

# Short course on Response-Adaptive Methods for Clinical Trials

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## 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  $\theta$ , 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  $Y^{(i)}$  and proportions  $\rho^{(i)}$ .
- $E(.)$  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  $\rho = (\rho_0, \rho_1, \dots, \rho_K)$ .

- But notation for the assignment proportion to the experimental arm for two armed trials in Lectures 2 and 3 is  $\rho$
- Notation for the randomisation probability in a multi-armed trial  $p^* = (p_0^*, p_1^*, \dots, p_K^*)$ .
- Statistical power and type I error rate of a statistical test  $T(\cdot)$  is denoted as  $1 - \beta$  and  $\alpha$  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  $k$