CHECK LIST for survival analysis
2018-02-19 Anna Johansson, MEB

1. Think in advance (before starting the analysis)
   - When is start/end of follow-up
   - What/when is the event
   - What/when are censoring events
   - What timescales are important
     - Time-varying rates
     - Confounding by time
     - Effect modification by time
     - Is any timescale part of research question (do you want to estimate effects over time)
   - What other confounders/mediators/effect modifiers should be included?
     - Are all covariates fixed, or are some time-varying exposures?

2. Data preparations
   - Define and code the outcome (event) variable (include censoring)
   - Define and code start of follow-up
   - Define and code end of follow-up (include censoring)
   - Code event indicator and risktime (in Stata: **stset**)
   - Define and code all covariates
   - Any time-varying exposures (need to split and allow the time-varying exposures)

3. Descriptive analysis
   - Estimate and plot survival curves (not for delayed entry data) (**sts graph**)
   - Estimate and plot hazard rates (**sts graph, haz**)
   - Estimate crude hazard rates (**strate**) - how many events are in each exposure category, this will limit the modelling power and subgrouping/interactions in analysis
     - How does the rate vary over time? By exposure groups? By confounders?
     - Is the proportional hazard assumption valid for all exposures/confounders?
   - Check where the events occur over time (**hist _t if _d==1**)

4. Modelling
   - Choose a model (see slides on Poisson vs Cox);
     - Poisson: If interest in rates and HRs, multiple timescales, interactions with time (non-proportional hazards)
     - Cox: If interest in HRs, no interest in main timescale (but strong adjustment is important), one main timescale (no multiple timescales), proportional hazards/non-proportional hazards (different HRs over time in timebands)
   - Run models stepwise adding covariates and confounders according to your research questions
     - Test for significant effects using Wald or LR tests
     - Include interactions between fixed exposures
     - Test proportional hazards assumption; account for non-proportional hazards by including interactions with timescale