SUDAAN & Age-Adjusting

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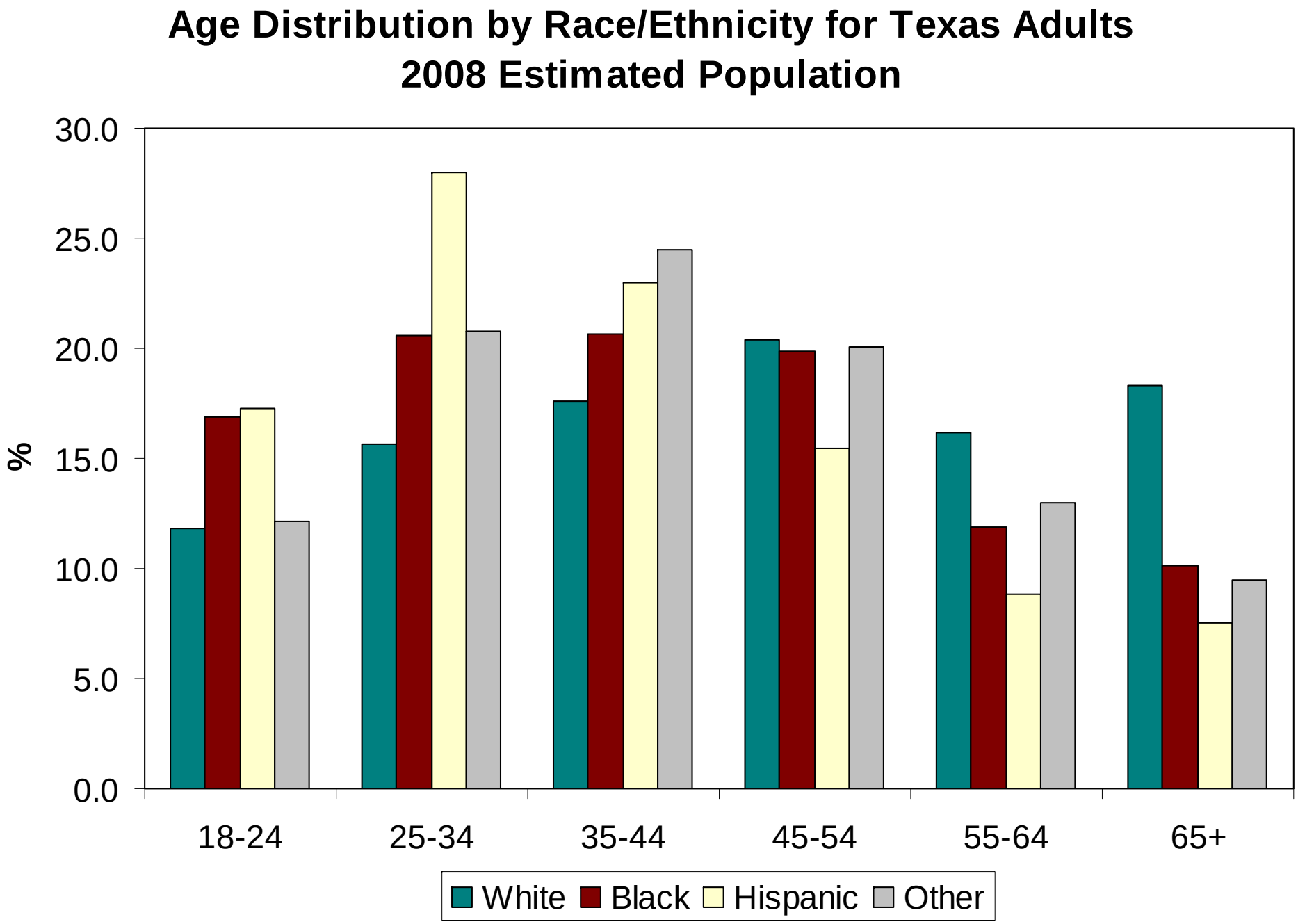
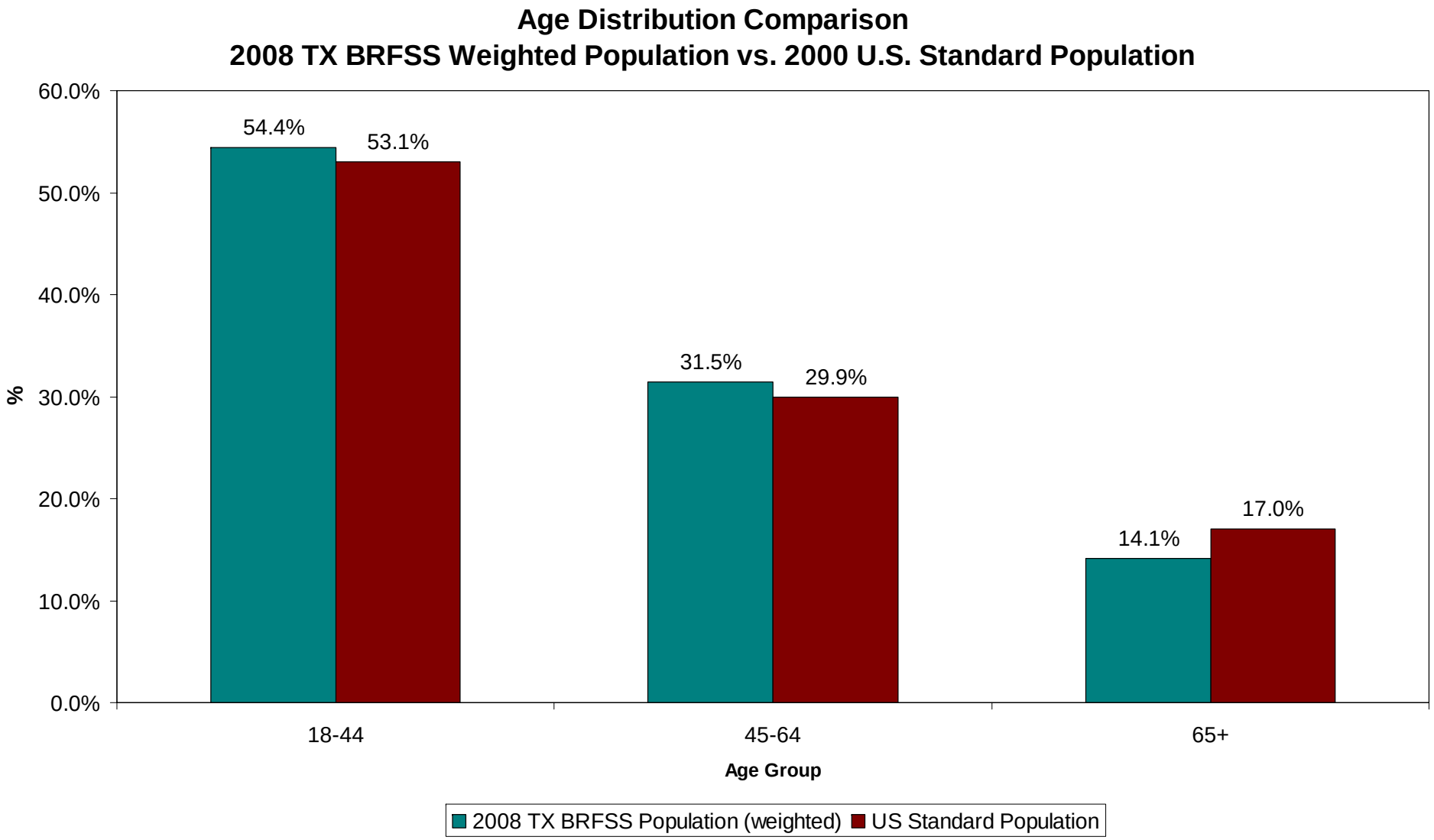
Outline

- Why Age-Adjust?
- Hand Example
- SUDAAN

Why Age-Adjust?

- Eliminate differences in rates in populations of interest that result from differences in the populations' age distributions.
  - 2+ populations at one time
    - Demographic groups
    - Geographic groups
  - 1 population at more than one time
- U.S. Standard Population
- Healthy People 2010 Objectives
  - Different age groups for many objectives.
  - Need to see what they used.


Age Distribution by Race/Ethnicity for Texas Adults
2008 Estimated Population
30.0
25.0
20.0
15.0
10.0
5.0
0.0
%
18-24
25-34
35-44
45-54
55-64
65+
White
Black
Hispanic
Other


Age Distribution Comparison
2008 TX BRFSS Weighted Population vs. 2000 U.S. Standard Population
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
%
54.4%
53.1%
31.5%
29.9%
14.1%
17.0%
18-44
45-64
65+
Age Group
2008 TX BRFSS Population (weighted)
US Standard Population

Hand Example

Diabetes

Age-Adjusted Diabetes Prevalence

	% TX Diabetes (weighted)	2000 Standard Population	Number of Diabetics Adjusted	% Diabetes (age adjusted)
18+ years	9.7%			
18-44 years	3.4%			
45-64 years	14.6%			
65+ years	22.7%			

Age-Adjusted Diabetes Prevalence

	% TX Diabetes (weighted)	2000 Standard Population	Number of Diabetics Adjusted	% Diabetes (age adjusted)
18+ years	9.7%	203,851,000		
18-44 years	3.4%	108,150,000		
45-64 years	14.6%	60,991,000		
65+ years	22.7%	34,710,000		

Age-Adjusted Diabetes Prevalence

	% TX Diabetes (weighted)	2000 Standard Population	Number of Diabetics Adjusted	% Diabetes (age adjusted)
18+ years	9.7%	203,851,000		
18-44 years	3.4%	108,150,000	3,677,100	
45-64 years	14.6%	60,991,000	8,904,686	
65+ years	22.7%	34,710,000	7,879,170	

Age-Adjusted Diabetes Prevalence

	% TX Diabetes (weighted)	2000 Standard Population	Number of Diabetics Adjusted	% Diabetes (age adjusted)
18+ years	9.7%	203,851,000	20,460,956	
18-44 years	3.4%	108,150,000	3,677,100	
45-64 years	14.6%	60,991,000	8,904,686	
65+ years	22.7%	34,710,000	7,879,170	

Age-Adjusted Diabetes Prevalence

	% TX Diabetes (weighted)	2000 Standard Population	Number of Diabetics Adjusted	% Diabetes (age adjusted)
18+ years	9.7%	203,851,000	20,460,956	10.0%
18-44 years	3.4%	108,150,000	3,677,100	
45-64 years	14.6%	60,991,000	8,904,686	
65+ years	22.7%	34,710,000	7,879,170	

Now, let’s run this in SUDAAN!

```
proc descript data =
    "h:\brfss_data\brfss08\state\state_08_working_mc.sav" design = wr
    filetype= spss;
nest ststr seqno;
weight cdcfinwt;
setenv linesize = 106 pagesize = 45 colwidth = 11 topmgn = 1;
subgroup agegr_diab diabetes raceeth;
levels 3 2 3;
var diabetes;
catlevel 1;
stdvar agegr_diab;
stdwgt 0.530535 0.299194 0.170271;
tables agegr_diab;
print wsum nsum percent lowpct uppct/  style = nchs nodate notime
    nohead
percentfmt=f8.4 lowpctfmt=f8.4 uppctfmt=f8.4;
```

Results

Variance Estimation Method: Taylor Series (WR)
Standardized estimates
by: Variable, 3 age groups for diabetes age adjusting.

Variable	3 age groups for diabetes age adjusting	Weighted Size	Sample Size	Percent	Lower 95% Limit Percent	Upper 95% Limit Percent
Doctor Diagnosed Diabetes: Yes						
	Total	**17278954.60**	**10583**	**10.0492**	**9.3097**	**10.8405**
	18-44	9400637.27	3131	3.4250	2.6263	4.4554
	45-64	5438375.31	4100	14.6138	13.1054	16.2634
	65+	2439942.03	3352	22.6683	20.6180	24.8587

DESCRIPT used
CPU time : 8.0 seconds
Elapsed time : 8 seconds
Virtual memory : 2.03 MB

By Race/Ethnicity

```
proc descript data =
    "h:\brfss_data\brfss08\state\state_08_working_mc.sav" design = wr
    filetype= spss;
nest ststr seqno;
weight cdcfinwt;
setenv linesize = 106 pagesize = 45 colwidth = 11 topmgn = 1;
subgroup agegr_diab diabetes raceeth c03q01;
levels 3 2 3 2;
var diabetes;
catlevel 1;
stdvar agegr_diab;
stdwgt 0.530535 0.299194 0.170271;
tables raceeth;
print wsum nsum percent lowpct uppct/  style = nchs nodate notime
    nohead
percentfmt=f8.4 lowpctfmt=f8.4 uppctfmt=f8.4;
```

A Comparison by Race/Ethnicity

Variance Estimation Method: Taylor Series (WR)
Standardized estimates
by: Variable, Race/Ethnicity.

Variable Race/Ethnicity	Weighted Size	Sample Size	Percent	Lower 95% Limit Percent	Upper 95% Limit Percent
Doctor Diagnosed					
Diabetes: Yes					
Total	16320966.81	10195	10.0867	9.3272	10.9005
White	8762005.70	6922	7.5425	6.6502	8.5435
Black	1687118.55	747	14.4612	11.9167	17.4414
Hispanic	5871842.56	2526	14.4678	12.7871	16.3281

DESCRIPT used
CPU time : 8.0 seconds
Elapsed time : 8 seconds
Virtual memory : 2.03 MB

Obtaining Prevalence Rates in SUDAAN

```
proc crosstab data =
    "h:\brfss_data\brfss08\state\state_08_working_mc.sav" design =
    wr filetype= spss;
nest ststr seqno;
weight cdcfinwt;
setenv linesize = 106 pagesize = 45 colwidth = 11 topmgn = 1;
subgroup diabetes;
levels 2;
tables diabetes;
print wsum nsum rowper lowrow uprow/  style = nchs nodate
    notime nohead
rowperfmt=f8.4 lowrowfmt=f8.4 uprowfmt=f8.4;
TITLE "Prevalence of Diabetes";
```

SUDAAN Output

Variance Estimation Method: Taylor Series (WR)
Prevalence of Diabetes
by: Doctor Diagnosed Diabetes.

Doctor Diagnosed Diabetes	Weighted Size	Sample Size	Row Percent	Lower 95% Limit ROWPER	Upper 95% Limit ROWPER
Total	17422220.79	**10708**	100.0000	.	.
Yes	**1692531.13**	1412	**9.7148**	**8.9477**	**10.5401**
No	15729689.66	9296	90.2852	89.4599	91.0523

CROSSTAB used
CPU time : 8.0 seconds
Elapsed time : 9 seconds
Virtual memory : 1.97 MB

Diabetes by Race/Ethnicity
2008 Texas BRFSS

	Crude Prevalence Rate		Age-Adjusted Rate	
	%	**95% CI**	**%**	**95% CI**
Total	**9.7**	**(8.9 - 10.5)**	**10.0**	**(9.3 - 10.8)**
White	8.3	(7.4 - 9.3)	7.5	(6.6 - 8.5)
Black	13.0	(10.4 - 16.1)	14.5	(11.9 - 17.4)
Hispanic	11.1	(9.6 - 12.9)	14.5	(12.8 - 16.3)

“Subgroupn”

- Allows you to create restrictions on your output
  - Just men
  - Just 18-64 year olds
  - Just men aged 18-64 years
  - Just men aged 18-64 years who do not have cardiovascular disease

Prevalence of Diabetes by Race/Ethnicity Among Men Aged 18-24 Years

```
proc crosstab data =
    "h:\brfss_data\brfss08\state\state_08_working_mc.sav" design =
    wr filetype= spss;
nest ststr seqno;
weight cdcfinwt;
setenv linesize = 106 pagesize = 45 colwidth = 11 topmgn = 1;
subpopn age>=65 and sex=1;
subgroup diabetes raceeth;
levels 2 3;
tables raceeth*diabetes;
print wsum nsum rowper lowrow uprow/  style = nchs nodate
    notime nohead
rowperfmt=f8.4 lowrowfmt=f8.4 uprowfmt=f8.4;
TITLE "Prevalence of Diabetes by Race/Ethnicity Among Men
    Aged 18-24 Years";
```

Output…

Variance Estimation Method: Taylor Series (WR)
For Subpopulation: AGE >= 65 AND SEX = 1
Prevalence of Diabetes by Race/Ethnicity Among Men Aged 18-24 Years
by: Race/Ethnicity, Doctor Diagnosed Diabetes.

Race/Ethnicity	Doctor Diagnosed Diabetes	Weighted Size	Sample Size	Row Percent	Lower 95% Limit ROWPER	Upper 95% Limit ROWPER
Total						
	Total	992138.90	1138	100.0000	.	.
	Yes	238671.93	252	24.0563	20.7002	27.7660
	No	753466.97	886	75.9437	72.2340	79.2998
White						
	Total	687820.79	923	100.0000	.	.
	Yes	130359.68	182	18.9526	15.9786	22.3329
	No	557461.11	741	81.0474	77.6671	84.0214
Black						
	Total	103134.62	62	100.0000	.	.
	Yes	36644.75	20	35.5310	22.3678	51.3197
	No	66489.87	42	64.4690	48.6803	77.6322
Hispanic						
	Total	201183.48	153	100.0000	.	.
	Yes	71667.51	50	35.6230	25.6681	46.9975
	No	129515.98	103	64.3770	53.0025	74.3319

CROSSTAB used
CPU time : 8.0 seconds
Elapsed time : 8 seconds
Virtual memory : 2.00 MB

Age-Adjusting Ex. #2…

You choose the topic…

Questions????

SUDAAN & Age-Adjusting

Questions????

Throughout the Session…

PLEASE REMEMBER YOUR EVALUATIONS!