CHAPTER 8 ASDA ANALYSIS EXAMPLES REPLICATION-IVEware

GENERAL NOTES ABOUT ANALYSIS EXAMPLES REPLICATION

These examples are intended to provide guidance on how to use the commands/procedures for analysis of complex sample survey data and assume all data management and other preliminary work is done. The relevant syntax for the procedure of interest is shown first along with the associated output for that procedure(s). In some examples, there may be more than one block of syntax and in this case all syntax is first presented followed by the output produced.

In some software packages certain procedures or options are not available but we have made every attempt to demonstrate how to match the output produced by Stata 10+ in the textbook. Check the ASDA website for updates to the various software tools we cover.

NOTES ABOUT LOGISTIC REGRESSION ANALYSES IN IVEware

Special note: IVEware MUST BE RUN IN THE REGULAR PROGRAM EDITOR IF RUNNING UNDER SAS!! THE ENHANCED EDITOR DOES NOT WORK WITH SAS BASED IVEware!!

IVEware %regress can perform nearly all of the logistic regression analyses presented in Chapter 8 of ASDA. This module uses the JRR method for variance estimation while the %describe command uses the Taylor Series Linearization method for variance estimation. This is reflected in the log file when running IVEware. Some of the fine points of this procedure are the use of a BY statement for subpopulation analyses, use of a CATEGORICAL statement for class variables in the regression, use of the highest category as the reference group for the outcome variable which requires a reverse coded outcome variable, and various links depending on the type of regression desired. For logistic regression, use of the LOGISTIC LINK is required.

The %regress module does not include an easy way to tests of parameters as a group (i.e. testing whether race is significantly different from zero) so the adjusted F or Wald tests for groups of predictors demonstrated in the ASDA text in Chapter 8 are omitted here.

Probit regression can be done using the %sasmod module of IVEware but due to convergence problems within each of the 84 replicates in the NCS-R data set, the example is excluded from this chapter. This is a common problem with a large number of replicates and complex models. See the IVEware web site for examples of how to use %sasmod.

```
%regress (name=ex8_1, setup=new, dir=. ) ;
title "Analysis Example 8.1: Logistic Regression with Binary Outcome: NCSR" ;
datain  ncsr ;
stratum sestrat ;
cluster seclustr ;
weight  ncsrwtlg ;
dependent mde_rev ;
predictor age44 age59 age60 sexm ald ed12 ed1315 ed16 prevmar nevmar ;
link logistic ;
run ;

IVEware Setup Checker, Wed Mar 10 12:49:01 2010                                  1

Setup listing:

title "Analysis Example 8.1: Logistic Regression with Binary Outcome: NCSR" ;
datain  ncsr ;
stratum sestrat ;
cluster seclustr ;
weight  ncsrwtlg ;
dependent mde_rev ;
predictor age44 age59 age60 sexm ald ed12 ed1315 ed16 prevmar nevmar ;
link logistic ;
run ;
IVEware Jackknife Regression Procedure, Wed Mar 10 12:49:01 2010                 1

"Analysis Example 8.1: Logistic Regression with Binary Outcome: NCSR"

Regression type:        Logistic
Dependent variable:     mde_rev
Predictors:             age44
                        age59
                        age60
                        sexm
                        ald
                        ed12
                        ed1315
                        ed16
                        prevmar
                        nevmar
Cat. var. ref. codes:   mde_rev  1
Stratum variable:       SESTRAT  SAMPLING ERROR STRATUM
Cluster variable:       SECLUSTR  SAMPLING ERROR CLUSTER
Weight variable:        NCSRWTLG  NCSR sample part 2 weight

Valid cases               5692
Sum weights        5692.000478
Replicates                  42

Degr freedom                42

-2 LogLike         5268.526425

Variable              Estimate         Std Error         Wald test        Prob > Chi
Intercept           -1.5830767         0.1223398         167.44360           0.00000
age44                0.2556185         0.0941162           7.37659           0.00661
age59                0.2064465         0.0918258           5.05458           0.02456
age60               -0.6757863         0.1407557          23.05083           0.00000
sexm                -0.5773452         0.0790030          53.40527           0.00000
ald                  1.4236762         0.1592221          79.94949           0.00000
ed12                 0.0792550         0.1003241           0.62408           0.42953
ed1315               0.2305111         0.0942888           5.97672           0.01450
ed16                 0.1629254         0.1120799           2.11311           0.14604
prevmar              0.4864225         0.0854730          32.38690           0.00000
nevmar               0.1155794         0.1082687           1.13961           0.28574
```

Variable	Odds Ratio	95% Confidence Interval Lower	Upper
Intercept			
age44	1.2912600	1.0678898	1.5613524
age59	1.2293019	1.0213597	1.4795798
age60	0.5087563	0.3829532	0.6758865
sexm	0.5613867	0.4786530	0.6584208
ald	4.1523575	3.0112447	5.7258955
ed12	1.0824803	0.8840807	1.3254034
ed1315	1.2592434	1.0410490	1.5231694
ed16	1.1769489	0.9386988	1.4756690
prevmar	1.6264870	1.3687957	1.9326917
nevmar	1.1225236	0.9022033	1.3966467

"Analysis Example 8.1: Logistic Regression with Binary Outcome: NCSR"

Variable	Design Effect	SRS Estimate	% Diff SRS v Est
Intercept	1.21741	-1.0248795	-35.26027
age44	1.19952	0.2939657	15.00176
age59	0.98084	0.2273644	10.13236
age60	1.58217	-0.3924731	-41.92349
sexm	1.63252	-0.5432110	-5.91227
ald	2.35892	0.8256041	-42.00900
ed12	1.09843	0.1257221	58.62986
ed1315	0.96931	0.1941795	-15.76131
ed16	1.26256	0.1589701	-2.42771
prevmar	1.32065	0.5092616	4.69532
nevmar	1.69379	0.1903295	64.67425

```
*note: interaction variables can be done in the model statement by using the * operator but tests of the
interactions as a group are not possible thus omitted ;

%regress (name=8_1, setup=new, dir=. ) ;
title "Analysis Example 8.1: Logistic Regression with Binary Outcome and Interaction Variables: NCSR" ;
datain  ncsr ;
stratum sestrat ;
cluster seclustr ;
weight  ncsrwtlg ;
dependent mde_rev ;
predictor age44 age59 age60 sexm ald ed12 ed1315 ed16 prevmar nevmar
          age44*sexm age59*sexm age60*sexm ald*sexm ed12*sexm ed1315*sexm ed16*sexm prevmar*sexm nevmar*sexm  ;
link logistic ;
run ;


IVEware Setup Checker, Wed Mar 10 12:55:59 2010                                    1

Setup listing:

title "Analysis Example 8.1: Logistic Regression with Binary Outcome and
 Interaction Variables: NCSR" ;
datain  ncsr ;
stratum sestrat ;
cluster seclustr ;
weight  ncsrwtlg ;
dependent mde_rev ;
predictor age44 age59 age60 sexm ald ed12 ed1315 ed16 prevmar nevmar
          age44*sexm age59*sexm age60*sexm ald*sexm ed12*sexm ed1315*sexm
 ed16*sexm prevmar*sexm nevmar*sexm  ;
link logistic ;
run ;

IVEware Jackknife Regression Procedure, Wed Mar 10 12:56:00 2010                   1

"Analysis Example 8.1: Logistic Regression with Binary Outcome and Interaction Var

Regression type:        Logistic
Dependent variable:     mde_rev
Predictors:             age44
                        age59
                        age60
                        sexm
                        ald
                        ed12
                        ed1315
                        ed16
                        prevmar
                        nevmar
                        XACT1  age44*sexm
                        XACT2  age59*sexm
                        XACT3  age60*sexm
                        XACT4  ald*sexm
                        XACT5  ed12*sexm
                        XACT6  ed1315*sexm
                        XACT7  ed16*sexm
                        XACT8  prevmar*sexm
                        XACT9  nevmar*sexm
Cat. var. ref. codes:   mde_rev  1
Stratum variable:       SESTRAT  SAMPLING ERROR STRATUM
Cluster variable:       SECLUSTR  SAMPLING ERROR CLUSTER
Weight variable:        NCSRWTLG  NCSR sample part 2 weight

Valid cases               5692
Sum weights        5692.000478
```

Replicates 42

Degr freedom 42

-2 LogLike 5264.857536

Variable	Estimate	Std Error	Wald test	Prob > Chi
Intercept	-1.5998893	0.1346657	141.14519	0.00000
age44	0.2204041	0.1134640	3.77332	0.05208
age59	0.2146410	0.1040597	4.25462	0.03914
age60	-0.6455558	0.1748696	13.62821	0.00022
sexm	-0.5464415	0.3737739	2.13732	0.14375
ald	1.5531400	0.2145938	52.38260	0.00000
ed12	0.1305184	0.0836146	2.43657	0.11854
ed1315	0.2973241	0.1167067	6.49036	0.01085
ed16	0.2422184	0.1508935	2.57676	0.10844
prevmar	0.4177856	0.1103824	14.32541	0.00015
nevmar	0.0173370	0.1303200	0.01770	0.89417
XACT1	0.0967431	0.2009836	0.23170	0.63027
XACT2	0.0026370	0.2141225	0.00015	0.99017
XACT3	-0.0378099	0.3032617	0.01554	0.90078
XACT4	-0.2004168	0.2450479	0.66891	0.41343
XACT5	-0.1377802	0.2825224	0.23783	0.62578

"Analysis Example 8.1: Logistic Regression with Binary Outcome and Interaction Var

Variable	Estimate	Std Error	Wald test	Prob > Chi
XACT6	-0.1687904	0.2810361	0.36072	0.54811
XACT7	-0.1940178	0.3579164	0.29385	0.58777
XACT8	0.1825040	0.2124054	0.73827	0.39022
XACT9	0.2318977	0.2115482	1.20164	0.27299

Variable	Odds Ratio	95% Confidence Interval Lower	Upper
Intercept			
age44	1.2465803	0.9914615	1.5673452
age59	1.2394169	1.0046512	1.5290423
age60	0.5243710	0.3684477	0.7462794
sexm	0.5790065	0.2723284	1.2310452
ald	4.7262875	3.0650779	7.2878389
ed12	1.1394189	0.9624988	1.3488593
ed1315	1.3462516	1.0637505	1.7037768
ed16	1.2740724	0.9396043	1.7276002
prevmar	1.5185951	1.2153417	1.8975167
nevmar	1.0174881	0.7821889	1.3235704
XACT1	1.1015773	0.7342854	1.6525899
XACT2	1.0026404	0.6508481	1.5445813
XACT3	0.9628960	0.5221419	1.7757024
XACT4	0.8183896	0.4991030	1.3419302
XACT5	0.8712902	0.4926617	1.5409085
XACT6	0.8446859	0.4790534	1.4893837
XACT7	0.8236432	0.3999878	1.6960220
XACT8	1.2002190	0.7818076	1.8425578
XACT9	1.2609908	0.8228156	1.9325081

Variable	Design Effect	SRS Estimate	% Diff SRS v Est
Intercept	0.95934	-0.9594586	-40.02969
age44	1.11290	0.2764957	25.44948
age59	0.81072	0.2225707	3.69440
age60	1.64672	-0.3082472	-52.25088
sexm	2.77084	-0.6961233	27.39209
ald	1.74107	0.9021342	-41.91546
ed12	0.46659	0.1042057	-20.16014

ed1315	0.91016	0.1761099	-40.76839
ed16	1.38489	0.0975990	-59.70619
prevmar	1.48447	0.3672797	-12.08895
nevmar	1.51673	0.1465917	745.54464
XACT1	1.25508	0.0459198	-52.53431
XACT2	1.21603	0.0235376	792.60523
XACT3	1.56454	-0.2112388	458.68654
XACT4	1.33110	-0.1348661	-32.70719
XACT5	2.04863	0.0276108	-120.03975
XACT6	2.02725	0.0297750	-117.64024
XACT7	3.06469	0.1479616	-176.26186
XACT8	1.78053	0.4219446	131.19743
XACT9	1.50890	0.1106629	-52.27943

Note: no comparison of Logistic, Probit and Cloglog due to no Probit or Cloglog option available in IVEware without use of the %sasmod module with PROC PROBIT, %sasmod does not include PROC SURVEYLOGISTIC with the optional link=cloglog thus the cloglog link is not available in IVEware