SAS Analysis Examples Replication C5

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* SAS Analysis Examples Replication for ASDA 2nd Edition, SAS v9.4 TS1M3 ;
* Berglund April 2017
* Chapter 5 ;

libname d "P:\ASDA 2\Data sets\nhanes 2011_2012\" ;
ods listing ;
ods graphics off ;
options nodate nonumber ;

ods rtf style=minimal bodytitle ;
data c5_nhanes ;
  set d.nhanes1112_sub_8aug2016 ;
 int_wtmec2yr = int(wtmec2yr) ;
 female=0 ;
 if riagendr=2 then female = 1 ;
 if age > 45 then age45=1 ; else age45=0 ;
run ;

title "Example 5.1 : generate weighted histogram of cholesterol"  ;
proc sgplot ;
 where age18p=1 ;
 histogram lbxtc / weight = wtmec2yr ;
run ;

title "Example 5.2:generate weighted boxplot of cholesterol by gender" ;
proc sgplot ;
 where age18p=1 ;
 vbox lbxtc / category=female weight=wtmec2yr ;
run;

title "Example 5.3 : Population totals using NCSR data " ;
libname ncsr "P:\ASDA 2\Data sets\ncsr\" ;

data c5_ncsr ;
 set ncsr.ncsr_sub_13nov2015 ;
 * create variables needed for NCSR examples ;
 ncsrwtsh_pop = ncsrwtsh * (209128094 / 9282) ;
run ;
proc surveymeans sum stderr clsum ;
 strata sestrat ; cluster seclustr ; weight ncsrwtsh_pop ;
 var mde ;
run ;
proc surveymeans sum stderr clsum ;
 domain mar3cat ;
 strata sestrat ; cluster seclustr ; weight ncsrwtsh_pop ;
 var mde ;
run ;

title "Example 5.4 : Total HH Wealth using HRS 2012 data " ;
libname hrs "P:\ASDA 2\Data sets\HRS 2012\" ;

data c5_hrs ;
 set hrs.hrs_sub_28sep2016 ;
 if nfinr=1 then finr=1 ; else if nfinr=0 then finr=0 ; else finr=. ;
 if gender=2 then female=1 ; else female=0 ;
 if nage >=70 then age70=1 ; else age70=0 ;
run ;
proc surveymeans all ;
 strata secu ; cluster stratum ; weight nwgthh ;
 var h11atota ;
```

```
 where finr=1 ;
run ;

title "Example 5.5: Estimating the Mean Value of Household Income using the 2012 HRS Data." ;
proc surveymeans all ;
 strata secu ; cluster stratum ; weight nwgthh ;
 var h11itot ;
 where finr=1 ;
run ;

title "Example 5.6: Estimating Mean Systolic Blood Pressure using the NHANES Data." ;
proc surveymeans data=c5_nhanes ;
 strata sdmvstra ; cluster sdmvpsu ; weight wtmec2yr ;
 var bpxsy1 ;
 domain age18p ;
run ;

title "Example 5.7: Estimating the Mean Value of Total Household Wealth using the HRS Data." ;
proc surveymeans data=c5_hrs ;
 strata secu ; cluster stratum ; weight nwgthh ;
 var h11atota ;
 where finr=1 ;
run ;

title "Example 5.8: Estimation of the Population Standard Deviations of NHANES 2011-2012 Measures
of High-density and Total Cholesterol Level.";
proc means data=c5_nhanes mean std vardef=wdf ;
 weight wtmec2yr ;
 where age18p=1 ;
 var lbdhdd lbxtc ;
run ;

title "Example 5.9: Estimating Population Quantiles for Total Household Wealth Using the HRS Data."
;
proc surveymeans data=c5_hrs varmethod=jk  percentile=(25 50 75) ;
 strata stratum ; cluster secu ; weight nwgthh ;
 domain finr ;
 var h11atota ;
run ;

ods text="Example 5.10: Estimating the Lorenz Curve and Gini Coefficient for the 2012 HRS Population
Distribution of Total Household Wealth. Not available in SAS SURVEY procedures" ;

title "Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol
Measures in the 2011-2012 NHANES.";
proc means data=c5_nhanes mean ;
 where age18p=1 ;
 var lbdhdd lbxtc ;
 weight wtmec2yr ;
run ;
proc corr data=c5_nhanes ;
 where age18p=1 ;
 var lbdhdd lbxtc ;
 weight wtmec2yr ;
run ;

data c5_nhanes_1 ;
 set c5_nhanes ;
 stdlbxtc=(lbxtc - 194.4355)/41.05184 ;
 stdlbdhdd = (lbdhdd - 52.83826) / 14.93157 ;
run ;
```

```
proc surveyreg data=c5_nhanes_1 ;
 strata sdmvstra ; cluster  sdmvpsu ; weight wtmec2yr ;
 domain age18p;
 model stdlbdhdd = stdlbxtc ;
run ;

title "Example 5.12: Estimating the Population Ratio of High Density to Total Cholesterol for U.S.
Adults. ";
proc surveymeans data=c5_nhanes ;
 strata sdmvstra ; cluster  sdmvpsu ; weight wtmec2yr ;
 domain age18p;
 ratio lbdhdd/lbxtc ;
run ;

title "Example 5.13: Estimating the Proportions of Males and Females Age >= 70 with Diabetes Using
the HRS Data." ;
proc surveymeans data=c5_hrs ;
 strata stratum ; cluster secu ; weight nwgtr ;
 domain age70 * gender ;
 var diabetes ;
run ;

title "Example 5.14: Estimating Mean Systolic Blood Pressure for Males and Females Age > 45 using
the 2011-2012 NHANES data.";
proc surveymeans data=c5_nhanes ;
 strata sdmvstra ; cluster  sdmvpsu ; weight wtmec2yr ;
 domain age45*riagendr ;
 var bpxsy1 ;
run ;

title "Example 5.15: Estimating Differences in Mean Total Household Wealth Between HRS Subpopulations
Defined by Educational Attainment Level."  ;
proc surveymeans data=c5_hrs ;
 strata stratum ; cluster secu ; weight nwgthh ;
 domain finr * edcat ;
 var h11atota ;
run ;

proc surveyreg data=c5_hrs ;
 strata stratum ; cluster secu ; weight nwgthh ;
 domain finr ;
 class edcat ;
 model h11atota=edcat / solution ;
 lsmeans edcat / diff ;
run ;

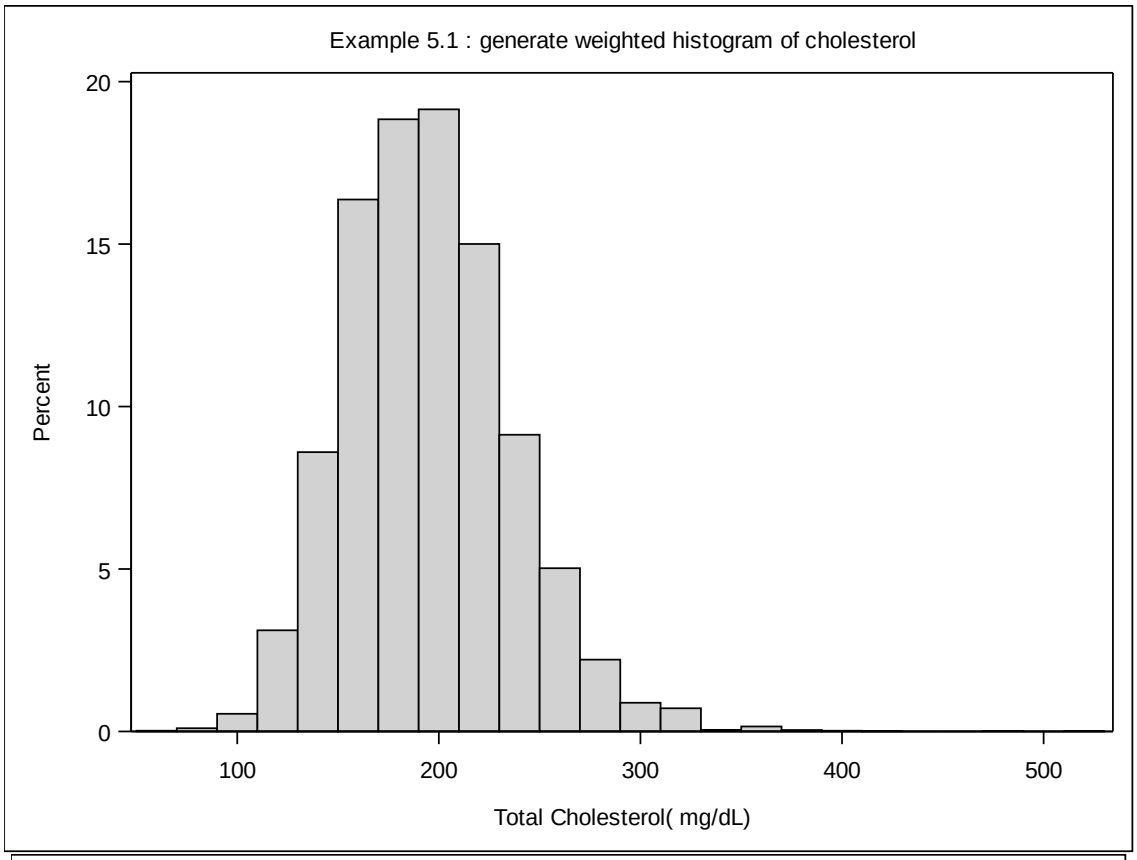
title "Example 5.16: Estimating Differences in Mean Total Household Wealth from 2010 to 2012 using
Data from the HRS study. " ;
libname hrs10_12 "P:\ASDA 2\Data sets\HRS 2012\hrs 2010" ;
data hrs_2010_2012_c5 ;
 set hrs10_12.hrs_2010_2012_both ;
 * prepare data for analysis ;
 hhweight = mwgthh ;  if year=2012 then hhweight = nwgthh ;
 totwealth=h10atota ; if year=2012 then totwealth=h11atota ;
 finr2010 = 0 ;  if (year = 2010 & mfinr = 1) then finr2010=1 ;
 finr2012 = 0 ;  if (year = 2012 & nfinr = 1) then finr2012=1 ;
 finr2010_2012 = 0 ; if finr2010 = 1 | finr2012 = 1 then finr2010_2012=1 ;
run ;

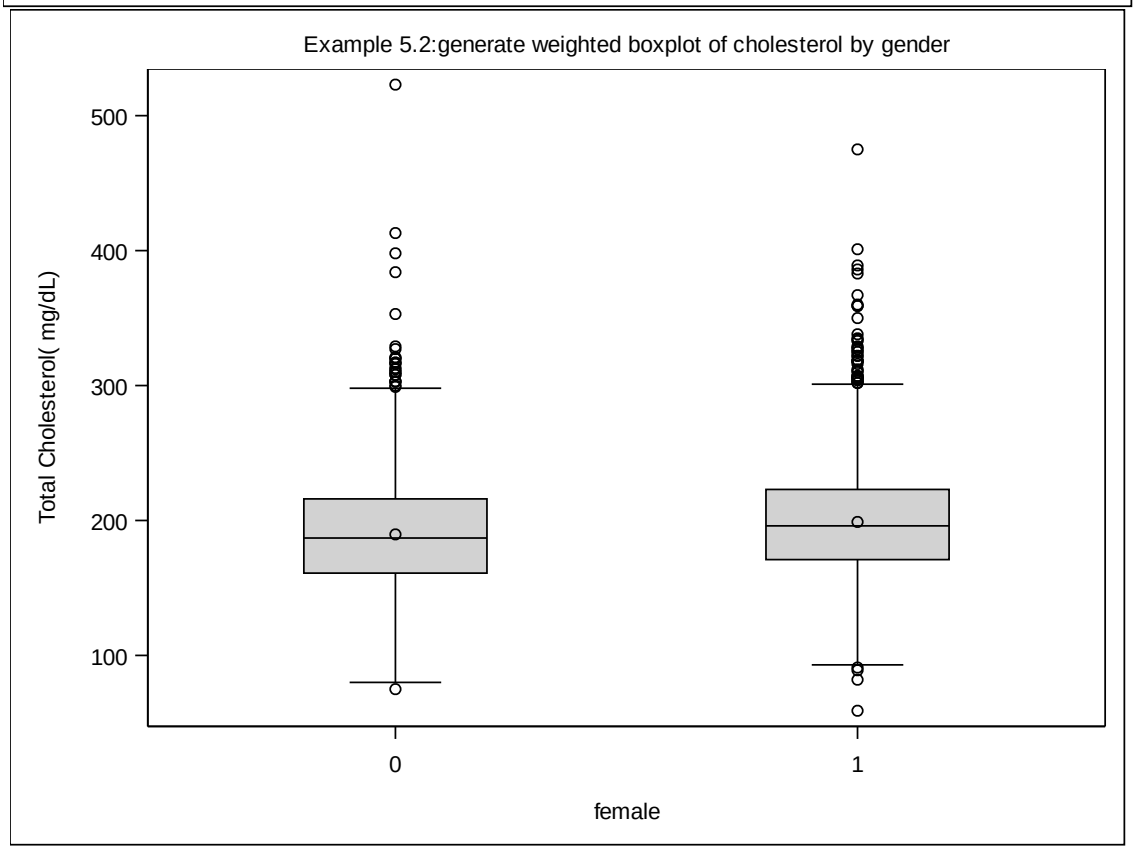
proc surveyreg data=hrs_2010_2012_c5 ;
 strata stratum ; cluster secu ; weight hhweight ;
 domain finr2010_2012 ;
```

```
 class year ;
 model totwealth=year / solution ;
 lsmeans year / diff ;
run ;

ods rtf close ;
```

Output


Example 5.1 : generate weighted histogram of cholesterol
Percent
0
5
10
15
20
100
200
300
400
500
Total Cholesterol(mg/dL)


Example 5.2:generate weighted boxplot of cholesterol by gender
Total Cholesterol(mg/dL)
100
200
300
400
500
0
1
female

Example 5.3 : Population totals using NCSR data

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	42
Number of Clusters	84
Number of Observations	9282
Sum of Weights	209128097

Statistics						
Variable	Label	Std Error of Mean	Sum	Std Error of Sum	95% CL for Sum	
mde	Major Depressive Episode 1=Yes 0=No	0.004877	40092207	2567488	34910806.0	45273607.0

Example 5.3 : Population totals using NCSR data

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	42
Number of Clusters	84
Number of Observations	9282
Sum of Weights	209128097

Statistics						
Variable	Label	Std Error of Mean	Sum	Std Error of Sum	95% CL for Sum	
mde	Major Depressive Episode 1=Yes 0=No	0.004877	40092207	2567488	34910806.0	45273607.0

Example 5.3 : Population totals using NCSR data

The SURVEYMEANS Procedure

Domain Statistics in MAR3CAT							
Marital Status 1=Married 2=Previously Married 3=Never Married	Variable	Label	Std Error of Mean	Sum	Std Error of Sum	95% CL for Sum	
1	mde	Major Depressive Episode 1=Yes 0=No	0.006415	20304191	1584109	17107329.8	23501051.2
2	mde	Major Depressive Episode 1=Yes 0=No	0.010533	10360671	702622	8942723.0	11778618.3
3	mde	Major Depressive Episode 1=Yes 0=No	0.010247	9427345	773138	7867090.6	10987600.2

Example 5.4 : Total HH Wealth using HRS 2012 data

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	2
Number of Clusters	112
Number of Observations	14191
Number of Observations Used	13657
Number of Obs with Nonpositive Weights	534
Sum of Weights	58969863

Statistics

Variable	Label	N	N Miss	Minimum	Maximum	Range	Clusters	Sum of Weights	DF	Mean	Std Error of Mean	Var of Mean
H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	13657	0	-1510000	29748000	31258000	112	58969863	110	428471	18367	337347647

Statistics

Variable	t Value	Pr > |t|	95% CL for Mean		Lower 95% One-Sided CL for Mean	Upper 95% One-Sided CL for Mean	Coeff of Variation	Sum	Std Error of Sum
H11ATOTA	23.33	<.0001	392071.621	464869.890	398003	458938	0.042866	2.5266862E13	1.7154555E12

Statistics

Variable	Var of Sum	95% CL for Sum		Lower 95% One-Sided CL for Sum	Upper 95% One-Sided CL for Sum	Coeff of Variation for Sum
H11ATOTA	2.9427875E24	2.18672E13	2.86665E13	2.2421223E13	2.8112501E13	0.067893

Quantiles

Variable	Label	Percentile		Estimate	Std Error	95% Confidence Limits	
H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	0%	Min	-1510000	.	.	.
	H11ATOTA:W11 Total of all Assets--Cross-wave	10%	D1	-24.278656	245.070299	-509.950	461.39
	H11ATOTA:W11 Total of all Assets--Cross-wave	20%	D2	8943.267582	1530.727914	5909.724	11976.81
	H11ATOTA:W11 Total of all Assets--Cross-wave	25%	Q1	21953	2733.354219	16536.594	27370.33
	H11ATOTA:W11 Total of all Assets--Cross-wave	30%	D3	40001	3512.739696	33039.810	46962.66
	H11ATOTA:W11 Total of all Assets--Cross-wave	40%	D4	83400	5237.092350	73021.390	93778.77
	H11ATOTA:W11 Total of all Assets--Cross-wave	50%	Median	141907	9189.419106	123695.282	160117.83
	H11ATOTA:W11 Total of all Assets--Cross-wave	60%	D6	223767	12216	199556.712	247976.49
	H11ATOTA:W11 Total of all Assets--Cross-wave	70%	D7	345526	18776	308316.963	382734.56
	H11ATOTA:W11 Total of all Assets--Cross-wave	75%	Q3	439965	20824	398697.591	481232.81
	H11ATOTA:W11 Total of all Assets--Cross-wave	80%	D8	547396	24305	499229.032	595562.68
	H11ATOTA:W11 Total of all Assets--Cross-wave	90%	D9	1018845	49816	920121.766	1117567.96
	H11ATOTA:W11 Total of all Assets--Cross-wave	100%	Max	29748000	.	.	.

Example 5.5: Estimating the Mean Value of Household Income using the 2012 HRS Data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	2
Number of Clusters	112
Number of Observations	14191
Number of Observations Used	13657
Number of Obs with Nonpositive Weights	534
Sum of Weights	58969863

Statistics												
Variable	Label	N	N Miss	Minimum	Maximum	Range	Clusters	Sum of Weights	DF	Mean	Std Error of Mean	Var of Mean
H11ITOT	H11ITOT:W11 Incm: Total HHold / R+Sp only	13657	0	0	3666240	3666240	112	58969863	110	71382	2272.517174	5164334

Statistics									
Variable	t Value	Pr > |t|	95% CL for Mean		Lower 95% One-Sided CL for Mean	Upper 95% One-Sided CL for Mean	Coeff of Variation	Sum	Std Error of Sum
H11ITOT	31.41	<.0001	66878.8082	75885.9995	67613	75152	0.031836	4.2094106E12	256779341179

Statistics						
Variable	Var of Sum	95% CL for Sum		Lower 95% One-Sided CL for Sum	Upper 95% One-Sided CL for Sum	Coeff of Variation for Sum
H11ITOT	6.593563E22	3.70053E12	4.71829E12	3.7834588E12	4.6353624E12	0.061001

Quantiles							
Variable	Label	Percentile		Estimate	Std Error	95% Confidence Limits	
H11ITOT	H11ITOT:W11 Incm: Total HHold / R+Sp only	0%	Min	0	.	.	.
	H11ITOT:W11 Incm: Total HHold / R+Sp only	10%	D1	9635.570320	320.258945	9000.892	10270.248
	H11ITOT:W11 Incm: Total HHold / R+Sp only	20%	D2	14962	365.521885	14237.262	15686.019
	H11ITOT:W11 Incm: Total HHold / R+Sp only	25%	Q1	17899	446.424220	17014.660	18784.076
	H11ITOT:W11 Incm: Total HHold / R+Sp only	30%	D3	20979	618.466415	19752.897	22204.208
	H11ITOT:W11 Incm: Total HHold / R+Sp only	40%	D4	28951	777.173049	27411.055	30491.404
	H11ITOT:W11 Incm: Total HHold / R+Sp only	50%	Median	38604	1229.742145	36167.247	41041.367
	H11ITOT:W11 Incm: Total HHold / R+Sp only	60%	D6	51613	1500.495192	48639.173	54586.431
	H11ITOT:W11 Incm: Total HHold / R+Sp only	70%	D7	69644	1961.121046	65757.789	73530.752
	H11ITOT:W11 Incm: Total HHold / R+Sp only	75%	Q3	80991	2622.038737	75794.625	86187.156
	H11ITOT:W11 Incm: Total HHold / R+Sp only	80%	D8	98510	3082.560797	92401.027	104618.851
	H11ITOT:W11 Incm: Total HHold / R+Sp only	90%	D9	155669	6132.432234	143515.742	167821.824
	H11ITOT:W11 Incm: Total HHold / R+Sp only	100%	Max	3666240	.	.	.

Example 5.6: Estimating Mean Systolic Blood Pressure using the NHANES Data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	14
Number of Clusters	31
Number of Observations	9756
Number of Observations Used	9338
Number of Obs with Nonpositive Weights	418
Sum of Weights	306590681

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	6756	119.530464	0.546864	118.376682	120.684245

Example 5.6: Estimating Mean Systolic Blood Pressure using the NHANES Data.

The SURVEYMEANS Procedure

Domain Statistics in age18p							
Age >=18: 1=Yes 0=No	Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
0	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	1624	105.848426	0.285412	105.246260	106.450592
1	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	5132	122.029235	0.616339	120.728874	123.329597

Example 5.7: Estimating the Mean Value of Total Household Wealth using the HRS Data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	2
Number of Clusters	112
Number of Observations	14191
Number of Observations Used	13657
Number of Obs with Nonpositive Weights	534
Sum of Weights	58969863

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	13657	428471	18367	392071.621	464869.890

Example 5.8: Estimation of the Population Standard Deviations of NHANES 2011-2012 Measures of High-density and Total Cholesterol Level.

The MEANS Procedure

Variable	Label	Mean	Std Dev
LBDHDD	Direct HDL-Cholesterol (mg/dL)	52.8382631	14.9301339
LBXTC	Total Cholesterol(mg/dL)	194.4354654	41.0478781

Example 5.9: Estimating Population Quantiles for Total Household Wealth Using the HRS Data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	56
Number of Clusters	112
Number of Observations	20554
Number of Observations Used	19990
Number of Obs with Nonpositive Weights	564
Sum of Weights	89174512

Variance Estimation	
Method	Jackknife
Number of Replicates	112

Quantiles							
Variable	Label	Percentile		Estimate	Std Error	95% Confidence Limits	
H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	25%	Q1	34927	3319.521194	28277.301	41576.901
	H11ATOTA:W11 Total of all Assets--Cross-wave	50%	Median	171881	9644.778831	152559.716	191201.343
	H11ATOTA:W11 Total of all Assets--Cross-wave	75%	Q3	495103	18863	457314.587	532890.660

Example 5.9: Estimating Population Quantiles for Total Household Wealth Using the HRS Data.

The SURVEYMEANS Procedure

Domain Quantiles in finr								
finr	Variable	Label	Percentile		Estimate	Std Error	95% Confidence Limits	
1	H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	25%	Q1	21953	2495.966129	16953.439	26953.481
		H11ATOTA:W11 Total of all Assets--Cross-wave	50%	Median	141907	8352.753750	125173.978	158639.130
		H11ATOTA:W11 Total of all Assets--Cross-wave	75%	Q3	439965	21286	397324.839	482605.562

Example 5.10: Estimating the Lorenz Curve and Gini Coefficient for the 2012 HRS Population Distribution of Total Household Wealth. Not available in SAS SURVEY procedures

Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol Measures in the 2011-2012 NHANES.

The MEANS Procedure

Variable	Label	Mean
LBDHDD	Direct HDL-Cholesterol (mg/dL)	52.8382631
LBXTC	Total Cholesterol(mg/dL)	194.4354654

Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol Measures in the 2011-2012 NHANES.

The CORR Procedure

2 Variables:	LBDHDD LBXTC
Weight Variable:	WTMEC2YR

Simple Statistics							
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
LBDHDD	5187	52.83826	3066	1.15527E10	14.00000	175.00000	Direct HDL-Cholesterol (mg/dL)
LBXTC	5187	194.43547	8428	4.25118E10	59.00000	523.00000	Total Cholesterol(mg/dL)

Pearson Correlation Coefficients, N = 5187 Prob > |r| under H0: Rho=0		
	LBDHDD	LBXTC
LBDHDD Direct HDL-Cholesterol (mg/dL)	1.00000	0.24144 <.0001
LBXTC Total Cholesterol(mg/dL)	0.24144 <.0001	1.00000

Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol Measures in the 2011-2012 NHANES.

The SURVEYREG Procedure

Regression Analysis for Dependent Variable stdlbdhdd

Data Summary	
Number of Observations	6988
Sum of Weights	260814685
Weighted Mean of stdlbdhdd	-0.0044356
Weighted Sum of stdlbdhdd	-1156879.7

Design Summary	
Number of Strata	14
Number of Clusters	31

Fit Statistics	
R-Square	0.05355
Root MSE	0.9396
Denominator DF	17

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	228.82	<.0001
Intercept	1	0.73	0.4040
stdlbxtc	1	228.82	<.0001

The denominator degrees of freedom for the F tests is 17.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.02742474	0.03204797	0.86	0.4040
stdlbxtc	0.22147079	0.01464098	15.13	<.0001

The degrees of freedom for the t tests is 17.

Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol Measures in the 2011-2012 NHANES.

The SURVEYREG Procedure

Age >=18: 1=Yes 0=No=0

Domain Regression Analysis for Variable stdlbdhdd

Domain Summary	
Number of Observations	6988
Number of Observations in Domain	1801
Number of Observations Not in Domain	5187
Sum of Weights in Domain	42172649
Weighted Mean of stdlbdhdd	-0.02743
Weighted Sum of stdlbdhdd	-1156924.9

Fit Statistics	
R-Square	0.05729
Root MSE	0.7419
Denominator DF	17

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	26.72	<.0001
Intercept	1	10.86	0.0043
stdlbxtc	1	26.72	<.0001

The denominator degrees of freedom for the F tests is 17.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.21496136	0.06523494	3.30	0.0043
stdlbxtc	0.27245142	0.05271004	5.17	<.0001

The degrees of freedom for the t tests is 17.

Example 5.11: Estimation of the Correlation of Adults' Total and High-Density Cholesterol Measures in the 2011-2012 NHANES.

The SURVEYREG Procedure

Age >=18: 1=Yes 0=No=1

Domain Regression Analysis for Variable stdlbdhdd

Domain Summary	
Number of Observations	6988
Number of Observations in Domain	5187
Number of Observations Not in Domain	1801
Sum of Weights in Domain	218642036
Weighted Mean of stdlbdhdd	2.06593E-7
Weighted Sum of stdlbdhdd	45.16990

Fit Statistics	
R-Square	0.05829
Root MSE	0.9705
Denominator DF	17

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	288.54	<.0001
Intercept	1	0.00	1.0000
stdlbxtc	1	288.54	<.0001

The denominator degrees of freedom for the F tests is 17.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.00000041	0.03410036	0.00	1.0000
stdlbxtc	0.24144356	0.01421387	16.99	<.0001

The degrees of freedom for the t tests is 17.

Example 5.12: Estimating the Population Ratio of High Density to Total Cholesterol for U.S. Adults.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	14
Number of Clusters	31
Number of Observations	9756
Number of Observations Used	9338
Number of Obs with Nonpositive Weights	418
Sum of Weights	306590681

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
LBXTC	Total Cholesterol(mg/dL)	6988	188.529858	1.036759	186.342488	190.717227
LBDHDD	Direct HDL-Cholesterol (mg/dL)	6989	52.771964	0.470567	51.779153	53.764775

Example 5.12: Estimating the Population Ratio of High Density to Total Cholesterol for U.S. Adults.

The SURVEYMEANS Procedure

Domain Statistics in age18p							
Age >=18: 1=Yes 0=No	Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
0	LBXTC	Total Cholesterol(mg/dL)	1801	157.912524	1.148055	155.490340	160.334708
	LBDHDD	Direct HDL-Cholesterol (mg/dL)	1802	52.428317	0.443091	51.493476	53.363159
1	LBXTC	Total Cholesterol(mg/dL)	5187	194.435465	1.019552	192.284400	196.586531
	LBDHDD	Direct HDL-Cholesterol (mg/dL)	5187	52.838263	0.506560	51.769515	53.907011

Ratio Analysis						
Numerator	Denominator	N	Ratio	Std Err	95% CL for Ratio	
LBDHDD	LBXTC	6988	0.279913	0.002630	0.27436402	0.28546273

Example 5.12: Estimating the Population Ratio of High Density to Total Cholesterol for U.S. Adults.

The SURVEYMEANS Procedure

Domain Ratio in age18p							
Age >=18: 1=Yes 0=No	Numerator	Denominator	N	Ratio	Std Err	95% CL for Ratio	
0	LBDHDD	LBXTC	1801	0.332011	0.002775	0.32615540	0.33786592
1	LBDHDD	LBXTC	5187	0.271752	0.002894	0.26564611	0.27785827

Example 5.13: Estimating the Proportions of Males and Females Age >= 70 with Diabetes Using the HRS Data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	56
Number of Clusters	112
Number of Observations	20554
Number of Observations Used	18851
Number of Obs with Nonpositive Weights	1703
Sum of Weights	90698760

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
diabetes	1=Yes Diabetes 0=No Diabetes	18838	0.215159	0.004414	0.20631766	0.22400109

Example 5.13: Estimating the Proportions of Males and Females Age >= 70 with Diabetes Using the HRS Data.

The SURVEYMEANS Procedure

Domain Statistics in age70*GENDER								
age70	Gender 1=Male 2=Female	Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
0	1	diabetes	1=Yes Diabetes 0=No Diabetes	4590	0.209950	0.006980	0.19596704	0.22393217
	2	diabetes	1=Yes Diabetes 0=No Diabetes	6115	0.192096	0.006220	0.17963621	0.20455522
1	1	diabetes	1=Yes Diabetes 0=No Diabetes	3494	0.273611	0.007468	0.25865017	0.28857234
	2	diabetes	1=Yes Diabetes 0=No Diabetes	4639	0.226974	0.008555	0.20983745	0.24411115

Example 5.14: Estimating Mean Systolic Blood Pressure for Males and Females Age > 45 using the 2011-2012 NHANES data.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	14
Number of Clusters	31
Number of Observations	9756
Number of Observations Used	9338
Number of Obs with Nonpositive Weights	418
Sum of Weights	306590681

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	6756	119.530464	0.546864	118.376682	120.684245

Example 5.14: Estimating Mean Systolic Blood Pressure for Males and Females Age > 45 using the 2011-2012 NHANES data.

The SURVEYMEANS Procedure

Domain Statistics in age45*RIAGENDR								
age45	Gender	Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
0	1	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	2078	115.913072	0.455049	114.953003	116.873141
	2	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	2006	109.791492	0.491917	108.753638	110.829346
1	1	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	1329	128.300550	0.868705	126.467741	130.133358
	2	BPXSY1	Systolic: Blood pres (1st rdg) mm Hg	1343	128.181974	0.946016	126.186054	130.177894

Example 5.15: Estimating Differences in Mean Total Household Wealth Between HRS Subpopulations Defined by Educational Attainment Level.

The SURVEYMEANS Procedure

Data Summary	
Number of Strata	56
Number of Clusters	112
Number of Observations	20554
Number of Observations Used	19990
Number of Obs with Nonpositive Weights	564
Sum of Weights	89174512

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	19990	474129	19681	434703.583	513554.052

Example 5.15: Estimating Differences in Mean Total Household Wealth Between HRS Subpopulations Defined by Educational Attainment Level.

The SURVEYMEANS Procedure

Domain Statistics in finr*edcat								
finr	Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
1	1	H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	2870	122089	10596	100863.103	143314.177
	2	H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	4222	259027	9802.470020	239390.454	278663.868
	3	H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	3265	336309	17202	301849.303	370767.939
	4	H11ATOTA	H11ATOTA:W11 Total of all Assets--Cross-wave	3232	834141	46478	741034.791	927247.195

Example 5.15: Estimating Differences in Mean Total Household Wealth Between HRS Subpopulations Defined by Educational Attainment Level.

The SURVEYREG Procedure

Regression Analysis for Dependent Variable H11ATOTA

Data Summary	
Number of Observations	13589
Sum of Weights	58685309
Weighted Mean of H11ATOTA	429464.8
Weighted Sum of H11ATOTA	2.52033E13

Design Summary	
Number of Strata	56
Number of Clusters	112

Fit Statistics	
R-Square	0.05975
Root MSE	1082011
Denominator DF	56

Class Level Information			
CLASS Variable	Label	Levels	Values
edcat	Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	4	1 2 3 4

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	3	99.77	<.0001
Intercept	1	753.81	<.0001
edcat	3	99.77	<.0001

The denominator degrees of freedom for the F tests is 56.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	834140.99	46482.9218	17.95	<.0001
edcat 1	-712052.35	48891.4538	-14.56	<.0001
edcat 2	-575113.83	47094.7482	-12.21	<.0001
edcat 3	-497832.37	46282.5555	-10.76	<.0001
edcat 4	0.00	0.0000	.	.

The degrees of freedom for the t tests is 56.
Matrix X'WX is singular and a generalized inverse was used to solve the normal equations. Estimates are not unique.

edcat Least Squares Means					
Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Estimate	Standard Error	DF	t Value	Pr > |t|
1	122089	10597	56	11.52	<.0001
2	259027	9803.55	56	26.42	<.0001
3	336309	17204	56	19.55	<.0001
4	834141	46483	56	17.95	<.0001

Differences of edcat Least Squares Means						
Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Estimate	Standard Error	DF	t Value	Pr > |t|
1	2	-136939	12527	56	-10.93	<.0001
1	3	-214220	17184	56	-12.47	<.0001
1	4	-712052	48891	56	-14.56	<.0001
2	3	-77281	16247	56	-4.76	<.0001
2	4	-575114	47095	56	-12.21	<.0001
3	4	-497832	46283	56	-10.76	<.0001

Example 5.15: Estimating Differences in Mean Total Household Wealth Between HRS Subpopulations Defined by Educational Attainment Level.

The SURVEYREG Procedure

finr=1

Domain Regression Analysis for Variable H11ATOTA

Domain Summary	
Number of Observations	13589
Number of Observations in Domain	13589
Number of Observations Not in Domain	0
Sum of Weights in Domain	58685309
Weighted Mean of H11ATOTA	429464.8
Weighted Sum of H11ATOTA	2.52033E13

Fit Statistics	
R-Square	0.05975
Root MSE	1082011
Denominator DF	56

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	3	99.77	<.0001
Intercept	1	753.81	<.0001
edcat	3	99.77	<.0001

The denominator degrees of freedom for the F tests is 56.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	834140.99	46482.9218	17.95	<.0001
edcat 1	-712052.35	48891.4538	-14.56	<.0001
edcat 2	-575113.83	47094.7482	-12.21	<.0001
edcat 3	-497832.37	46282.5555	-10.76	<.0001
edcat 4	0.00	0.0000	.	.

The degrees of freedom for the t tests is 56.
Matrix X'WX is singular and a generalized inverse was used to solve the normal equations. Estimates are not unique.

edcat Least Squares Means					
Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Estimate	Standard Error	DF	t Value	Pr > |t|

edcat Least Squares Means					
Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Estimate	Standard Error	DF	t Value	Pr > |t|
1	122089	10597	56	11.52	<.0001
2	259027	9803.55	56	26.42	<.0001
3	336309	17204	56	19.55	<.0001
4	834141	46483	56	17.95	<.0001

Differences of edcat Least Squares Means						
Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Education 1=0-11 Yrs 2=12 Yrs 3=13-15 Yrs 4=16+ Yrs	Estimate	Standard Error	DF	t Value	Pr > |t|
1	2	-136939	12527	56	-10.93	<.0001
1	3	-214220	17184	56	-12.47	<.0001
1	4	-712052	48891	56	-14.56	<.0001
2	3	-77281	16247	56	-4.76	<.0001
2	4	-575114	47095	56	-12.21	<.0001
3	4	-497832	46283	56	-10.76	<.0001

Example 5.16: Estimating Differences in Mean Total Household Wealth from 2010 to 2012 using Data from the HRS study.

The SURVEYREG Procedure

Regression Analysis for Dependent Variable totwealth

Data Summary	
Number of Observations	37291
Sum of Weights	164299555
Weighted Mean of totwealth	479078.0
Weighted Sum of totwealth	7.87123E13

Design Summary	
Number of Strata	56
Number of Clusters	112

Fit Statistics	
R-Square	0.000013
Root MSE	1125104
Denominator DF	56

Class Level Information		
CLASS Variable	Levels	Values
year	2	2010 2012

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	0.71	0.4027
Intercept	1	718.42	<.0001
year	1	0.71	0.4027

The denominator degrees of freedom for the F tests is 56.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	483042.939	19048.5453	25.36	<.0001
year 2010	-7970.060	9451.6127	-0.84	0.4027
year 2012	0.000	0.0000	.	.

The degrees of freedom for the t tests is 56.
Matrix X'WX is singular and a generalized inverse was used to solve the normal equations. Estimates are not unique.

year Least Squares Means					
year	Estimate	Standard Error	DF	t Value	Pr > |t|

year Least Squares Means					
year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	475073	17908	56	26.53	<.0001
2012	483043	19049	56	25.36	<.0001

Differences of year Least Squares Means						
year	_year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	2012	-7970.06	9451.61	56	-0.84	0.4027

Example 5.16: Estimating Differences in Mean Total Household Wealth from 2010 to 2012 using Data from the HRS study.

The SURVEYREG Procedure

finr2010_2012=0

Domain Regression Analysis for Variable totwealth

Domain Summary	
Number of Observations	37291
Number of Observations in Domain	12109
Number of Observations Not in Domain	25182
Sum of Weights in Domain	57021932
Weighted Mean of totwealth	561362.6
Weighted Sum of totwealth	3.201E13

Fit Statistics	
R-Square	0.000045
Root MSE	1148621
Denominator DF	56

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	1.29	0.2616
Intercept	1	544.04	<.0001
year	1	1.29	0.2616

The denominator degrees of freedom for the F tests is 56.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	569090.113	25821.3345	22.04	<.0001
year 2010	-15421.085	13599.5262	-1.13	0.2616
year 2012	0.000	0.0000	.	.

The degrees of freedom for the t tests is 56.
Matrix X'WX is singular and a generalized inverse was used to solve the normal equations. Estimates are not unique.

year Least Squares Means					
year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	553669	24172	56	22.91	<.0001
2012	569090	25821	56	22.04	<.0001

Differences of year Least Squares Means						
year	_year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	2012	-15421	13600	56	-1.13	0.2616

Example 5.16: Estimating Differences in Mean Total Household Wealth from 2010 to 2012 using Data from the HRS study.

The SURVEYREG Procedure

finr2010_2012=1

Domain Regression Analysis for Variable totwealth

Domain Summary	
Number of Observations	37291
Number of Observations in Domain	25182
Number of Observations Not in Domain	12109
Sum of Weights in Domain	107277623
Weighted Mean of totwealth	435340.7
Weighted Sum of totwealth	4.67023E13

Fit Statistics	
R-Square	5.029E-6
Root MSE	1109915
Denominator DF	56

Tests of Model Effects			
Effect	Num DF	F Value	Pr > F
Model	1	0.39	0.5331
Intercept	1	736.78	<.0001
year	1	0.39	0.5331

The denominator degrees of freedom for the F tests is 56.

Estimated Regression Coefficients				
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	437807.631	17016.5224	25.73	<.0001
year 2010	-4978.066	7936.9039	-0.63	0.5331
year 2012	0.000	0.0000	.	.

The degrees of freedom for the t tests is 56.
Matrix X'WX is singular and a generalized inverse was used to solve the normal equations. Estimates are not unique.

year Least Squares Means					
year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	432830	16011	56	27.03	<.0001
2012	437808	17017	56	25.73	<.0001

Differences of year Least Squares Means						
year	_year	Estimate	Standard Error	DF	t Value	Pr > |t|

Differences of year Least Squares Means						
year	_year	Estimate	Standard Error	DF	t Value	Pr > |t|
2010	2012	-4978.07	7936.90	56	-0.63	0.5331