Additional file 1 — Calculation of the parameters of the different censoring mechanisms.

The censoring mechanism was assumed to be independent uniform $C_i \sim \mathcal{U}(0, r)$ or exponential $C_i \sim \mathcal{E}(\gamma)$.

- For a Cox proportional hazards model, the survival function was exponential with parameters $\lambda = \lambda_0 e^{\beta z}$.

In order to determine $r$ and $\gamma$ for a given value of the expected overall percentage $p_c$ of censoring, we solved iteratively for $r_p$ and $\gamma_p$ (value of $r$ and $\gamma$ for a given percentage of censoring $p_c$, respectively) in the following equations.

Under the null hypothesis ($\beta = 0$), the equations to solve were

$$p_c = \frac{1}{\lambda_0 r_p} \left(1 - e^{-\lambda_0 r_p}\right), \text{ for a uniform censoring}$$

and

$$p_c = \frac{\gamma_p}{\lambda_0 + \gamma_p}, \text{ for an exponential censoring}$$

Under the alternative hypothesis (i.e. with covariate, $\beta \neq 0$), the equations to solve were

$$p_c = \int_R \left\{ \frac{1}{r_p \lambda_0 \exp(\beta z)} \left(1 - e^{-\lambda_0 r_p \exp(\beta z)}\right) f_Z(z) \right\} dz$$

for a uniform censoring, and

$$p_c = \int_R \left\{ \frac{\gamma_p}{\gamma_p + \lambda_0 \exp(\beta z)} f_Z(z) \right\} dz$$

for an exponential censoring. The function $f_Z(z)$ denote the density of the covariate $Z$.

- Under a proportional odds model, $T$ had a log-logistic distribution with density

$$f(t) = \frac{\lambda_0 e^{-\beta z}}{(1 + te^{-\beta z})^2}. \text{ In this case, the equations to solve under the null hypothesis were}$$

$$p_c = \frac{\ln(r)}{r}, \text{ for a uniform censoring}$$

and

$$p_c = \int_0^\infty \frac{\gamma e^{-\gamma c}}{1 + c} dc, \text{ for an exponential censoring}$$

Under the alternative hypothesis, the equations were

$$p_c = \int_R \left\{ \frac{\ln(1 + re^{-\beta z})}{r} f_Z(z) \right\} dz$$

for a uniform censoring, and

$$p_c = \int_R \left\{ \int_0^\infty \left( \frac{\gamma e^{-\gamma c}}{1 + ce^{-\beta z}} \right) dc \right\} f_Z(z) dz$$

for an exponential censoring.
For both models, for one subject $i$ and for a uniform censoring, two independent uniform variates $U_{0.25}^i$ and $U_{0.5}^i$ on $\{0,r_{0.25}^i\}$ and $\{0,r_{0.5}^i\}$ were generated, respectively. For an exponential censoring, two independent exponential variates $E_{0.25}^i$ and $E_{0.5}^i$ with parameters $\gamma_{0.25}^i$ and $\gamma_{0.5}^i$ were generated, respectively. In both cases, the three variates $T^i$, $\min(T^i, C_{0.25}^i)$ and $\min(T^i, C_{0.5}^i)$, with $C^i = U^i$ or $E^i$, represent the observed times for the subject $i$ in three situations with an expected percentage of censoring equal to 0, 25 and 50%, respectively.