Likelihood of the distributions used

The likelihood of a Weibull proportional hazards model for the *n* trial subjects is written as

$$L(\beta_0, \gamma | D) = \prod_{i=1}^{n} \left[\exp\{\beta_0\} \frac{1}{\gamma} t_i^{\frac{1}{\gamma}-1} \right]^{\nu_i} exp \left\{ -exp\{\beta_0\} t_i^{\frac{1}{\gamma}} \right\}$$

where γ is the scale parameter, β_0 is the intercept, $t = (t_1, t_2, \dots, t_n)$ represents survival times, and where $\nu_i = 1$ if the i[th] subject failed, and 0 if t_i did not fail.

For a piecewise exponential model, where the time axis is divided in J intervals $(0,\ s_1], (s_1, s_2], \dots, (s_{J-1}, s_J]$ and where we assume constant baseline hazard (λ_j) for $t_i \in\ I_j = (s_{j-1}, s_j]$, the hazard function is as follows

$$h_i(t) =\ \lambda_j \times \exp(\beta \times trt) \qquad for\ s_{j-1} < t < s_j$$

The likelihood of a piecewise model for the *n* trial subjects is written as

$$L(\lambda | D) = \prod_{i=1}^{n} \prod_{j=1}^{J} (\lambda_j)^{\delta_{ij}\nu_i} exp \left\{ -\delta_{ij} \left[\lambda_j (t_i - s_{j-1}) + \sum_{g=1}^{j-1} \lambda_g (s_g - s_{g-1}) \right] \right\}$$

Letting λ_j with $j = 1, \dots, J$ be the baseline hazard in each interval, and $\delta_i = 1$ of the i[th] subject failed or was censored in the j[th] interval, and 0 otherwise.