

Table I. Asymptotic estimators for covariance between various pairs of treatment effect estimates.

Effect size for outcome 1	Effect size for outcome 2	Covariance formula	Equation
MD	MD	$\frac{n_{12c}}{n_{1c}n_{2c}}\rho s_{1c}s_{2c} + \frac{n_{12t}}{n_{1t}n_{2t}}\rho s_{1t}s_{2t}$	(1.1)
SMD	SMD	$\frac{\rho}{s_{1p}} \left(J(v_1) \frac{n_{12c}}{n_{1c}n_{2c}} s_{1c}s_{2c} + J(v_1) \frac{n_{12t}}{n_{1t}n_{2t}} s_{1t}s_{2t} \right)$	(1.2)
logOR	logOR	$\rho s_{1c} \frac{n_{12c}\sqrt{n_{2c}}}{n_{1c}n_{2c}} \sqrt{\frac{1}{S_{2c}} + \frac{1}{F_{2c}}} + \rho s_{1t} \frac{n_{12t}\sqrt{n_{2t}}}{n_{1t}n_{2t}} \sqrt{\frac{1}{S_{2t}} + \frac{1}{F_{2t}}}$	(1.3)
logRR	logRR	$\rho s_{1c} \cdot \frac{n_{12c}}{n_{1c}n_{2c}} \cdot \sqrt{\frac{F_{2c}}{S_{2c}}} + \rho s_{1t} \cdot \frac{n_{12t}}{n_{1t}n_{2t}} \cdot \sqrt{\frac{F_{2t}}{S_{2t}}}$	(1.4)
RD	RD	$\rho s_{1c} \cdot \frac{n_{12c}}{n_{1c}n_{2c}^2} \cdot \sqrt{S_{2c}F_{2c}} + \rho s_{1t} \cdot \frac{n_{12t}}{n_{1t}n_{2t}^2} \cdot \sqrt{S_{2t}F_{2t}}$	(1.5)
SMD	SMD	$\rho \left(\frac{n_{12c}}{n_{1c}n_{2c}} + \frac{n_{12t}}{n_{1t}n_{2t}} \right) + \frac{k_{12}}{\sqrt{k_1k_2}} \rho^2 \delta_1 \delta_2 J(v_1)J(v_2) \sqrt{\left(\frac{v_1}{v_1-2} - \frac{1}{J(v_1)^2} \right) \left(\frac{v_2}{v_2-2} - \frac{1}{J(v_2)^2} \right)}$	(1.6)
logOR	logOR	$J(v_1) \frac{1}{s_{1p}} \cdot \frac{n_{12c}\sqrt{n_{2c}}}{n_{1c}n_{2c}} \rho s_{1c} \sqrt{\frac{1}{S_{2c}} + \frac{1}{F_{2c}}} + J(v_1) \frac{1}{s_{1p}} \cdot \frac{n_{12t}\sqrt{n_{2t}}}{n_{1t}n_{2t}} \rho s_{1t} \sqrt{\frac{1}{S_{2t}} + \frac{1}{F_{2t}}}$	(1.7)
logRR	logRR	$J(v_1) \frac{1}{s_{1p}} \cdot \frac{n_{12c}\sqrt{n_{2c}}}{n_{1c}n_{2c}} \rho s_{1c} \sqrt{\frac{1}{S_{2c}} + \frac{1}{F_{2c}}} + J(v_1) \frac{1}{s_{1p}} \cdot \frac{n_{12t}\sqrt{n_{2t}}}{n_{1t}n_{2t}} \rho s_{1t} \sqrt{\frac{1}{S_{2t}} + \frac{1}{F_{2t}}}$	(1.8)
RD	RD	$J(v_1) \frac{\rho}{s_{1p}} \cdot \frac{n_{12c}}{n_{1c}n_{2c}^2} \cdot s_{1c} \sqrt{S_{2c}F_{2c}} + J(v_1) \frac{\rho}{s_{1p}} \cdot \frac{n_{12t}}{n_{1t}n_{2t}^2} \cdot s_{1t} \sqrt{S_{2t}F_{2t}}$	(1.9)

Table I. Continued.

Effect size for outcome 1	Effect size for outcome 2	Covariance formula	Equation
logOR	logOR	$\frac{\rho n_{12c}}{\sqrt{n_{1c}n_{2c}}} \sqrt{\left(\frac{1}{S_{1c}} + \frac{1}{F_{1c}}\right) \left(\frac{1}{S_{2c}} + \frac{1}{F_{2c}}\right)} + \frac{\rho n_{12t}}{\sqrt{n_{1t}n_{2t}}} \sqrt{\left(\frac{1}{S_{1t}} + \frac{1}{F_{1t}}\right) \left(\frac{1}{S_{2t}} + \frac{1}{F_{2t}}\right)}$	(1.10)
	logRR	$\frac{\rho n_{12c}}{\sqrt{n_{1c}n_{2c}}} \sqrt{\left(\frac{1}{S_{1c}} + \frac{1}{F_{1c}}\right) \frac{F_{2c}}{S_{2c}} + \frac{\rho n_{12t}}{\sqrt{n_{1t}n_{2t}}} \sqrt{\left(\frac{1}{S_{1t}} + \frac{1}{F_{1t}}\right) \frac{F_{2t}}{S_{2t}}}$	(1.11)
	RD	$\rho \frac{n_{12c}}{n_{1c}n_{2c}} \sqrt{\frac{S_{2c}F_{2c}}{S_{1c}F_{1c}} + \rho \frac{n_{12t}}{n_{1t}n_{2t}}} \sqrt{\frac{S_{2t}F_{2t}}{S_{1t}F_{1t}}}$	(1.12)
logRR	logRR	$\rho \frac{n_{12c}}{n_{1c}n_{2c}} \sqrt{\frac{F_{1c}F_{2c}}{S_{1c}S_{2c}} + \rho \frac{n_{12t}}{n_{1t}n_{2t}}} \sqrt{\frac{F_{1t}F_{2t}}{S_{1t}S_{2t}}}$	(1.13)
	RD	$\rho \frac{n_{12c}}{n_{1c}n_{2c}^2} \sqrt{\frac{F_{1c}}{S_{1c}} S_{2c} F_{2c} + \rho \frac{n_{12t}}{n_{1t}n_{2t}^2}} \sqrt{\frac{F_{1t}}{S_{1t}} S_{2t} F_{2t}}$	(1.14)
RD	RD	$\rho \frac{n_{12c}}{n_{1c}^2 n_{2c}^2} \sqrt{S_{1c} F_{1c} S_{2c} F_{2c} + \rho \frac{n_{12t}}{n_{1t}^2 n_{2t}^2}} \sqrt{S_{1t} F_{1t} S_{2t} F_{2t}}$	(1.15)

MD: mean differences; SMD: standardized MD; logOR: log odds ratio; logRR: log risk ratio; RD: risk difference; n_{1t} : number of participants reporting outcome 1 in treatment group; n_{2t} : number of participants reporting outcome 2 in treatment group; n_{12t} : number of participants reporting both outcome 1 and outcome 2 in treatment group; n_{1c} , n_{2c} , and n_{12c} : defined in the similar way for control group; s_{1t}^2 : sample variance for outcome 1 in treatment group; s_{2t}^2 : sample variance for outcome 2 in treatment group; s_{1c}^2 and s_{2c}^2 : defined in a similar way for control group; $s_{j\bar{p}}$: pooled standard deviation for outcome j ; $J(v)$: a small-sample correction factor for SMD, $J(v) = 1 - 3/(4v - 2)$; $v_1 = n_{1c} + n_{1t} - 2$; $v_2 = n_{2c} + n_{2t} - 2$; S_{1t} : number of participants with event for outcome 1 (dichotomous) in treatment group; F_{1t} : number of participants without event for outcome 1 (dichotomous) in treatment group; S_{1c} and F_{1c} : defined in a similar way for control group; ρ : correlation between outcome measurements; $k_2 = \frac{2n_{2t} - 2}{(n_{2c} + n_{2t} - 2)^2} + \frac{2n_{1t} - 2}{(n_{1c} + n_{1t} - 2)^2}$; $k_1 = \frac{2n_{2c} - 2}{(n_{2c} + n_{2t} - 2)^2} + \frac{2n_{1c} - 2}{(n_{1c} + n_{1t} - 2)^2}$; $k_{12} = \frac{2}{(n_{1t} + n_{1c} - 2)(n_{2t} + n_{2c} - 2)} \left(\frac{n_{1t}n_{2t}}{n_{1t} + n_{2t} - 1} + \frac{n_{1c}n_{2c}}{n_{1c} + n_{2c} - 1} - 2 \right)$.