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:

```sql
PROC SURVEYREG DATA = data VARMETHOD=JACKKNIFE;
WEIGHT rakedw0;
REPWIGHT 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 [(# replicate weights - 1)/# 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:

```sql
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.