Chapter 1 Notes:

Survival analysis: stat procedures for data analysis when outcome is time (or age) until an event occurs

More than one event becomes either a recurrent event or a competing risk problem

Event: the occurrence of death, relapse, recidivism, etc.

Outcome: the time (years, months, days, etc) until the event occurs

Censoring: have info about individual survival time, but don’t know it exactly

Why censor: study ends with no event, lost to follow-up, withdrawals

Failed: the event of interest occurred

Censored: see above

Fail/Censor notation (1 fail, 0 Censor)

**Question is the notation for fail/censor standardized?**

Right censored: true survival time is equal to or greater than observed survival time

Can be left censored, but it is uncommon

Random Variable T = Survival time (T >= 0 )

t = specific value for T

random variable d = (0, 1): 1 = failure, 0 = censored

Survivor function S(t): probability that a person survives longer than some specified time t: Probability that T > t

**What is the hazard function (in practical terms, I understand it mathematically)?**

JK. Hazard function gives the instantaneous potential per unit time for the event to occur, given that the individual has survived to time t.

Survivor function focuses on *not* failing, while the hazard function focuses on failing (event occurrence)

Hazard function is sometimes called a “conditional failure rate”

Note: hazard function returns a “rate” not a probability. It is the rate per unit of time.

h(t) >= 0

h(t) has no upper bound

When a hazard function is constand, the survival model is said to be “exponential”

**Why is that?**

Types of hazard functions:

Exponential: constant instantaneous potential

Increasing Weibull: instantaneous potential increases as time increases

Decreasing Weibull: instantaneous potential decreases as time increases

Lognormal: instantaneous potential increases and then decreases as time increases

Data formats:

Tabular format:

Individual, t (time of failure), d, explanatory variables

Counting process: for more complicated survival analysis (future chapters)

**Is there a preferable data format?**

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