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Critical Appraisal: Survival Time Data

Survival time: Time elapsed until end-point event.

End-point denoted with ◆

Censored (unobtainable) data denoted with +

Censored survival time: Time elapsed until subject censored.

End-point probability (pE) = 1 - pS
Survival probability (pS) = 1 - pE

Kaplan-Meier method: Estimates cumulative survival probability.

Median survival time (MST): Time elapsed until pS = 0.5 or 50%

Log-rank test: Statistical (Chi2) test to calculate a p-value for differences in pE / pS / MST
If $p < 0.05$, is significant = reject null hypothesis

Hazard (h): Instantaneous probability an individual will have an end-point event at a given time (t).
Hazard at (t) = pE (t) / pS (t)

If t = day 180, pE = 0.3 and pS = 0.7 at day 180
Hazard (t = 180) = 0.3 / 0.7 = 0.43
Hence probability of a subject meeting end-point on day 180 = 0.43

Hazard ratio (HR): Relative risk of an instantaneous end-point in one group (i.e. drug N) compared with another group (i.e. drug S).

If t = day 180, hN = 0.43, hS = 2.33
HR = 0.43 / 2.33 = 0.2
Hence subjects on drug N are 5 times less likely to die than those on drug S at day 180.