Survival time

Survival time

- In survival analysis, we are interested in "time-to-event" data.
- Need to specify
  - Time scale: a unit at which time is measured.
  - Time origin: when does the clock start ticking?

Time scale

- The choice of time scale depends on the nature of the study and the targeted length of the study period.
- Finer time scale for a rapid process with shorter study period and coarser time scale for a gradual process with longer study period.
- Example: In studies of surgical treatment on lung cancer, survival status can change rapidly. For such a study, a day or week is the appropriate time scale.
- Example: In studies of prostate cancer, survival status change more slowly and patients are followed longer period. In this case, a month can be an appropriate time scale.

Time origin

- More difficult to specify.
- Some examples of time origin
  - Entry of study/start of treatment
  - Diagnosis of a disease
  - Birth
  - Last occurrence of the same type of event
- Northern bobwhite example
  - Entry of study or Birth?

Time origin

- How to choose appropriate time origin?
- Here are some rationales for choosing time origin.
- R1: Choose a time origin that marks the onset of continuous exposure to risk of the event.
- Examples: if event of interest is
  - Divorce, time origin: date of marriage.
  - Death to radiation exposure, time origin: time of first exposure.

Time origin

- R2: In experimental studies, choose the time of randomization to treatments as the time origin.
- Example: In a study to compare the effects of different kinds of marital counseling on likelihood of divorce, the appropriate time origin would be time of first counseling; not marriage.

Example

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- Choice of time origin
  - Time of diagnosis of disease
  - Time of surgery
  - Time of birth

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