stata

Interval-censorded Cox model

- Genuine semiparametric modeling
- Left-censoring, right-censoring, interval-censoring
- Current-status and general interval-censored data
- Single- or multiple-record data
- Multiple events New
- Stratified estimation
- Time-varying covariates
- Two estimators for baseline hazard
- Robust and cluster-robust standard errors
- Graphs of survivor, cumulative hazard, and hazard functions
- Residual diagnostics
- Graphical checks of proportional-hazards assumption
- Graphical checks of goodness of fit
- Powerful test for a common covariate effect across all events New

Do you know the exact failure times or event times?

You can fit the Cox proportional hazards model in Stata even if you don't.

Fit the model

The Cox proportional hazards model is widely used with right-censored event-time data because it does not require parameterization of the baseline hazard function and, under the proportional-hazards assumption, the hazard ratios are constant over time.

If we know the exact failure times, we can fit a Cox proportional hazards model using the **stcox** command. For instance, we can type

. stcox age_mean i.inject

to study the effect of mean age and injection status on failure times.

It is just as easy to fit a Cox proportional hazards model with interval-censored data, where we know only that the failure occurred sometime between two time points. With single-record-per-subject data, we specify the variables containing the upper and lower endpoints for the failure time in **stintcox**'s **interval()** option.

. stintcox age_mean i.inject, interval(ltime rtime)

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 stintcox age note: using ac 	e _mean i.inje daptive step s	c t, interval size to comp	(ltime r ute deriv	time) vatives.			
Performing EM	optimization	(showing ev	ery 100 :	iterations	s):		
Iteration 0:	Log likeliho	d = -1086.3	2564				
Iteration 200	: Log likeliho	bod = -601.6	1522				
Iteration 200	: Log likeliho	$rac{1}{1} = -601.5$	3336				
Computing star	ndard errors:		doi	ne			
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Lower endpo	int: ltime			1	Interval-cen	s. =	92
Upper endpo:	int: rtime						
				Wald	d chi2(2)	=	11.18
Log likelihoo	d = -601.53336	5		Prot	o > chi2	=	0.0037
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age_mean							
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And in the presence of multiple events, we can use the new **stmgintcox** command to account for possible correlations between event times across the different events by additionally specifying the subject **id** and **event** variables:

. stmgintcox age_mean i.inject, id(id) event(event) interval(ltime rtime)



Graph the results

Use **stcurve** to plot the survivor, hazard, or cumulative hazard function.

. stcurve, survival at(inject = (0 1))



Check the proportional-hazards assumption

We can assess the proportional-hazards assumption graphically using the **stintphplot** command.

. stintphplot, interval(ltime rtime) by(inject)
 adjustfor(age_mean)



Or we can test this assumption when fitting the model. Specify the **tvc()** option to interact covariates with time, and test for coefficients of time-interacted covariates equal to zero.

. stintcox age_mean i.inject, interval(ltime rtime)
 tvc(age_mean i.inject)

Predict baseline survivor function

For each individual, we can predict the baseline survivor functions corresponding to the lower and upper endpoints of our interval.

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	32.327869	•	-10.461744	Yes	.8936399	0
ľ	40.360657		-5.4617438	No	.8740674	0
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	24.065575		7.5382562	Yes	.896766	0
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Type or point and click

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