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# ***BRFSS in Action:***

## **Integration of BRFSS & Epidemiology**

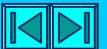
**"Going from Good to Great"**

**By LaTonya Bynum**

**Arkansas BRFSS Coordinator**

**[LaTonya.Bynum@arkansas.gov](mailto:LaTonya.Bynum@arkansas.gov)**

**501-661-2003**



# **CONTENTS:**

- I. Overview of BRFSS**
- II. BRFSS Survey Design**
- III. Analyzing BRFSS Data**
- IV. Cross Checking Analysis**
- V. Resources**
- VI. Next Steps & BRFSS Challenges**



# ***I. OVERVIEW OF BRFSS***

# Behavioral Risk Factor Surveillance System

*BRFSS* is a random digit dial telephone survey that collects health information from adults on behaviors that put health at risk for premature death and disease.

*Six benefits of the survey:*



- 1) Covers most health topics
- 2) Identifies health disparities
- 3) Public data use file
- 4) Results can be viewed online
- 5) Data collected annually
- 6) *FREE* Technical assistance



# State BRFSS Facts & Update

- Data collected continuously since 1993
- Sample size range: 1,764 – 5,732
- Sends out monthly advance letters
- Moving towards multimodal survey & new weighting procedure
- Cell phone pilot study began in 2009
- Oversampling for Blacks and Hispanics

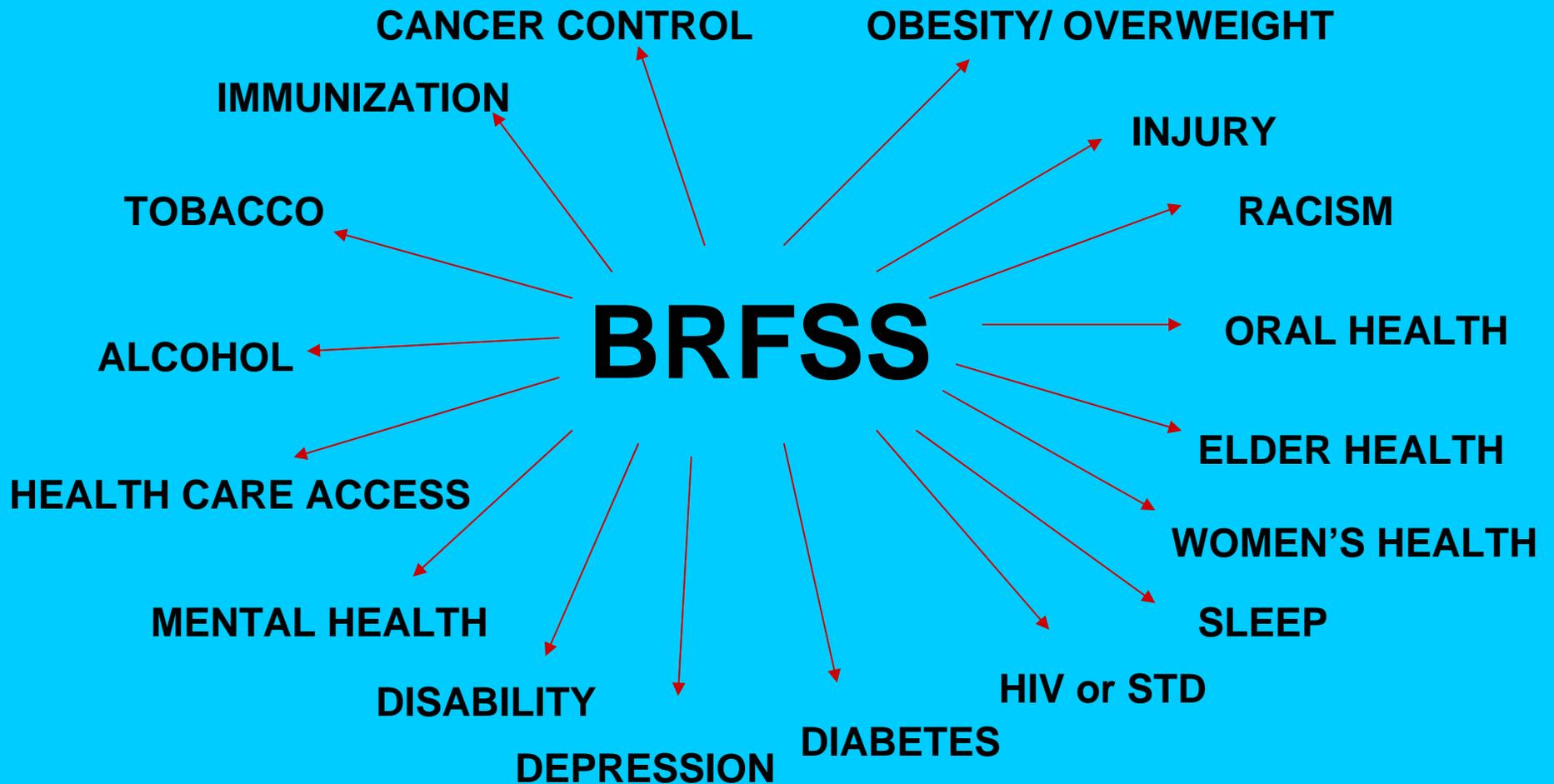
# Who Uses BRFSS Data?

- State and Local Health Departments
- Community health program planners
- Healthcare Professionals
- Federal Agencies
- Students & Researchers
- Media
- Epidemiologists

# BRFSS Data Are Used To

- Assess health needs of the population
- Identify health disparities
- Prepare grant proposals
- Publish articles in professional journals
- Inform Policymakers
- Monitor Healthy People 2010 Progress

# BRFSS Topics of Interest...



**+ 50 OTHER TOPICS**

## ***II. BRFSS SURVEY DESIGN***

# Questionnaire

Consist of:

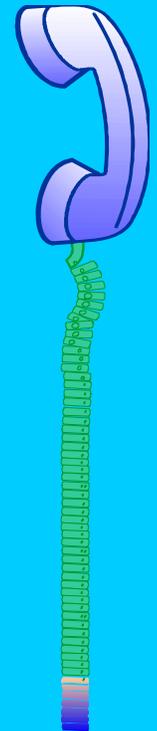
- 1) Fixed Core\*  
Rotating Core I & II\*  
Emerging Core\*
- 2) State sponsored optional modules
- 3) State-added questions

\*Required by CDC

Introduction and Random Adult Selection Module.....	1
Core Section 01: Health Status.....	5
Core Section 02: Healthy Days-Health-Related Quality of Life.....	5
Core Section 03: Health Care Access.....	6
Core Section 04: Sleep.....	7
Core Section 05: Exercise.....	7
Core Section 06: Diabetes.....	8
Core Section 07: Hypertension Awareness.....	8
Core Section 08: Cholesterol Awareness.....	9
Core Section 09: Cardiovascular Disease Prevalence.....	10
Core Section 10: Asthma.....	10
Core Section 11: Tobacco Use.....	11
Core Section 12: Demographics.....	12
Cell Phone Questions (January through December).....	18
Core Section 13: Caregiver Status.....	19
Core Section 14: Disability.....	20
Core Section 15: Alcohol Consumption.....	20
Core Section 16: Immunization.....	22
Required Module: Pandemic Flu (January - February).....	23
Core Section 17: Arthritis Burden.....	28
Core Section 18: Fruit and Vegetables.....	30
Core Section 19: Physical Activity.....	32
Core Section 20: HIV/AIDS.....	34
Core Section 21: Emotional Support and Life Satisfaction.....	36
Core Section 22: Cancer Survivors.....	37
Module 06: Cardiovascular Health.....	40
Module 07: Actions to Control High Blood Pressure.....	41
Module 24: Adverse Childhood Experience (ACE).....	44
State Added 01: Women's Health.....	47
State Added 02: Disability.....	49
State Added 03: Intimate Partner Violence.....	50
State Added 04: Traumatic Brain Injury.....	53
State Added 05: Interview Length.....	54

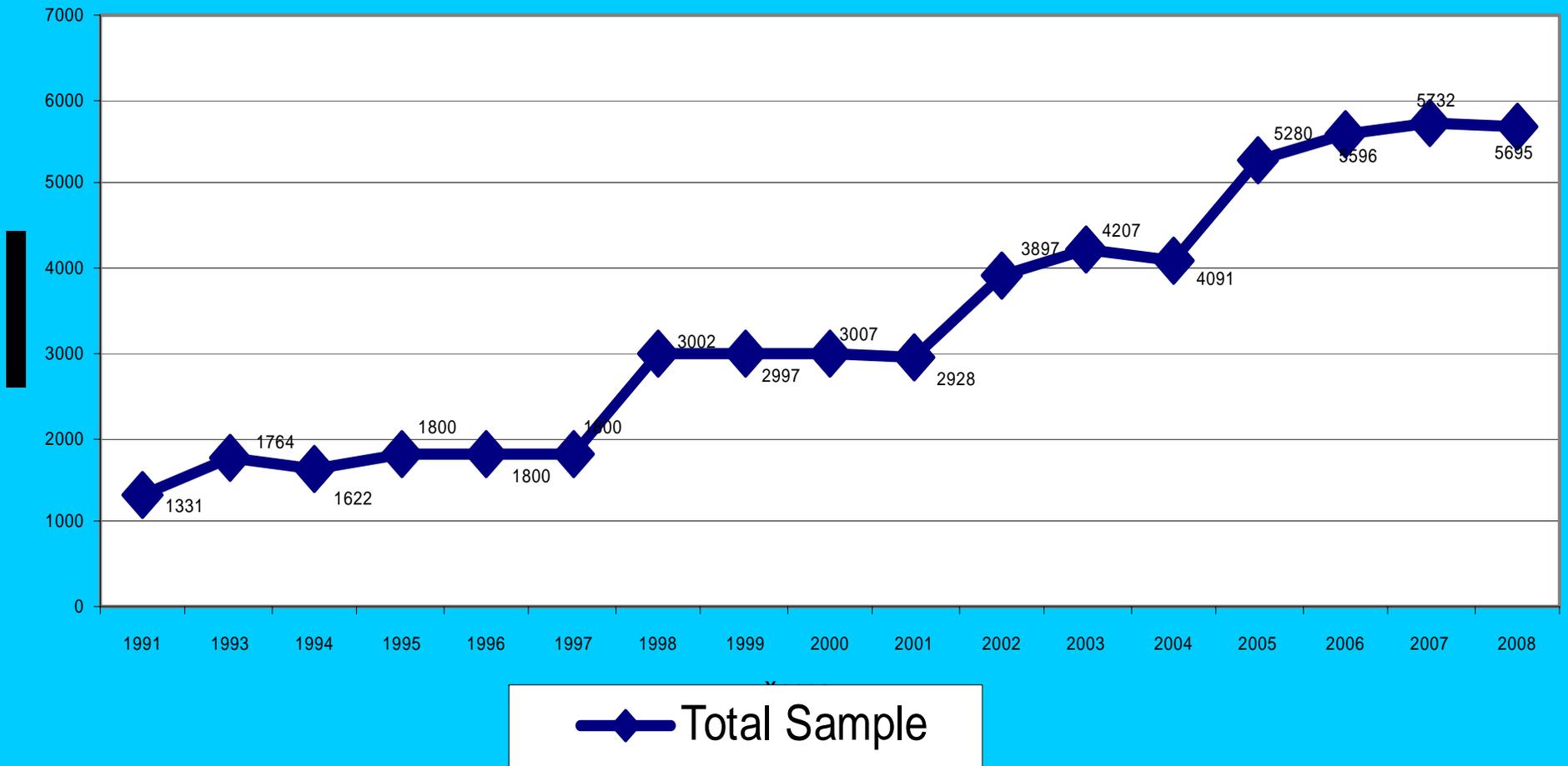
# BRFSS Methodology

- 1) Select household w/ telephone
- 2) Randomly select one adult 18+
- 3) Using Computer-Aided Telephone Interviewing System



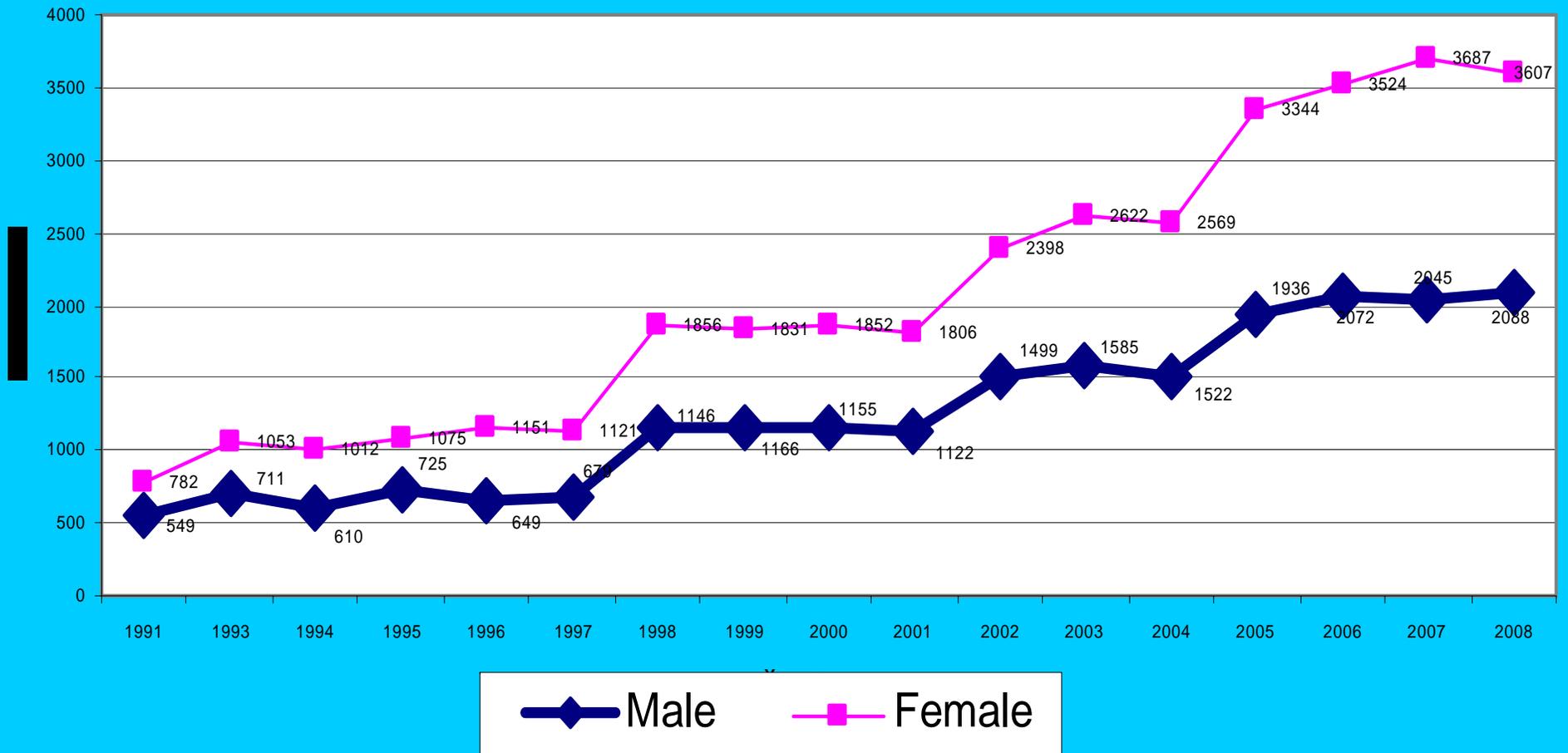
# Study Population

Total Sample Size for Arkansas by Interview Year



# Study Population: Gender

Total Sample Size for Arkansas by Interview Year



# Study Populations

- Veterans
- Young Adults vs. Older Adults
- Binge Drinkers
- People with Diabetes
- Pregnant Women Ages 18 - 44
- Congressional District
- Public Health Region
- Sex & Race/Ethnicity
- Men or Women Age 40+
- Current Smokers
- Adults below or above Federal Poverty Level
- People with Arthritis
- People with a Disability
- Uninsured
- Household Size
- Urban vs. Rural
- County of Residence
- Zip Code
- Unemployed vs. Employed
- People with Asthma
- Tested for HIV
- Self Reported Heart Attack
- Physically Inactive
- Married vs. Unmarried
- Fair or Poor Health
- People with Traumatic Brain Injury
- People with less than high school education
- & more

## ***II. ANALYZING BRFSS DATA***

## Scenario:

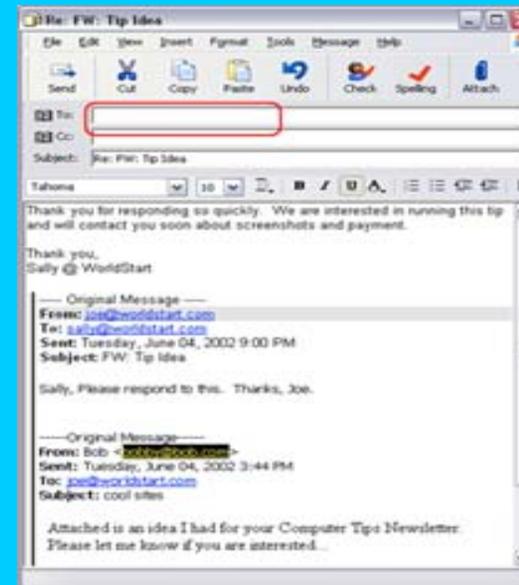
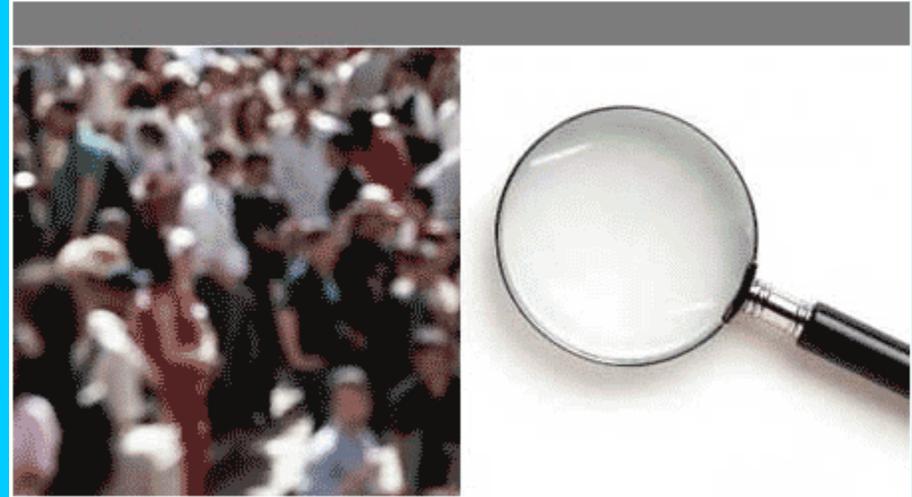
You've just arrived into the office and you have several messages requesting Arkansas BRFSS data.

Your probably going to do one of two things:

1. Open SAS and write a program to query the data set for the information you need.

*or*

2. Forward the data request on to LaTonya Bynum @ [latonya.bynum@arkansas.gov](mailto:latonya.bynum@arkansas.gov)



# Public Health Question

- An epidemiologist is asked to provide the most current information on Arkansas uninsured adults by age categories 18 -24, 25-34, 35-44, 45-54, 55-64, 65+.
- Which one of the six age groups have the highest uninsured rate?



# Three Step Process

1. Review Questionnaire & Codebook
2. Open SAS & Type in Code
3. Run query on the data set

**Easy as 1 – 2 – 3!**



# Step 1: Review Questionnaire & Codebook

Two questions will be used:

- Do you have any kind of health care coverage? (HLTHPLAN)
- What is your age? (AGE)

## Step 2: Type In SAS Code

```
libname sasdata 'C:\BRFSSdata';
```

```
data temporary;  
set sasdata.brfss08_wgt;
```

```
if (18 le age le 24) then _agegroup=1;      **** young adults;  
else if (25 le age le 34) then _agegroup=2; **** middle adults;  
else if (35 le age le 44) then _agegroup=3; **** middle adults;  
else if (45 le age le 54) then _agegroup=4; **** middle adults;  
else if (55 le age le 64) then _agegroup=5; **** middle adults;  
else if (age ge 65) then _agegroup=6;      **** older adults;  
else if age in (7,9,.) then _agegroup=.;    **** missing;
```

```
if hlthplan =1 then hlthplan=1;  
else if hlthplan=2 then hlthplan=2;  
else if hlthplan in (7,9,.) then hlthplan=.;
```

```
proc freq data=temporary;  
table _agegroup * hlthplan;  
weight _finalwt;  
run;
```

# Step 3: Query the BRFSS Data

SAS - [Epi program.sas]

File Edit View Tools Run Solutions Window Help

libname sasdata 'C:\BRFSSdata';

```
data temporary;
set sasdata.brfss08_wgt;

if (18 le age le 24) then _agegroup=1;      **** young adults;
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else if (55 le age le 64) then _agegroup=5; **** middle adults;
else if (age ge 65) then _agegroup=6;      **** older adults;
else if age in (7,9,.) then _agegroup=.;    **** missing;

if h1thplan =1 then h1thplan=1;
else if h1thplan=2 then h1thplan=2;
else if h1thplan in (7,9,.) then h1thplan=.;

proc freq data=temporary;
table _agegroup * h1thplan;
weight _finalwt;
run;
```

Results

- Results
- Freq: The SAS Sy
- Freq: The SAS Sy

Output - (Untitled) Log - (Untitled) Epi program.sas

NOTE: 21 Lines Submitted. C:\brfss\Data Requests\2009\ Ln 22, Col 1

# Review SAS Log & Output

The screenshot shows the SAS software interface. The main window displays a frequency table with columns for 'Frequency', 'Percent', 'Row Pct', 'Col Pct', and 'Total'. The table has six rows, numbered 1 through 6. A yellow text box is overlaid on the table, asking: 'Which of the six age groups have the highest uninsured rate?'. The bottom of the window shows the taskbar with several open windows: 'Results', 'Explorer', 'Output - (Untitled)', 'Log - (Untitled)', and 'Epi program.sas'. The system tray at the bottom right shows the path 'C:\brfss\Data Requests\2009\'. The SAS window title is 'SAS - [Output - (Untitled)]' and the menu bar includes 'File', 'Edit', 'View', 'Tools', 'Solutions', 'Window', and 'Help'.

Frequency	Percent	Row Pct	Col Pct	Total
1	165581	112455	278036	13.16
	7.84	5.32		
	59.55	40.45		
	9.61	28.84		
2	279725	88707.1	368432	17.44
	13.24	4.20		
	75.92	24.08		
	16.23	22.75		
3	308978	70836.1	379814	17.97
	14.62	3.35		
	81.35	18.65		
	17.93	18.17		
4	304506	67248.8	371755	17.59
	14.41	3.18		
	81.91	18.09		
	17.67	17.25		
5	274196	42691.1	316887	15.00
	12.98	2.02		
	86.53	13.47		
	15.91	10.95		
6	390243	7950.55	398193	18.84
	18.47	0.38		
	98.00	2.00		
	22.65	2.04		

Which of the six age groups have the highest uninsured rate?

# Review SAS Log & Output

The screenshot shows the SAS interface with a frequency table. A yellow box contains the question: "Which of the six age groups have the highest uninsured rate?". The table has columns for Row, Col, Total, and Percent. The cell for Row 1, Col 2 is highlighted with a red box.

Row	Col	Total	Percent
1	1	165581	7.84
1	2	112455	5.32
1	Total	278036	13.16
2	1	279725	13.24
2	2	88707.1	4.20
2	Total	368432	17.44
3	1	308978	14.62
3	2	70836.1	3.35
3	Total	379814	17.97
4	1	304506	14.41
4	2	67248.8	3.18
4	Total	371755	17.59
5	1	274196	12.98
5	2	42691.1	2.02
5	Total	316887	15.00
6	1	390243	18.47
6	2	7950.55	0.38
6	Total	398193	18.84

Which of the six age groups have the highest uninsured rate?

# Public Health Question

- An epidemiologist is asked to provide the most current information on Arkansas uninsured adults by age categories 18 -24, 25-34, 35-44, 45-54, 55-64, 65+.
- Which one of the six age groups have the highest uninsured rate?

**ANSWER:**

**18 - 24 AGE GROUP (40.45%)**



# ***IV. CROSS CHECKING ANALYSIS***

http://apps.nccd.cdc.gov/brfss/index.asp



Bookmark it!

National Center for Chronic Disease Prevention and Health Promotion  
**Behavioral Risk Factor Surveillance System**  
[BRFSS Home](#) | [Contact Us](#)

► BRFSS CONTENTS

- [Prevalence and Trends Data](#)
- [SMART: City and County Data](#)
- [BRFSS Maps](#)
- [Web Enabled Analysis Tool \(WEAT\)](#)
- [Chronic Disease Indicators \(CDI\)](#)
- [About the BRFSS](#)
- [BRFSS Datasets \(downloads and documentaion\)](#)
- [Chronic Disease and the Environment](#)
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- [FAQs](#)
- [State Information](#)
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## Prevalence and Trends Data

**NOTE:** When comparing prevalence of variables across states or years, we recommend the use of confidence intervals. If the confidence intervals overlap, the difference is not statistically significant.

Please choose from the following pull-down menus to search for BRFSS data.

**State:**

**Year:**

**Category:**

This is the main page: You can pull-down the menus to search for information by state, year and category.

[States conducting surveillance, by year](#)

For more information on risk factors and calculated variables, see the [Technical Documents and Survey Data](#) for a specific year.

**Recommended citation:** Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S.

# Cross Check Calculations

BRFSS Prevalence and Trends Data - Start Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help



## BRFSS CONTENTS

- Prevalence and Trends Data
- SMART: City and County Data
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- Related Links

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National Center for Chronic Disease Prevention and Health Promotion

## Behavioral Risk Factor Surveillance System

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### Prevalence and Trends Data

**NOTE:** When comparing data for two consecutive years, we recommend the use of the same survey years. If survey intervals overlap, the difference is not statistically significant.

Please choose from the following pull-down menus to search for BRFSS data.

**State:**

**Year:**

**Category:**

Select the state of interest, "Arkansas."

Select the year, "2008."

Select the category, "Health Care Access/Coverage." and Press the "Go" Option.

[States conducting surveillance, by year](#)

For more information on risk factors and calculated variables, see [Documents and Survey Data](#) for a specific year.

**Recommended citation:** Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [appropriate year].

# Cross Check Calculations

BRFSS Prevalence and Trends Data - Question/Category List - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://apps.nccd.cdc.gov/brfss/page.asp?cat=HC&yr=2008&state=AR#HC> Go Links

## Health Care Access/Coverage

Choose a question to view its data.

- [Do you have any kind of health care coverage?](#)
- [Adults aged 18-64 who have any kind of health care coverage](#)

▲ [Top of Page](#)

## Health Status

? [Hypertension Awareness](#)

## Immunization

## Oral Health

## Overweight and Obesity (BMI)

? [Physical Activity](#)

## Prostate Cancer

## Tobacco Use

## Women's Health

Select the option for "Health Care Coverage Analysis" by clicking here.

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# Cross Check Calculations

BRFSS Prevalence and Trends Data - Data Display - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://apps.nccd.cdc.gov/brfss/display.asp?cat=HC&yr=2008&qkey=868&state=AR>



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- [Select Another Question](#)
- [Compare to Another State or Year](#)
- [List All States](#)

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National Center for Chronic Disease Prevention & Health Promotion

## Behavioral Risk Factor Surveillance System

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### Prevalence and Trends Data

Arkansas - 2008

Click the drop down menu and select the option for "Grouped by Age" and click "Go" button.

Group By:

- No Grouping
- Grouped by Gender
- Grouped by Age
- Grouped by Race
- Grouped by Income
- Grouped by Education

Do you have any kind of health care coverage?

	Yes	No
%	81.7	18.3
CI	(80.1-83.4)	(16.6-19.9)
n	4917	762

% = Percentage, CI = Confidence Interval, n = Cell Size  
Percentages are weighted to population characteristics.

# Cross Check Calculations

BRFSS Prevalence Data - Age Grouping - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://apps.nccd.cdc.gov/brfss/age.asp?cat=HC&yr=2008&qkey=8688&state=AR> Go Links

## Access/Coverage

Do you have any kind of health care coverage?

Export Printer Friendly

Age:		Yes	No
18-24	% CI n	59.6 (50.7-68.4) 96	40.4 (31.6-49.3) 72
25-34	% CI n	75.9 (71.5-80.3) 386	24.1 (19.7-28.5) 129
35-44	% CI n	81.3 (78.1-84.6) 598	18.7 (15.4-21.9) 154
45-54	% CI n	81.9 (79.0-84.8) 861	18.1 (15.2-21.0) 195
55-64	% CI n	87.0 (84.8-89.1) 1117	13.0 (10.9-15.2) 177
65+	% CI n	98.0 (97.2-98.8) 1859	2.0 (1.2-2.8) 35

This shows the Age Category is "18-24", % (Percent), CI (Confidence Intervals), and n (number of people who were interviewed).

This shows the percent of 18 – 24 year old adults who reported they are were uninsured "40.4%".

# Additional Cross Checkers

**CDC Morbidity & Mortality Weekly Reports**

<http://www.cdc.gov/mmwr/>

**Arkansas BRFSS Presentations**

[http://www.brfss.arkansas.gov/presentations\\_brfss.html](http://www.brfss.arkansas.gov/presentations_brfss.html)

**Arkansas BRFSS Publications**

<http://www.brfss.arkansas.gov/publications.html>

**Arkansas BRFSS Health Link**

[http://www.brfss.arkansas.gov/health\\_link.html](http://www.brfss.arkansas.gov/health_link.html)

**Arkansas Optional Module Data**

[http://www.brfss.arkansas.gov/survey\\_data.html](http://www.brfss.arkansas.gov/survey_data.html)

**Arkansas BRFSS GIS Maps**

<http://www.brfss.arkansas.gov/maps.html>

**CDC Web Enabled Analysis Tool (Logistic Regression & Cross Tabs)**

[http://apps.nccd.cdc.gov/s\\_broker/htmsql.exe/weat/index.hspl](http://apps.nccd.cdc.gov/s_broker/htmsql.exe/weat/index.hspl)



# ***IV. RESOURCES***

# Things to Remember

- **Sample:** Use caution when interpreting estimates where the sample size is less than 50 or the confidence interval is more than 10. Those estimates are unreliable.
- **Combine data:** It is possible to group more than one year of data to get a larger sample size.
- **Weight:** Percentages are weighted to the population characteristics of Arkansas only when you use this

# Website Resources

To learn how to analyze the Arkansas BRFSS data in greater detail, the following websites provide excellent resources:

**Arkansas BRFSS Questionnaires**

<http://www.brfss.arkansas.gov/questionnaires.html#state>

**BRFSS Survey Data, Codebook & Documentation**

[http://www.cdc.gov/brfss/technical\\_infodata/surveydata.htm](http://www.cdc.gov/brfss/technical_infodata/surveydata.htm)

**CDC BRFSS Prevalence and Trends Data Website**

<http://apps.nccd.cdc.gov/brfss/index.asp>



# Arkansas BRFSS Resource Team

- Dr. John Senner, Branch Chief
- Dr. Mary McGehee, Survey Section Chief
- LaTonya Bynum, State BRFSS Coordinator
- Abby Holt & Letitia DeGraft-Johnson, County Adult & Youth Health Survey Coordinators

Contact Information: 501-661-2368

***IV. NEXT STEPS/BRFSS  
CHALLENGES***

# Challenges

- **Staff:** Use Greta Kilmer, CDC Arkansas BRFSS Epidemiologist, as an additional ADH resource (i.e., factsheets, journal articles, and reports).
- **Products:** Create and think of ways to use the BRFSS data to promote public health.
- **Data Requests:** Become a data user and not just a data requestor.
- **Promote BRFSS:** Educate others on process for using Arkansas BRFSS data as a resource tool.
- **State Added Questions:** Think outside the box when selecting state added questions.