Table 1: Two-treatment comparison

General result	H_0	H_A	level α	power $1-\beta$
T_n	$T_n \sim N(0,1)$	$T_n \sim N\left(\phi(n,\Delta_A,\theta),\sigma_*^2\right)$	1-sided: $T_n \geq z_\alpha$	$\phi(n,\Delta_A,\theta) = Z_\alpha + Z_\beta\sigma_*$
			2-sided: $\lvert T_n\rvert \geq z_{\alpha/2}$	$\phi(n,\Delta_A,\theta) = Z_{\alpha/2} + Z_\beta\sigma_*$

Superiority trials		
Continuous outcome	$H_0: \mu_1 = \mu_2$	$H_A: \mu_j = \mu_{jA}, j = 1,2$
$T_n = \frac{\bar{Y}_1 - \bar{Y}_2}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$	$T_n \sim N(0,1)$	$T_n \sim N\left(\frac{\mu_{1A}-\mu_{2A}}{\sigma\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}, 1\right)$
Binary outcome	$H_0: \pi_1 = \pi_2$	$H_A: \pi_j = \pi_{jA}, j = 1,2$
$T_1 = \frac{p_1-p_2}{\sqrt{\bar{p}(1-\bar{p})(\frac{1}{n_1}+\frac{1}{n_2})}}$	$T_1 \sim N(0,1)$	$T_1 \sim N\left(\frac{\pi_{1A}-\pi_{2A}}{\left\{\bar{\pi}(1-\bar{\pi})(\frac{1}{n_1}+\frac{1}{n_2})\right\}^{1/2}}, \frac{\pi_1(1-\pi_1)+\pi_2(1-\pi_2)}{2\bar{\pi}(1-\bar{\pi})}\right)$
$\bar{p} = \frac{X_1+X_2}{n_1+n_2}$		$\bar{\pi} = \frac{\pi_1+\pi_2}{2}$
$T_2 = \frac{p_1-p_2}{\sqrt{\frac{p_1(1-p_1)}{n_1}+\frac{p_2(1-p_2)}{n_2}}}$	$T_2 \sim N(0,1)$	$T_2 \sim N\left(\frac{\pi_{1A}-\pi_{2A}}{\left\{\frac{\pi_1(1-\pi_1)}{n_1}+\frac{\pi_2(1-\pi_2)}{n_2}\right\}^{1/2}}, 1\right)$
$T_3 = \frac{\sin^{-1}(p_1^{1/2})-\sin^{-1}(p_2^{1/2})}{\left(\frac{1}{4n_1}+\frac{1}{4n_2}\right)^{1/2}}$	$T_3 \sim N(0,1)$	$T_3 \sim N\left(\frac{\sin^{-1}(\pi_{1A}^{1/2})-\sin^{-1}(\pi_{2A}^{1/2})}{\left(\frac{1}{4n_1}+\frac{1}{4n_2}\right)^{1/2}}, 1\right)$
Survival outcome	$H_0: \lambda_1(t) = \lambda_0(t)$	$H_A: \frac{\lambda_1(t)}{\lambda_0(t)} = \exp(\gamma_A)$
$T_n = \frac{\sum_{\text{all death times } u}\left\{d_1(u)-\frac{n_1(u)}{n(u)}d(u)\right\}}{\left[\sum_{\text{all death times } u}\frac{n_1(u)n_0(u)d(u)\{n(u)-d(u)\}}{n^2(u)\{n(u)-1\}}\right]^{1/2}}$	$T_n \sim N(0,1)$	$T_n \sim N\left(\{d\theta(1-\theta)\}^{1/2}\gamma_A, 1\right)$
Non-inferiority trials		
Continuous outcome	$H_0: \mu_1 \leq \mu_2 - \Delta_A$	$H_A: \mu_1 = \mu_2, j = 1,2$
$T_n = \frac{\bar{Y}_1-\bar{Y}_2+\Delta_A}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$	$T_n \sim N(0,1)$	$T_n \sim N\left(\frac{\Delta_A}{\sigma\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}, 1\right)$
Binary outcome	$H_0: \pi_1 \leq \pi_2 - \Delta_A$	$H_A: \pi_1 = \pi_2, j = 1,2$
$T_n = \frac{p_1-p_2+\Delta_A}{\sqrt{\frac{p_1(1-p_1)}{n_1}+\frac{p_2(1-p_2)}{n_2}}}$	$T_n \sim N(0,1)$	$T_n \sim N\left(\frac{\Delta_A}{\sqrt{\frac{\pi_1(1-\pi_1)}{n_1}+\frac{\pi_2(1-\pi_2)}{n_2}}}, 1\right)$

Table 2: K-treatment comparison

General result	H_0	H_A	level α	power $1-\beta$
T_n	$T_n \sim \chi^2_{K-1}$	$T_n \sim \chi^2_{K-1,\phi^2(n,\Delta_A,\theta)}$	$T_n \geq \chi^2_{K-1,\alpha}$	$\phi(n,\Delta_A,\theta)=\phi(\alpha,\beta,K-1)$

Continuous outcome	$H_0: \mu_1 = \cdots = \mu_K$	$H_A: \mu_j = \mu_{jA}$ $j = 1, \cdots, K$	H_A : any two diff by $\geq \Delta_A$
$T_n = \frac{\sum_{j=1}^K n_j(\bar{Y}_j - \bar{\bar{Y}})^2}{s_Y^2}$	$T_n \sim \chi^2_{K-1}$	$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi^2_{K-1,\phi^2}$
$\bar{\bar{Y}} = \frac{\sum_{j=1}^K n_j \bar{Y}_j}{n}$		$\phi^2 = \frac{\sum_{j=1}^K n_j(\mu_{jA} - \bar{\mu}_A)^2}{\sigma_Y^2}$	$\phi^2 = \frac{n\Delta_A^2}{2K\sigma_Y^2}$ (equal allocation)
$s_Y^2 = \frac{\sum_{j=1}^K \sum_{i=1}^{n_j}(Y_{ij} - \bar{Y}_j)^2)}{n-K}$		$\bar{\mu}_A = \frac{\sum_{j=1}^K n_j \mu_{jA}}{n}$	
Binary outcome	$H_0: \sin^{-1}\sqrt{\pi_1} =$ $\cdots = \sin^{-1}\sqrt{\pi_K}$	$H_A: \sin^{-1}\sqrt{\pi_j} = \sin^{-1}\sqrt{\pi_{jA}}$, $j = 1, \cdots, K$	H_A : any two diff by $\geq \Delta_A$
$T_n = \sum_{i=1}^K 4n_i(\sin^{-1}\sqrt{p_i} - \hat{A}_p)^2$	$T_n \sim \chi^2_{K-1}$	$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi^2_{K-1,\phi^2}$
$\hat{A}_p = \frac{\sum_{i=1}^K 4n_i \sin^{-1}\sqrt{p_i}}{\sum_{i=1}^K 4n_i} = \frac{\sum_{i=1}^K n_i \sin^{-1}\sqrt{p_i}}{\sum_{i=1}^K n_i}$		$\phi^2 = \sum_{i=1}^K 4n_i(\sin^{-1}\sqrt{\pi_{iA}} - \bar{A}_{\pi A})^2$	$\phi^2 = \frac{2n\Delta_A^2}{K}$ (equal allocation)
		$\bar{A}_{\pi A} = \frac{\sum_{i=1}^K n_i \sin^{-1}\sqrt{\pi_{iA}}}{\sum_{i=1}^K n_i}$	
Survival outcome	$H_0: \lambda_0(t) = \ldots = \lambda_K(t)$	$H_A: \lambda_1(t) = \lambda_{1A}, \ldots, \lambda_K(t) = \lambda_{KA}$	H_A : any hazard ratio $\geq \exp(\gamma_A)$
$T_n = \tilde{T}_n^T \tilde{V}_n^{-1} \tilde{T}_n$ (see notes)	$T_n \sim \chi^2_{K-1}$	$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi^2_{K-1,\phi^2}$
		$\phi^2 = d\sum_{j=1}^K \theta_j \left\{\log(\lambda_{jA}) - \sum_{j=1}^K \theta_j \log(\lambda_{jA})\right\}^2$	$\phi^2 = \frac{d}{K}\frac{\gamma_A^2}{2}$ (equal allocation)