sts generate — Create variables containing survivor and related functions

Syntax

```
sts generate newvar =
   { s | se(s) | h | se(lls) | lb(s) | ub(s) | na | se(na) | lb(na) | ub(na) | n | d }
   [ newvar = { ... } ... ] [ if ] [ in ] [ , options ]
```

options Description

Options

by( varlist ) calculate separately for each group formed by varlist
adjustfor( varlist ) adjust the estimates to zero values of varlist
strata( varlist ) stratify on different groups of varlist
level(#) set confidence level; default is level(95)

You must stset your data before using sts generate; see [ST] stset.

Menu

Statistics > Survival analysis > Summary statistics, tests, and tables > Create survivor, hazard, and other variables

Description

sts generate creates new variables containing the estimated survivor (failure) function, the Nelson–Aalen cumulative hazard (integrated hazard) function, and related functions. See [ST] st for an introduction to this command.

sts generate can be used with single- or multiple-record or single- or multiple-failure st data.

Functions

**Main**

`s` produces the Kaplan–Meier product-limit estimate of the survivor function, \( \hat{S}(t) \), or, if `adjustfor()` is specified, the baseline survivor function from a Cox regression model on the `adjustfor()` variables.

`se(s)` produces the Greenwood, pointwise standard error, \( \hat{se}\{\hat{S}(t)\} \). This option may not be used with `adjustfor()`.
h produces the estimated hazard component, \( \Delta H_j = H(t_j) - H(t_{j-1}) \), where \( t_j \) is the current failure time and \( t_{j-1} \) is the previous one. This is mainly a utility function used to calculate the estimated cumulative hazard, \( H(t_j) \), yet you can estimate the hazard via a kernel smooth of the \( \Delta H_j \); see \([ST] \) \texttt{sts graph}. It is recorded at all the points at which a failure occurs and is computed as \( d_j/n_j \), where \( d_j \) is the number of failures occurring at time \( t_j \) and \( n_j \) is the number at risk at \( t_j \) before the occurrence of the failures.

\( \text{se(lls)} \) produces \( \hat{\sigma}(t) \), the standard error of \( -\ln \hat{S}(t) \). This option may not be used with \texttt{adjustfor()}.

\( \text{lb(s)} \) produces the lower bound of the confidence interval for \( \hat{S}(t) \) based on \( -\ln \hat{S}(t) \):
\[
\hat{S}(t) \exp(-z_{\alpha/2} \hat{\sigma}(t)),
\]
where \( z_{\alpha/2} \) is the \( (1 - \alpha/2) \) quantile of the standard normal distribution. This option may not be used with \texttt{adjustfor()}.

\( \text{ub(s)} \) produces the upper bound of the confidence interval for \( \hat{S}(t) \) based on \( -\ln \hat{S}(t) \):
\[
\hat{S}(t) \exp(z_{\alpha/2} \hat{\sigma}(t)),
\]
where \( z_{\alpha/2} \) is the \( (1 - \alpha/2) \) quantile of the standard normal distribution. This option may not be used with \texttt{adjustfor()}.

\( \text{na} \) produces the Nelson–Aalen estimate of the cumulative hazard function. This option may not be used with \texttt{adjustfor()}.

\( \text{se(na)} \) produces pointwise standard error for the Nelson–Aalen estimate of the cumulative hazard function, \( \hat{H}(t) \). This option may not be used with \texttt{adjustfor()}.

\( \text{lb(na)} \) produces the lower bound of the confidence interval for \( \hat{H}(t) \) based on the log-transformed cumulative hazard function. This option may not be used with \texttt{adjustfor()}.

\( \text{ub(na)} \) produces the corresponding upper bound. This option may not be used with \texttt{adjustfor()}.

\( \text{n} \) produces \( n_j \), the number at risk just before time \( t_j \). This option may not be used with \texttt{adjustfor()}.

\( \text{d} \) produces \( d_j \), the number failing at time \( t_j \). This option may not be used with \texttt{adjustfor()}.

**Options**

- \( \text{by(varlist)} \) performs a separate calculation for each by-group. By-groups are identified by equal values of the variables in \texttt{varlist}. \texttt{by()} may not be combined with \texttt{strata()}.

- \( \text{adjustfor(varlist)} \) adjusts the estimate of the survivor (failure) or hazard function to that for 0 values of \texttt{varlist}. This option is available only with functions \texttt{s} or \texttt{h}. See \([ST] \) \texttt{sts graph} for an example of how to adjust for values different from 0.

  If you specify \texttt{adjustfor()} with \texttt{by()}, \texttt{sts} fits separate Cox regression models for each group, using the \texttt{adjustfor()} variables as covariates. The separately calculated baseline survivor functions are then retrieved.

  If you specify \texttt{adjustfor()} with \texttt{strata()}, \texttt{sts} fits a stratified-on-group Cox regression model using the \texttt{adjustfor()} variables as covariates. The stratified, baseline survivor function is then retrieved.

- \( \text{strata(varlist)} \) requests estimates of the survivor (failure) or hazard functions stratified on variables in \texttt{varlist}. It requires specifying \texttt{adjustfor()} and may not be combined with \texttt{by()}.

- \( \text{level(#)} \) specifies the confidence level, as a percentage, for the \texttt{lb(s)}, \texttt{ub(s)}, \texttt{lb(na)}, and \texttt{ub(na)} functions. The default is \texttt{level(95)} or as set by \texttt{set level}; see \([U] \) 20.7 Specifying the width of confidence intervals.
Remarks and examples

\texttt{sts generate} is a seldom-used command that gives you access to the calculations listed by \texttt{sts list} and graphed by \texttt{sts graph}.

Use of this command is demonstrated in \texttt{[ST] sts}.

Methods and formulas

See \texttt{[ST] sts}.

References

See \texttt{[ST] sts} for references.

Also see

\texttt{[ST] sts} — Generate, graph, list, and test the survivor and cumulative hazard functions
\texttt{[ST] sts graph} — Graph the survivor, hazard, or cumulative hazard function
\texttt{[ST] sts list} — List the survivor or cumulative hazard function
\texttt{[ST] sts test} — Test equality of survivor functions
\texttt{[ST] stset} — Declare data to be survival-time data