Survival Sample Size

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Overall number of events needed:

$$d = \frac{(z_\beta + z_{1-\alpha})^2}{Q_1 Q_0 (\log \rho_h)^2}$$

where ρ_h = relative hazard

Given
r_0 = baseline event rate = $\frac{\ln(2)}{t_{\frac{1}{2}}}$
$r_1 = \rho_h r_0$ = event rate in group 1
$c_0 = c_1$ = common censoring rate (I was going to allow different censoring, but changed my mind)
t_0 = average length of follow-up
Cumulative event rate in Group 1:

$$P_1 = \frac{r_1}{r_1 + c_1}(1 - e^{-(r_1+c_1)t_0})$$

Cumulative event rate in Group 0:

$$P_0 = \frac{r_0}{r_0 + c_0}(1 - e^{-(r_0+c_0)t_0})$$

Overall cumulative event rate:

$$Q_1 P_1 + Q_0 P_0$$

Total number needed:

$$N = \frac{d}{Q_1 P_1 + Q_0 P_0}$$

Once you have N, $n_1 = Q_1 N$, $n_0 = Q_0 N$, $d_1 = P_1 n_1$. $d_0 = P_0 n_0$