DESCRIPT Example #6

SUDAAN Statements and Results Illustrated

- VAR
- CATLEVEL
- NOMARG option
- SETENV
- RFORMAT

Input Data Set(s): NHANES3S3.SAS7bdat

Example

Estimate the prevalence of arthritis among adults by gender, age, race/ethnicity, and the cross-classification of age and gender, using NHANES III.

Solution

The data set is adults aged 17 and older from NHANES III. All variables in this example are from the home interview; six years of data are analyzed. The weight variable is WTPFQX6, and the stratification and PSU variables are SDPSTRA6 and SDPPSU6, respectively. HAC1A indicates whether a doctor ever told you that you have arthritis (1=yes, 2=no).

The prevalence of arthritis is estimated by using DESCRIPT with the VAR and CATLEVEL statements (***Exhibit 1***). Since arthritis is a dichotomous variable, it is not necessary to estimate the percentage who do not have arthritis. Using DESCRIPT for this analysis allows a more concise printout, compared to using CROSSTAB. The TABLES statement indicates the subpopulations for which arthritis prevalence is to be estimated. The NOMARG option on the PROC statement prevents information about the total population being included in each printout table; these results are detailed in ***Example 5*.**

This example was run in SAS-Callable SUDAAN, and the programming code is presented below. Note that the basic SUDAAN code is the same for both Standalone and SAS-Callable versions.

Exhibit 1. SAS-Callable SUDAAN Code

```
libname in "\\rtints29\sudaan\data\nhanes3";
options linesize=95 pagesize=60 nocenter;

proc format;
  value yesno 1="1=Yes";
  value sex 1="Male"
            2="Female";
  value age 1="1=17-34"
            2="2=35-49"
            3="3=50-64"
            4="4=65-90+";
  value race 1="1=nH_white"
             2="2=nH_black"
             3="3=Mex Amer"
             4="4=Other";

PROC DESCRIPT DATA=in.HANES3S3 FILETYPE=SAS DESIGN=WR DEFT1 NOMARG;
  NEST   SDPSTRA6 SDPPSU6;
  WEIGHT WTPFQX6;

  VAR      HAC1A;
  CATLEVEL 1;

  SUBGROUP HSSEX AGEGRP4 DMARETHN;
  LEVELS   2     4       4;
  TABLES  HSSEX AGEGRP4 DMARETHN AGEGRP4*HSSEX;

  SETENV ROWWIDTH=12 COLWIDTH=10 LBLWIDTH=10 COLSPCE=1;
  PRINT  NSUM="SamSize" WSUM="PopSize" TOTAL SETOTAL PERCENT SEPERCENT
         LOWPCT="Lower 95% Limit PCT" UPPCT="Upper 95% Limit PCT" DEFFPCT="DEFF1" /
         TOTALFMT=F10.0 WSUMFMT=F10.0 SETOTALFMT=F10.0;
  RFORMAT hac1a yesno.;
  RFORMAT hssex sex.;
  RFORMAT agegrp4 age.;
  RFORMAT dmarethn race.;
  RTITLE "PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:"
         "BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE";
  RFOOTNOTE "NHANES-III, 1988-1994, JULY 1997 DATA RELEASE";
```

Exhibit 2. First Page of SUDAAN Output (SAS *.lst file)

```
                              S U D A A N
           Software for the Statistical Analysis of Correlated Data
         Copyright     Research Triangle Institute      December 2011
                              Release 11.0.0

DESIGN SUMMARY: Variances will be computed using the Taylor Linearization Method, Assuming a
With Replacement (WR) Design
    Sample Weight: WTPFQX6
    Stratification Variables(s): SDPSTRA6
    Primary Sampling Unit: SDPPSU6

Number of observations read    :  20050    Weighted count :187647206
Denominator degrees of freedom :     49
```

See ***Example 5*** for a discussion of the above printout.

Exhibit 3. DESCRIPT Percentages: By SEX

```
Variance Estimation Method: Taylor Series (WR)

PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:
BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE

by: Variable, Sex.
-----------------------------------------------------------
|              |            | Sex                        |
| Variable     |            |----------------------------|
|              |            | Male       | Female        |
-----------------------------------------------------------
|              |            |            |               |
| Doctor ever  | SamSize    |       9399 |      10647    |
| told you     | PopSize    |   89630819 |   97980668    |
| had:         | Total      |   11789474 |   20877167    |
| arthritis:   | SE Total   |     684301 |     849400    |
| 1=Yes        | Percent    |      13.15 |      21.31    |
|              | SE Percent |       0.64 |       0.59    |
|              | Lower 95%  |            |               |
|              |  Limit PCT |      11.92 |      20.14    |
|              | Upper 95%  |            |               |
|              |  Limit PCT |      14.49 |      22.52    |
|              | DEFF1      |       3.44 |       2.18    |
-----------------------------------------------------------
NHANES-III, 1988-1994, JULY 1997 DATA RELEASE
```

Exhibit 3 indicates that females have a higher estimated prevalence of arthritis than do males: 21.31% vs. 13.15%. The 95% confidence limits on the percentages are non-overlapping, indicating a statistically significant difference between groups.

Exhibit 4. DESCRIPT Percentages: By AGE

```
Variance Estimation Method: Taylor Series (WR)

PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:
BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE

by: Variable, AGEGRP4.
```

Variable		AGEGRP4			
		1=17-34	2=35-49	3=50-64	4=65-90+
Doctor ever told you had: arthritis: 1=Yes	SamSize	6900	4496	3401	5249
	PopSize	71857480	53642570	32114722	29996716
	Total	2822848	6647246	9555128	13641419
	SE Total	307167	414373	412924	792262
	Percent	3.93	12.39	29.75	45.48
	SE Percent	0.41	0.65	0.89	0.91
	Lower 95% Limit PCT	3.18	11.14	27.99	43.66
	Upper 95% Limit PCT	4.84	13.76	31.58	47.30
	DEFF1	3.40	2.23	1.31	1.06

```
NHANES-III, 1988-1994, JULY 1997 DATA RELEASE
```

Exhibit 4 indicates that the estimated prevalence of arthritis increases with increasing age, from 3.93% to 45.48%. Again, non-overlapping confidence limits indicates statistically significant differences between these groups.

Exhibit 5. DESCRIPT Percentages: By RACE

```
Variance Estimation Method: Taylor Series (WR)

PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:
BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE

by: Variable, Race-ethnicity.
```

Variable		Race-ethnicity			
		1=nH_white	2=nH_black	3=Mex_Amer	4=Other
Doctor ever told you had: arthritis: 1=Yes	SamSize	8480	5485	5306	775
	PopSize	142595429	20995070	9827951	14193038
	Total	26880246	3455547	964747	1366101
	SE Total	1389548	203364	77671	202645
	Percent	18.85	16.46	9.82	9.63
	SE Percent	0.69	0.72	0.49	1.32
	Lower 95% Limit PCT	17.50	15.07	8.87	7.28
	Upper 95% Limit PCT	20.28	17.95	10.85	12.62
	DEFF1	4.75	0.84	0.29	3.03

```
NHANES-III, 1988-1994, JULY 1997 DATA RELEASE
```

Exhibit 5 indicates that the estimated prevalence of arthritis varies by race/ethnicity, from a low of 9.63% for "other" race to a high of 18.85% for non-Hispanic whites. Both non-Hispanic whites and blacks appear to have a significantly higher prevalence of arthritis than Mexican Americans and "other" race.

Exhibit 6. DESCRIPT Percentages: Age by Sex

Variance Estimation Method: Taylor Series (WR)

PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:
BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE

by: Variable, AGEGRP4, Sex.
for: Variable = Doctor ever told you had: arthritis: 1=Yes.

AGEGRP4		Sex	
		Male	Female
1=17-34	SamSize	3262	3638
	PopSize	35922564	35934916
	Total	1184692	1638156
	SE Total	221737	205479
	Percent	3.30	4.56
	SE Percent	0.62	0.53
	Lower 95% Limit PCT	2.25	3.60
	Upper 95% Limit PCT	4.81	5.75
	DEFF1	4.66	2.49
2=35-49	SamSize	2069	2427
	PopSize	25920111	27722459
	Total	2706268	3940978
	SE Total	284315	288808
	Percent	10.44	14.22
	SE Percent	0.99	0.94
	Lower 95% Limit PCT	8.62	12.44
	Upper 95% Limit PCT	12.59	16.20
	DEFF1	2.87	2.13

NHANES-III, 1988-1994, JULY 1997 DATA RELEASE

Exhibit 6. DESCRIPT Percentages: Age by Sex (cont'd).

Variance Estimation Method: Taylor Series (WR)

PERCENTAGE OF ADULTS (17+) WITH ARTHRITIS:
BY GENDER, AGE, RACE/ETHNCITY, AND GENDER*AGE

by: Variable, AGEGRP4, Sex.
for: Variable = Doctor ever told you had: arthritis: 1=Yes.

AGEGRP4		Sex	
		Male	Female
3=50-64	SamSize	1625	1776
	PopSize	15156961	16957761
	Total	3238161	6316967
	SE Total	235821	330573
	Percent	21.36	37.25
	SE Percent	1.41	1.48
	Lower 95%		
	Limit PCT	18.66	34.33
	Upper 95%		
	Limit PCT	24.34	40.27
	DEFF1	1.92	1.69
4=65-90+	SamSize	2443	2806
	PopSize	12631184	17365532
	Total	4660352	8981066
	SE Total	322746	538612
	Percent	36.90	51.72
	SE Percent	1.34	1.28
	Lower 95%		
	Limit PCT	34.24	49.14
	Upper 95%		
	Limit PCT	39.63	54.29
	DEFF1	1.04	1.22

NHANES-III, 1988-1994, JULY 1997 DATA RELEASE

Exhibit 6 indicates that the increasing prevalence of arthritis with age occurs within each gender. Within each age group, the estimated prevalence of arthritis is higher for females than for males.

Design Effects: The default design effect is used (DEFF1). The design effect for estimated arthritis prevalence is less than 1.0 for non-Hispanic blacks and for Mexican-Americans because each of these subpopulations was substantially oversampled. Correspondingly, the design effect for non-Hispanic whites is high, since this group was under-sampled. Design effects likely are lower for older ages because older persons were oversampled.