 5 years	74.6	73.0	(1.6)
Has health insurance, including Medicaid	83.4	79.8	(3.6)*
Health status (good to excellent)	84.2	81.8	(2.4)*
Screened for colorectal cancer appropriately (ages 50-75)	62.2	59.0	(3.2)

* Difference is statistically significant
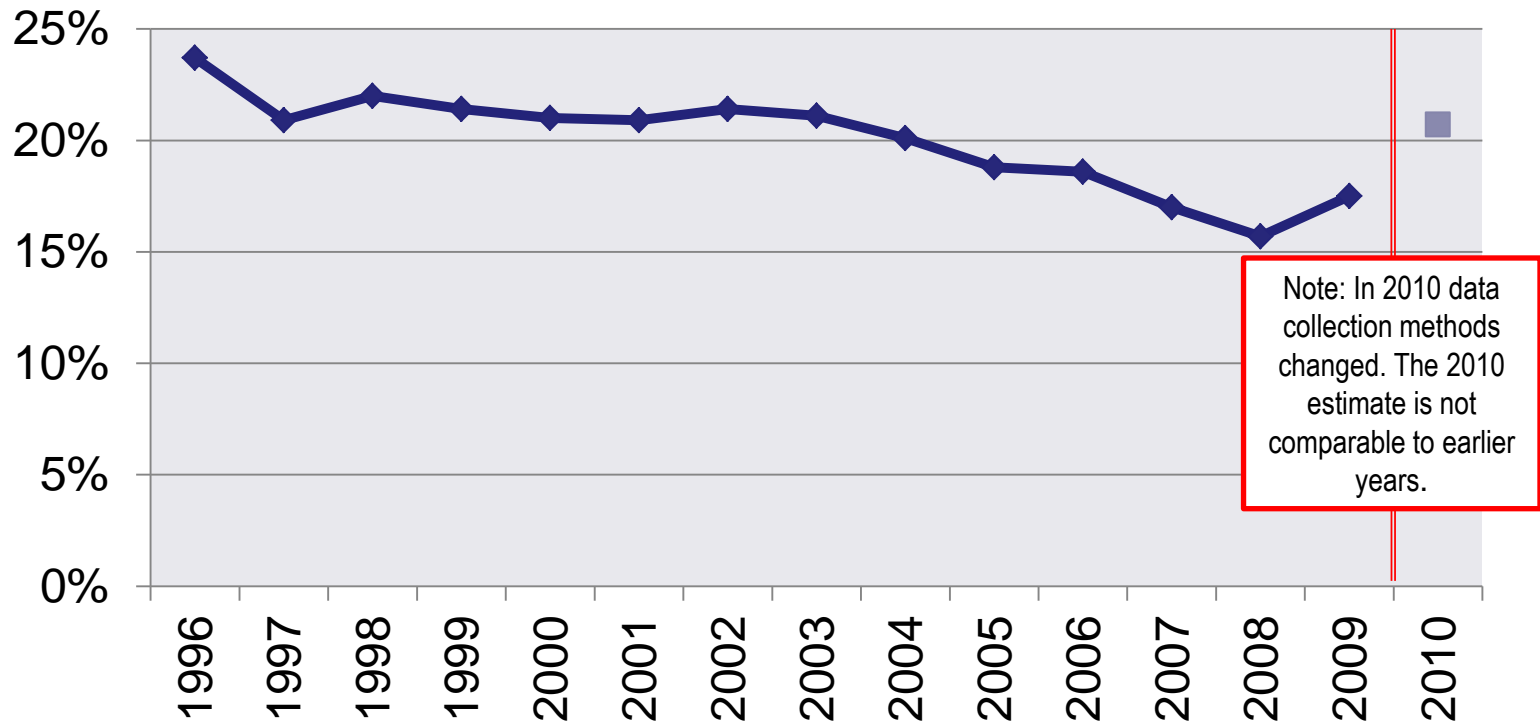
What does this mean for Oregon?

Or, Put Slightly Differently:

Q: Can estimates prepared from classic weighted data (prior to 2010) be compared with those using raking weighted data (2010 and later)?

A: People will want to compare the results, but they should not. It's like pressing the reset button.

Percentage of cigarettes smokers among Oregon adults, 1996-2010

Note: In 2010 data collection methods changed. The 2010 estimate is not comparable to earlier years.

And Another Thing…

Q. By instituting this change, won't some people conclude that BRFSS is unreliable?

A. Perhaps, but they'll adjust. This change keeps pace with a changing environment in which more adults use cell phones, and desktop computers are more powerful. Most survey researchers have or will make these shifts.

Oregon Health Authority Next Steps

- Document explaining the changes: "Adult Behaviors and Health Conditions from the BRFSS: 2010 Data Better Represent Oregon Adults"

- FAQ and Talking Points

- 2010 Oregon BRFSS data will be posted to the OHA website before the end of the year