

IVEware Analysis Example Replication C9

```
* IVEware Analysis Examples Replication for ASDA 2nd Edition
* Berglund April 2017
* Chapter 9 ;
```

```
*set options and location to call IVEware from SAS session ;
options set=srclib "C:\iveware_15feb2017\sas" sasautos=(!srclib' sasautos) mautosource ;
title ;
options ls=119 ps=67 ;
```

```
libname ncsr "P:\ASDA 2\Data sets\ncsr\" ;
```

```
data c9_ncsr ;
  set ncsr.ncsr_sub_13nov2015 ;
  * reverse coding for correct omitted group ;
  r_ag4cat=5-ag4cat ;
  r_mar3cat=4-mar3cat ;
  r_sex=3-sex ;
  r_ald=2-ald ;
  r_mde=2-mde ;
  r_ed4cat=5-ed4cat ;
  r_wkstat3c=4-wkstat3c ;
run ;
```

```
/* formats included here as reminder of categories for age, sex, education, marital status and yes/no variables:
proc format ;
```

```
  value af 1='18-29' 2='30-44' 3='45-59' 4='60+' ;
  value sf 1='M' 2='F' ;
  value edf 1='0-11' 2='12' 3='13-15' 4='16+' ;
  value mf 1='Currently Married' 2='Previously Married' 3='Never Married' ;
  value yn 1='Yes' 0='No' ;
```

```
run ;
```

```
*/
```

```
ods rtf style=normalprinter bodytitle ;
```

```
ods text='Example 9.2.6 : IVEware does not offer weight bar charts or Wald tests for groups of variables so these
are omitted here' ;
```

```
* Run final model from book for Table 9.2 ;
%regress (setup=new, name="Example 9.2.6", dir=P:\ASDA 2\Analysis Example Replication\IVEware\IVEware files) ;
title Example 9.2.6 Multinomial logistic regression using NCSR data. ;
```

```
  datain c9_ncsr ;
  stratum sestrat ; cluster seclustr ; weight ncsrwtlg ;
  class r_ag4cat sex r_ald r_mde r_ed4cat r_mar3cat ;
  dependent r_wkstat3c ;
  predictor sex r_ald r_mde r_ed4cat r_ag4cat r_mar3cat ;
  link logistic ;
```

```
run;
```

```
ods text="Figures 9.3 and 9.4, Margins Plot: Not Available in IVEware";
```

```
ods text="GOF test not available in IVEware";
```

```
ods text="Example 9.3.6: Ordinal Logistic Regression is not available in IVEware" ;
```

```
ods text="9.4.7 Example: Fitting Poisson and Negative Binomial Regression Models to Complex Sample Survey Data: Only
Poisson regression available in IVEware" ;
```

```
libname d2 'p:\asda 2\data sets\hrs 2012 ' ;
```

```
data c9_hrs ;
  set d2.hrs_sub_28sep2016 ;
  * prepare variables needed for models ;
  nage_c = nage - 74.5 ;
  bmi_c = r1lbmi - 27.7 ;
  offset24 = 24 ;
  r_arthritis=2-arthritis ;
  r_diabetes=2-diabetes ;
run ;
```

```
* Stratum check ;
```

```
proc freq ;
```

```
  tables age65p*stratum* secu / list ;
```

```
run ;
```

```
* run Poisson regression ;
ods text="Note: problem with Bad Strata: program aborts, PSU: Read data Only one cluster for stratum 27 Only one cluster
for stratum 53 Only one cluster for
stratum 56. May consider stratum collapse but not shown here. " ;

%regress (setup=new, name="Example 9.4.7", dir=P:\ASDA 2\Analysis Example Replication\IVEware\IVEware files) ;
title Example 9.4.7 Poisson Regression Using HRS data, Table 9.8 ;
datain c9_hrs ;
stratum stratum ; cluster secu ; weight nwgtr ;
class gender ;
dependent numfalls24 ;
by age65p ;
predictor gender nage_c arthritis diabetes bmi_c ;
link log ;
run;

ods rtf close ;
```

Example 9.2.6 : IVEware does not offer weight bar charts or Wald tests for groups of variables so these are omitted here

IVEware Setup Checker, Wed May 10 10:33:32 2017

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Setup listing:

```
title Example 9.2.6 Multinomial logistic regression using NCSR data. ;
datain c9_ncsr ;
stratum sestrat ; cluster seclustr ; weight ncsrwtlg ;
class r_ag4cat sex r_ald r_mde r_ed4cat r_mar3cat ;
dependent r_wkstat3c ;
predictor sex r_ald r_mde r_ed4cat r_ag4cat r_mar3cat ;
link logistic ;
run;
```

IVEware Jackknife Regression Procedure, Wed May 10 10:33:34 2017

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Example 9.2.6 Multinomial logistic regression using NCSR data.

Regression type: Polytomous
 Dependent variable: r_wkstat3c
 Predictors: SEX Sex 1=Male 2=Female
 r_ald
 r_mde
 r_ed4cat
 r_ag4cat
 r_mar3cat

Cat. var. ref. codes: SEX 2
 r_ag4cat 4
 r_mar3cat 3
 r_ald 2
 r_mde 2
 r_ed4cat 4
 r_wkstat3c 3

Stratum variable: SESTRAT SAMPLING ERROR STRATUM
 Cluster variable: SECLUSTR SAMPLING ERROR CLUSTER
 Weight variable: NCSRWTLG NCSR sample part 2 weight

Valid cases 5679
 Sum weights 5667.184998
 Replicates 42

Degr freedom 42

-2 LogLike 7351.903365

Variable	Estimate	Std Error	T Test	Prob > T
r_wkstat3c.1				
Intercept	-0.3794741	0.1721162	-2.20476	0.03300
SEX	-0.6402555	0.1103050	-5.80441	0.00000
r_ald	0.3332477	0.1305425	2.55279	0.01441
r_mde	0.0985220	0.0875571	1.12523	0.26688
r_ed4cat.1	-1.2295007	0.1606919	-7.65129	0.00000
r_ed4cat.2	-0.9169420	0.1471796	-6.23009	0.00000
r_ed4cat.3	-0.6514012	0.1403631	-4.64083	0.00003
r_ag4cat.1	2.3806067	0.1733245	13.73497	0.00000
r_ag4cat.2	0.0649931	0.1732136	0.37522	0.70939
r_ag4cat.3	-0.3164450	0.1288982	-2.45500	0.01831
r_mar3cat.1	0.5527891	0.1325248	4.17121	0.00015
r_mar3cat.2	-0.0522634	0.1049048	-0.49820	0.62094
r_wkstat3c.2				
Intercept	-0.6438012	0.2965853	-2.17071	0.03565
SEX	-1.3931969	0.1960786	-7.10530	0.00000
r_ald	-0.1637813	0.3517969	-0.46556	0.64394
r_mde	-0.1397560	0.1572275	-0.88888	0.37913
r_ed4cat.1	-1.7309570	0.3083845	-5.61298	0.00000
r_ed4cat.2	-1.3653017	0.2593296	-5.26474	0.00000
r_ed4cat.3	-0.8470398	0.2364028	-3.58304	0.00088
r_ag4cat.1	1.8283949	0.2860155	6.39264	0.00000
r_ag4cat.2	-0.8377006	0.2553588	-3.28048	0.00209

IVEware Jackknife Regression Procedure, Wed May 10 10:33:48 2017

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Example 9.2.6 Multinomial logistic regression using NCSR data.

Variable	Estimate	Std Error	T Test	Prob > T
r_ag4cat.3	-0.8523907	0.2968191	-2.87175	0.00637
r_mar3cat.1	-2.7845661	0.3801235	-7.32542	0.00000
r_mar3cat.2	-0.5899026	0.2237106	-2.63690	0.01168

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
r_wkstat3c.1			
Intercept			
SEX	0.5271577	0.4219537	0.6585918
r_ald	1.3954930	1.0722966	1.8161025
r_mde	1.1035387	0.9248024	1.3168193
r_ed4cat.1	0.2924386	0.2114452	0.4044562
r_ed4cat.2	0.3997396	0.2970181	0.5379864
r_ed4cat.3	0.5213148	0.3927174	0.6920220
r_ag4cat.1	10.8114598	7.6203645	15.3388545
r_ag4cat.2	1.0671516	0.7523410	1.5136920
r_ag4cat.3	0.7287351	0.5618211	0.9452383
r_mar3cat.1	1.7380940	1.3302190	2.2710325
r_mar3cat.2	0.9490789	0.7679969	1.1728571
r_wkstat3c.2			
Intercept			
SEX	0.2482803	0.1671441	0.3688022
r_ald	0.8489276	0.4173896	1.7266316
r_mde	0.8695704	0.6331465	1.1942775
r_ed4cat.1	0.1771148	0.0950549	0.3300164
r_ed4cat.2	0.2553036	0.1512760	0.4308677
r_ed4cat.3	0.4286821	0.2660372	0.6907617
r_ag4cat.1	6.2238889	3.4945100	11.0850428
r_ag4cat.2	0.4327044	0.2584547	0.7244327
r_ag4cat.3	0.4263943	0.2342433	0.7761678
r_mar3cat.1	0.0617559	0.0286763	0.1329946
r_mar3cat.2	0.5543813	0.3529715	0.8707180

Variable	Design Effect	SRS	% Diff
		Estimate	SRS v Est
r_wkstat3c.1			
Intercept			
SEX	2.07678	-0.3686795	-2.84461
r_ald	2.49941	-0.4438028	-30.68349
r_mde	1.19542	0.2821847	-15.32285
r_mde	1.47541	0.0795390	-19.26784
r_ed4cat.1	2.17003	-1.4038339	14.17919
r_ed4cat.2	2.15313	-1.0199367	11.23241
r_ed4cat.3	2.03152	-0.7373261	13.19077
r_ag4cat.1	2.11489	2.2639728	-4.89934
r_ag4cat.2	2.77945	0.1692781	160.45562
r_ag4cat.3	1.69636	-0.2191842	-30.73545
r_mar3cat.1	2.04157	0.4474283	-19.05986
r_mar3cat.2	1.47002	0.0577880	-210.57067
r_wkstat3c.2			
Intercept			
	1.99630	-0.8881030	37.94679

IVEware Jackknife Regression Procedure, Wed May 10 10:33:48 2017

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Example 9.2.6 Multinomial logistic regression using NCSR data.

Variable	Design Effect	SRS	% Diff
		Estimate	SRS v Est
SEX	1.37287	-1.5207141	9.15285
r_ald	1.17249	-0.2156997	31.69982
r_mde	1.15013	-0.1527761	9.31631
r_ed4cat.1	2.23333	-1.2714246	-26.54788
r_ed4cat.2	1.83966	-1.0604353	-22.32959
r_ed4cat.3	1.68134	-0.7941425	-6.24496
r_ag4cat.1	2.02538	1.8149489	-0.73540
r_ag4cat.2	1.36185	-0.6921360	-17.37668
r_ag4cat.3	2.20823	-0.5414749	-36.47574
r_mar3cat.1	1.24676	-2.0139938	-27.67298
r_mar3cat.2	1.86898	-0.5842458	-0.95894

Figures 9.3 and 9.4, Margins Plot: Not Available in IVEware

GOF test not available in IVEware

Example 9.3.6: Ordinal Logistic Regression is not available in IVEware

9.4.7 Example: Fitting Poisson and Negative Binomial Regression Models to Complex Sample Survey Data: Only Poisson regression available in IVEware

The FREQ Procedure

age65p	STRATUM	SECU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1	73	0.36	73	0.36
0	1	2	97	0.47	170	0.83
0	2	1	339	1.65	509	2.48
0	2	2	101	0.49	610	2.97
0	3	1	107	0.52	717	3.49
0	3	2	134	0.65	851	4.14
0	4	1	77	0.37	928	4.51
0	4	2	111	0.54	1039	5.05
0	5	1	46	0.22	1085	5.28
0	5	2	52	0.25	1137	5.53
0	6	1	94	0.46	1231	5.99
0	6	2	85	0.41	1316	6.40
0	7	1	84	0.41	1400	6.81
0	7	2	98	0.48	1498	7.29
0	8	1	94	0.46	1592	7.75
0	8	2	93	0.45	1685	8.20
0	9	1	131	0.64	1816	8.84
0	9	2	85	0.41	1901	9.25
0	10	1	58	0.28	1959	9.53
0	10	2	97	0.47	2056	10.00
0	11	1	48	0.23	2104	10.24
0	11	2	93	0.45	2197	10.69
0	12	1	127	0.62	2324	11.31
0	12	2	135	0.66	2459	11.96
0	13	1	74	0.36	2533	12.32
0	13	2	46	0.22	2579	12.55
0	14	1	39	0.19	2618	12.74
0	14	2	20	0.10	2638	12.83
0	15	1	40	0.19	2678	13.03
0	15	2	36	0.18	2714	13.20
0	16	1	29	0.14	2743	13.35
0	16	2	20	0.10	2763	13.44
0	17	1	71	0.35	2834	13.79
0	17	2	56	0.27	2890	14.06
0	18	1	27	0.13	2917	14.19
0	18	2	39	0.19	2956	14.38
0	19	1	111	0.54	3067	14.92
0	19	2	76	0.37	3143	15.29
0	20	1	124	0.60	3267	15.89
0	20	2	72	0.35	3339	16.25
0	21	1	72	0.35	3411	16.60
0	21	2	78	0.38	3489	16.97
0	22	1	48	0.23	3537	17.21
0	22	2	66	0.32	3603	17.53
0	23	1	10	0.05	3613	17.58
0	23	2	6	0.03	3619	17.61
0	24	1	3	0.01	3622	17.62
0	24	2	6	0.03	3628	17.65
0	25	1	3	0.01	3631	17.67
0	25	2	6	0.03	3637	17.69
0	26	1	13	0.06	3650	17.76

age65p	STRATUM	SECU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	26	2	16	0.08	3666	17.84
0	27	1	117	0.57	3783	18.41
0	27	2	171	0.83	3954	19.24
0	28	1	83	0.40	4037	19.64
0	28	2	111	0.54	4148	20.18
0	29	1	84	0.41	4232	20.59
0	29	2	76	0.37	4308	20.96
0	30	1	139	0.68	4447	21.64
0	30	2	95	0.46	4542	22.10
0	31	1	138	0.67	4680	22.77
0	31	2	56	0.27	4736	23.04
0	32	1	140	0.68	4876	23.72
0	32	2	101	0.49	4977	24.21
0	33	1	99	0.48	5076	24.70
0	33	2	83	0.40	5159	25.10
0	34	1	100	0.49	5259	25.59
0	34	2	120	0.58	5379	26.17
0	35	1	108	0.53	5487	26.70
0	35	2	107	0.52	5594	27.22
0	36	1	240	1.17	5834	28.38
0	36	2	134	0.65	5968	29.04
0	37	1	8	0.04	5976	29.07
0	37	2	5	0.02	5981	29.10
0	38	1	81	0.39	6062	29.49
0	38	2	47	0.23	6109	29.72
0	39	1	65	0.32	6174	30.04
0	39	2	65	0.32	6239	30.35
0	40	1	163	0.79	6402	31.15
0	40	2	143	0.70	6545	31.84
0	41	1	59	0.29	6604	32.13
0	41	2	159	0.77	6763	32.90
0	42	1	118	0.57	6881	33.48
0	42	2	94	0.46	6975	33.94
0	43	1	356	1.73	7331	35.67
0	43	2	162	0.79	7493	36.46
0	44	1	206	1.00	7699	37.46
0	44	2	238	1.16	7937	38.62
0	45	1	83	0.40	8020	39.02
0	45	2	46	0.22	8066	39.24
0	46	1	95	0.46	8161	39.71
0	46	2	113	0.55	8274	40.25
0	47	1	71	0.35	8345	40.60
0	47	2	56	0.27	8401	40.87
0	48	1	50	0.24	8451	41.12
0	48	2	71	0.35	8522	41.46
0	49	1	65	0.32	8587	41.78
0	49	2	69	0.34	8656	42.11
0	50	1	168	0.82	8824	42.93
0	50	2	150	0.73	8974	43.66
0	51	1	157	0.76	9131	44.42
0	51	2	144	0.70	9275	45.13
0	52	1	9	0.04	9284	45.17
0	52	2	13	0.06	9297	45.23
0	53	1	45	0.22	9342	45.45
0	53	2	94	0.46	9436	45.91
0	54	1	25	0.12	9461	46.03

age65p	STRATUM	SECU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	54	2	31	0.15	9492	46.18
0	55	1	56	0.27	9548	46.45
0	55	2	121	0.59	9669	47.04
0	56	1	69	0.34	9738	47.38
0	56	2	81	0.39	9819	47.77
1	1	1	84	0.41	9903	48.18
1	1	2	98	0.48	10001	48.66
1	2	1	97	0.47	10098	49.13
1	2	2	90	0.44	10188	49.57
1	3	1	58	0.28	10246	49.85
1	3	2	67	0.33	10313	50.18
1	4	1	63	0.31	10376	50.48
1	4	2	82	0.40	10458	50.88
1	5	1	74	0.36	10532	51.24
1	5	2	104	0.51	10636	51.75
1	6	1	70	0.34	10706	52.09
1	6	2	85	0.41	10791	52.50
1	7	1	93	0.45	10884	52.95
1	7	2	109	0.53	10993	53.48
1	8	1	97	0.47	11090	53.96
1	8	2	119	0.58	11209	54.53
1	9	1	70	0.34	11279	54.87
1	9	2	81	0.39	11360	55.27
1	10	1	103	0.50	11463	55.77
1	10	2	76	0.37	11539	56.14
1	11	1	62	0.30	11601	56.44
1	11	2	58	0.28	11659	56.72
1	12	1	42	0.20	11701	56.93
1	12	2	66	0.32	11767	57.25
1	13	1	54	0.26	11821	57.51
1	13	2	35	0.17	11856	57.68
1	14	1	69	0.34	11925	58.02
1	14	2	31	0.15	11956	58.17
1	15	1	52	0.25	12008	58.42
1	15	2	49	0.24	12057	58.66
1	16	1	45	0.22	12102	58.88
1	16	2	42	0.20	12144	59.08
1	17	1	58	0.28	12202	59.37
1	17	2	91	0.44	12293	59.81
1	18	1	74	0.36	12367	60.17
1	18	2	45	0.22	12412	60.39
1	19	1	48	0.23	12460	60.62
1	19	2	60	0.29	12520	60.91
1	20	1	103	0.50	12623	61.41
1	20	2	72	0.35	12695	61.76
1	21	1	80	0.39	12775	62.15
1	21	2	102	0.50	12877	62.65
1	22	1	45	0.22	12922	62.87
1	22	2	23	0.11	12945	62.98
1	23	1	44	0.21	12989	63.19
1	23	2	47	0.23	13036	63.42
1	24	1	17	0.08	13053	63.51
1	24	2	42	0.20	13095	63.71
1	25	1	41	0.20	13136	63.91
1	25	2	33	0.16	13169	64.07
1	26	1	139	0.68	13308	64.75

age65p	STRATUM	SECU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	26	2	134	0.65	13442	65.40
1	27	1	157	0.76	13599	66.16
1	27	2	143	0.70	13742	66.86
1	28	1	104	0.51	13846	67.36
1	28	2	134	0.65	13980	68.02
1	29	1	194	0.94	14174	68.96
1	29	2	145	0.71	14319	69.67
1	30	1	178	0.87	14497	70.53
1	30	2	121	0.59	14618	71.12
1	31	1	156	0.76	14774	71.88
1	31	2	164	0.80	14938	72.68
1	32	1	120	0.58	15058	73.26
1	32	2	96	0.47	15154	73.73
1	33	1	208	1.01	15362	74.74
1	33	2	170	0.83	15532	75.57
1	34	1	154	0.75	15686	76.32
1	34	2	109	0.53	15795	76.85
1	35	1	39	0.19	15834	77.04
1	35	2	52	0.25	15886	77.29
1	36	1	130	0.63	16016	77.92
1	36	2	38	0.18	16054	78.11
1	37	1	65	0.32	16119	78.42
1	37	2	118	0.57	16237	79.00
1	38	1	123	0.60	16360	79.60
1	38	2	119	0.58	16479	80.17
1	39	1	74	0.36	16553	80.53
1	39	2	162	0.79	16715	81.32
1	40	1	163	0.79	16878	82.12
1	40	2	200	0.97	17078	83.09
1	41	1	126	0.61	17204	83.70
1	41	2	166	0.81	17370	84.51
1	42	1	162	0.79	17532	85.30
1	42	2	115	0.56	17647	85.86
1	43	1	165	0.80	17812	86.66
1	43	2	94	0.46	17906	87.12
1	44	1	147	0.72	18053	87.83
1	44	2	100	0.49	18153	88.32
1	45	1	178	0.87	18331	89.18
1	45	2	294	1.43	18625	90.61
1	46	1	221	1.08	18846	91.69
1	46	2	258	1.26	19104	92.95
1	47	1	140	0.68	19244	93.63
1	47	2	180	0.88	19424	94.50
1	48	1	102	0.50	19526	95.00
1	48	2	74	0.36	19600	95.36
1	49	1	87	0.42	19687	95.78
1	49	2	112	0.54	19799	96.33
1	50	1	178	0.87	19977	97.19
1	50	2	189	0.92	20166	98.11
1	51	1	161	0.78	20327	98.90
1	51	2	86	0.42	20413	99.31
1	52	1	58	0.28	20471	99.60
1	52	2	73	0.36	20544	99.95
1	53	1	1	0.00	20545	99.96
1	53	2	5	0.02	20550	99.98
1	55	1	1	0.00	20551	99.99

age65p	STRATUM	SECU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	55	2	1	0.00	20552	99.99
1	56	2	2	0.01	20554	100.00

Note: problem with Bad Strata: program aborts, PSU: Read data Only one cluster for stratum 27 Only one cluster for stratum 53 Only one cluster for stratum 56. May consider stratum collapse but not shown here.