Table 1: Two-treatment comparison

General result H_0 $T_n \sim N(0,1)$ $T_n \sim$	$T_n \sim N\left(\phi(n, \Delta_A, \theta), \sigma_*^2\right)$	level α 1-sided: $T_n \ge z_{\alpha}$ 2-sided: $ T_n \ge z_{\alpha/2}$	$\phi(n, \Delta_A, \theta) = Z_{\alpha} + Z_{\beta}\sigma_* \ \phi(n, \Delta_A, \theta) = Z_{\alpha/2} + Z_{\beta}\sigma_*$
Continuous outcome	Superiority trials $H_0: \mu_1 = \mu_2$		$H_A:\mu_j=\mu_{jA}, j=1,2$
$T_n = rac{ar{Y}_1 - ar{Y}_2}{s_p \sqrt{rac{1}{n_1} + rac{1}{n_2}}}$	$T_n \sim N(0,1)$	$T_n \sim$	$T_n \sim N\left(rac{\mu_{1A}-\mu_{2A}}{\sigma\sqrt{rac{1}{n_1}+rac{1}{n_2}}},1 ight)$
Binary outcome	$H_0: \pi_1 = \pi_2$	H_A :	$H_A:\pi_j=\pi_{jA}, j=1,2$
$T_1 = \frac{p_1 - p_2}{\sqrt{\bar{p}(1 - \bar{p})(\frac{1}{n_1} + \frac{1}{n_2})}}$ $\bar{p} = \frac{X_1 + X_2}{n_1 + n_2}$	$T_1 \sim N(0,1)$	$T_1 \sim N \left(rac{\pi_1}{\left\{\pi(1-ar{\pi}) ight.} ight.$	$\frac{\pi_{1}A - \pi_{2}A}{\left\{\pi(1-\bar{\pi})(\frac{1}{n_{1}} + \frac{1}{n_{2}})\right\}^{1/2}}, \frac{\pi_{1}(1-\pi_{1}) + \pi_{2}(1-\pi_{2})}{\frac{2\bar{\pi}(1-\bar{\pi})}{\bar{\pi}}}$
$T_2 = \frac{p_1 - p_2}{\sqrt{\frac{p_1(1 - p_1)}{n_1} + \frac{p_2(1 - p_2)}{n_2}}}$	$T_2 \sim N(0,1)$	$T_2 \sim N \left(rac{1}{2} ight)$	$\left\{rac{\pi_{1A}-\pi_{2A}}{n_1}, 1 ight\} \\ \left\{rac{\pi_{1}(1-\pi_{1})}{n_1} + rac{\pi_{2}(1-\pi_{2})}{n_2} ight\}^{1/2}, 1 ight\}$
$T_3 = \frac{\sin^{-1}(p_1^{1/2}) - \sin^{-1}(p_2^{1/2})}{\left(\frac{1}{4n_1} + \frac{1}{4n_2}\right)^{1/2}}$	$T_3 \sim N(0,1)$	$T_3 \sim N \left(rac{\epsilon}{3} ight)$	$\frac{\sin^{-1}(\pi_{1A}^{1/2}) - \sin^{-1}(\pi_{2A}^{1/2})}{\left(\frac{1}{4n_1} + \frac{1}{4n_2}\right)^{1/2}}, 1$
Survival outcome	$H_0: \lambda_1(t) = \lambda_0(t)$	H_A	$H_A: \frac{\lambda_1(t)}{\lambda_0(t)} = \exp(\gamma_A)$
$T_n = \frac{\sum_{\text{all death times } u} \left\{ d_1(u) - \frac{n_1(u)}{n(u)} d(u) \right\}}{\left[\sum_{\text{all death times } u} \frac{n_1(u) n_0(u) d(u) \{n(u) - d(u)\}}{n^2(u) \{n(u) - 1\}} \right]^{1/2}}$		$T_n \sim N$	$T_n \sim N\left(\left\{d\theta(1-\theta)\right\}^{1/2} \gamma_A, 1\right)$
	Non-inferiority trials	rials	
Continuous outcome	$H_0: \mu_1 \leq \mu_2 - \Delta_A$	H_A	$H_A:\mu_1=\mu_2,j=1,rac{2}{3}$
$T_n = rac{ar{Y}_1 - ar{Y}_2 + \Delta_A}{s_P \sqrt{rac{1}{n_1} + rac{1}{n_2}}}$	$T_n \sim N(0,1)$	$T_n \sim N$	$N\left(rac{\Delta_A}{\sigma\sqrt{rac{1}{n_1+rac{1}{n_2}}}},1 ight)$
Rinary outcome	$H_0: \pi_1 \leq \pi_2 = \bigwedge_A$	H_{λ}	$H_{\lambda} \cdot \pi_1 = \pi_2 i = 1 2$

 $\frac{\pi_1(1-\pi_1)}{\pi_2} + \frac{\pi_2(1-\pi_2)}{\pi_2}$

 $T_n \sim N$

 $H_A: \pi_1 = \pi_2, j = 1, 2$

 $H_0: \pi_1 \le \pi_2 - \Delta_A$

Binary outcome

 $T_n \sim N(0,1)$

 $/\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}$ $p_1-p_2+\Delta_A$

 $T_n = -$

Table 2: K-treatment comparison

General result $E_n \sim T_n$	H_0 H_A $T_n \sim \chi_{K-1,\phi^2(n,\Delta_A,\theta)}^2$	level α power $1-\beta$ g_{β} $T_n \ge \chi^2_{K-1,\alpha}$ $\phi(n,\Delta_A,\theta) = \phi(\alpha,\beta,K-1)$	
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 $\geq \Delta_A$
$T_n = rac{\sum_{j=1}^K n_j (ar{Y}_j - ar{ar{Y}})^2}{s_{\mathbf{X}}^2}$	$T_n \sim \chi_{K-1}^2$	$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi^2_{K-1,\phi^2}$
$ar{ar{Y}} = rac{ar{ar{Y}}}{\sum_{j=1}^K n_j ar{Y}_j}$		$\phi^2 = \frac{\sum_{j=1}^K n_j (\mu_{jA} - \bar{\mu}_A)^2}{\sigma_V^2}$	$\phi^2 = \frac{n\Delta_A^2}{2K\sigma_V^2}$ (equal allocation)
$s_{Y}^{2} = rac{\sum_{j=1}^{K} \sum_{i=1}^{n_{j}} (Y_{ij} - ar{Y}_{j})^{2})}{n - K}$		$ar{\mu}_A = rac{\sum_{j=1}^K \prod_{nj} \mu_j A_j}{n}$	· ·
Binary outcome	$H_0 : \sin^{-1} \sqrt{\pi_1} = \cdots = \sin^{-1} \sqrt{\pi_V}$	$H_A : \sin^{-1} \sqrt{\pi_j} = \sin^{-1} \sqrt{\pi_{jA}},$ $i = 1 \cdots K$	H_A : any two diff by $\geq \Delta_A$
$T_n = \sum_{i=1}^K 4n_i (\sin^{-1} \sqrt{p_i} - \hat{A}_p)^2$		$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi^2_{K-1,\phi^2}$
$\hat{A}_p = \frac{\sum_{i=1}^{K} 4n_i \sin^{-1} \sqrt{p_i}}{\sum_{i=1}^{K} 4n_i} = \frac{\sum_{i=1}^{K} n_i \sin^{-1} \sqrt{p_i}}{\sum_{i=1}^{K} 4n_i}$]°a	$\phi^2 = \sum_{i=1}^K 4n_i (\sin^{-1} \sqrt{\pi_{iA}} - \bar{A}_{\pi A})^2$	$\phi^2 = \frac{2n\Delta_A^2}{K}$ (equal allocation)
		$ar{A}_{\pi A} = rac{\sum_{i=1}^K n_i \sin^{-1} \sqrt{\pi_i A}}{\sum_{i=1}^K n_i}$	
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 $\geq \exp(\gamma_A)$
$T_n = T_n^I V_n^{-1} T_n$ (see notes)	$T_n \sim \chi^2_{K-1}$	$T_n \sim \chi^2_{K-1,\phi^2}$	$T_n \sim \chi_{K-1,\phi^2}^2$
		$\phi^2 = d \sum_{j=1}^K \theta_j \left\{ \log(\lambda_{jA}) - \sum_{j=1}^K \theta_j \log(\lambda_{jA}) \right\}^2$	$\phi^2 = rac{d}{K} rac{\gamma_A^2}{2}$ (equal allocation)