

Example 3: Linear Regression

In the following sample code, Body Mass Index (`bmi_p`) is examined in relation to race (`racehpr2`), sex (`srsex`), and age (`srage_p`) while controlling for each other. Note that `racehpr2` and `srsex` are categorical variables; White (`racehpr2=6`) and Male (`srsex=1`) are used as their reference categories.

SAS:

```
PROC SURVEYREG DATA = data VARMETHOD=JACKKNIFE;
WEIGHT rakedw0;
REPWEIGHT rakedw1-rakedw80/JKCOEFS=1;a
FORMAT racehpr2 racehprf. srsex srsex.;
CLASS racehpr2 srsex;b
MODEL bmi_p = srsex racehpr2 srage_p/SOLUTION;c
RUN;
```

^a Jackknife coefficients are necessary for accurate variance calculations, and jackknife coefficients of 1 in SAS will produce equal variance calculations as those produced in SUDAAN. However, for SAS V.9.2(TS1M0) and earlier, a value of 1 will not be accepted; as a substitute, 0.9999 can be entered. Without this specification, the default value of the jackknife coefficients will be $[(\# \text{ replicate weights} - 1)/\# \text{ replicate weights}]$; for CHIS, this would be $[(80 - 1)/80] = 0.9875$.

^b When the values are formatted either in the data step or in the procedure, SAS automatically picks the category of the categorical variables whose label is alphabetically last as a reference group.

^c SOLUTION option provides the parameter estimates when using a CLASS statement.

SUDAAN:

```
PROC REGRESS DATA = data FILETYPE=SAS DESIGN=JACKKNIFE;
WEIGHT rakedw0;
JACKWGTS rakedw1-rakedw80/ADJJACK=1;
SUBGROUP racehpr2 srsex;
LEVELS 7 2;
REFLEVEL racehpr2=6 srsex=1;
MODEL bmi_p = racehpr2 srsex srage_p;
RUN;
```

Stata:

***Sample design specification step*^d**

```
use "DATASET LOCATION"
svyset [pw=rakedw0], jkrw(rakedw1-rakedw80, multiplier(1)) vce(jack)
mse
```

Analysis

```
recode racehpr2 (6=1) (1=2) (2=3) (3=4) (4=5) (5=6) (7=7), gen(race)e
xi: svy: regress bmi_p i.srsex i.race srage_p
```

^d In Stata, the sample design specification step should be included before conducting any analysis.

^e Recoding is done in order to choose "White" (`racehpr2=6`) as the reference group.