What's New in SUDAAN 11?

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SUDAAN 11

- SUDAAN 11 is 50% bigger than SUDAAN 10
- Enhancements and additions came from user feedback and requests
- Mathematical details of new enhancements and additions are provided in SUDAAN 11 Manual
- Additional information at RTI International JSM Booth

SUDAAN 11: What's New

Three New Procedures

- Descriptive Statistics
- Weighting
- Imputation

Numerous Enhancements to Established Procedures

- **`CROSSTAB`**
- **`WTADJUST`** and other Weight Adjustment procedures
- Modeling Procedures

New Statements for Every Procedure

New Procedure: VARGEN

- New descriptive procedure
- Provides precision estimates for functions of estimates For example:
  - Ratio of ratios
  - Difference of variable means
- Provides between subgroup contrast estimates and SE's
- Provides new descriptive statistics and their SE's. For example:
  - Pearson correlation
  - Population variance and standard deviation

New Procedure: **WTADJX**

- Pre-analysis procedure
- Produces weight adjustments
  - Nonresponse adjustments
  - Post-stratification or calibration adjustments
- Similar to SUDAAN's **WTADJUST** procedure except...
  - Model explanatory variables and calibration variables are not required to be the same
- Model explanatory variables are required to be known for respondents only
  - Allows researchers to assess the potential for bias in estimates when nonrespondents are not missing at random.

New Procedure: **IMPUTE**

- Pre-analysis procedure
- "Replaces" SUDAAN's **HOTDECK** procedure
- Four imputation methods available
  - Weighted sequential hot deck
  - Cell mean
  - Linear regression
  - Logistic regression
- Descriptive statistics available
  - Pre/Post-imputation statistics
  - Imputation class statistics

Enhancement: CROSSTAB

Breslow-Day Test (BDTEST)

- Test for homogeneity of odds ratios in stratified 2x2 tables

```
TABLES AGEGRP4*SEX_REC*HAC1A;
BDTEST / all;
```

Prevalence Ratio, Odds Ratio, and Breslow-Day Test Measuring Association Between Gender and Arthritis

Test Statistics for Breslow-Day Hypothesis
Variable SEX_REC by Variable HAC1A
Controlling for: Variable AGEGRP4

by: Hypothesis Test, Test Statistic.

Hypothesis Test Test Statistic	DF	Adj DF	Test Value	P-Value
Breslow-Day: Homogeneity of Odds Ratios				
Wald chi-square	3	.	6.93	0.0742
Wald-F	3	.	2.31	0.0879
Adj Wald F	3	.	2.22	0.0987
Satterthwaite-adj chi-sq	3	2.55	6.15	0.0747
Satterthwaite-adj F	3	2.55	2.42	0.0869

NHANES-III, 1988-1994, JULY 1997 DATA RELEASE, ADULTS (17+)

Enhancement: CROSSTAB

Cohen's K Coefficient (AGREE)

- Kappa measure of inter-rater agreement
- Includes design-based SEs of kappa

```
AGREE   hssex*depumpc1s*derumpc1s;
```

Intra-Examiner Agreement Baseline vs. Follow-up Periodontal Assessments of Teeth

Kappa Agreement Statistics
Variable DEPUMPC1S by Variable DERUMPC1S

by: Sex.

Sex	Kappa	SE	Lower 95% Limit	Upper 95% Limit
Total	0.4864	0.0336	0.4189	0.5539
Male	0.4772	0.0620	0.3527	0.6017
Female	0.4896	0.0516	0.3860	0.5932

Data Source: NHANES III, 1988-1994

Enhancement: WTADJUST

Additional summary descriptive statistics

- Sum of original weights over respondents
- Sum of trimmed weights over respondents
- Sum of final weights over respondents
- Printed control totals
- Difference between control totals and final weight sums

Enhancement: Logistic and Weight Adjustment Procedures

- **`LOGISTIC`**, **`WTADJUST`**, **`WTADJX`**
- Provides descriptive statistics for response propensity and weight adjustment. Includes SE's
  - Mean
  - Population variance
  - Population and relative standard deviations
- Weighted response rates and SE's
- Representativity indicator (or R-Indicator) and its SE
- Subgroup estimates, contrasts estimates and contrast SE's available for all these statistics

Enhancement: Logistic and Weight Adjustment Procedures (cont.)

- Provide descriptive statistics and SE's using adjusted weight
  - Means, Totals, Ratios, Percents, Contrasts Between Groups
- All standard error estimates properly account for weight adjustment
  - This is an important and distinguishing feature
  - Standard errors can be increased or reduced due to a weight adjustment (e.g. due to unequal weighting, calibration). Standard error estimates are more likely to reflect this now
- Additional design effects
  - For example, variance estimate that properly accounts for weight adjustment compared to variance estimate that ignores adjustment

Enhancement: Modeling Procedures

All modeling procedures:

- Confidence intervals for predicted and conditional marginals

All modeling procedures except `REGRESS`:

- Estimate odds ratios, incidence density ratios, hazards ratios with any Multiple-Unit change in continuous covariate

Enhancement: Iterative Procedures

- **`LOGISTIC`**, **`MULTILOG`**, **`LOGLINK`**, **`SURVIVAL`**, **`WTADJUST`**, **`WTADJX`**
- Betas can be printed for EACH iteration
- Useful for isolating variables that cause model parameter iteration process (Newton-Raphson algorithms) to not converge
  - Due to linear dependences
  - Due to explanatory variables that define subgroups with no variability in the dependent variable.

New Statements

NEWVAR

- Create new variables “on-the-fly” in current procedure
- IF-THEN-ELSE logic available

BY|RBY

- By-group processing (similar to **BY** statement in SAS)
- Data does NOT need to be sorted by **BY** variables
- SUDAAN treats each by group as a sub population (similar to **SUBPOPN**)

New Statements (cont.)

SUBPOPX

- More user friendly version of **SUBPOPN**
- Cascading relational operators
  - `SUBPOPX 18 <= AGE <= 65;`
- IN syntax
  - `SUBPOPX RACE IN (1,2);`
- Arithmetic operators
  - `SUBPOPX HEIGHT < MEANHT * 1.50;`
- Word-representative operators allowed
  - **NOT, EQ, LT, LE, GT, GE**
- Missing dot "." allowed
  - `SUBPOPX XVAR NE .;`

For More Information

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