Short course on Response-Adaptive Methods for Clinical Trials

November 29, 2025

Notation sheet:

- Index for patient is i

- Index for arm is k

- Number of patients on arm k as a random variable (RV) is N_k

- Fixed number of patients in a trial n

- Maximal number of patients in a trial n_{max}

- Notation for the potential outcome is Y_{ki}

- The parameter of interest of Y_{ki} is binary: p_k

- The estimator $\hat{p}_k$ is the MLE of p_k.

- The treatment effect of interest is θ, when Y_{ki} is binary: $\theta = p_k - p_0$

- The variable a_{ki} is a binary indicator and equal to 1 if patient i is assigned to treatment k and 0 otherwise.

- The vector a_k indicates whether each patient i in n patients got assigned to treatment k

- The vector a_i indicates whether each treatment k got assigned to patient i or not

- The vector $a_k^{(i)}$ lists the binary indicators or treatment assignments up to patient i. Similar Notation is used for outcomes $Y^{(i)}$, $X^{(i)}$ for covariate(s) and proportions $\rho^{(i)}$.

- $\mathsf{E}(.)$ denotes expectation

- $\mathbb{1}_C$ is an indicator function taking value 1 iff condition C holds

- Notation $<<$ and $>>$ means much smaller or much larger than

- Notation for the limiting assignment proportion in a multi-armed trial $\rho = (\rho_0, \rho_1 ..., \rho_K)$.

- But notation for the assignment proportion to the experimental arm for two armed trials in Lectures 2 and 3 is ρ

- Notation for the randomisation probability in a multi-armed trial $p^* = (p_0^*, p_1^* ..., p_K^*)$.

- Statistical power and type I error rate of a statistical test $T(.)$ is denoted as $1 - \beta$ and α respectively

- BRAR denotes the original untuned Thompson sampling algorithm.

- (Lecture 3) Notation for the lower stopping boundary for a group sequential trial is l

- (Lecture 3) Notation for the upper stopping boundary for a group sequential trial is u

  Notice that notation l,u in Lecture 3 not necessarily in $(0, 1)$ as in Lecture 1

- Notation x_k in Lecture 4 denotes number of successes observed in treatment arm k