### Transitivity Property

1. **Description of the transitivity property for each survival distribution**

Weibull distribution. The hazard function is

This can be written as

, with .

Transitivity of log HR at time t can be proven as

)

)

Exponential distribution. The hazard function is

This can be written as

, with

Transitivity of log HR at time t can be proven as

Gompertz distribution. The hazard function is

This can be written as

, with .

Transitivity of log HR at time t can be proven as

)

)

Log-logistic distribution. The failure odds in a log-logistic model (Poyston and Parmar, 2002) is

This can be written as

, with

Transitivity of log-odds ratio at time t can be proven as

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)

Log-normal distribution. The survival function is

, with the cumulative distribution function of the standard normal distribution.

This can be written as

, with

Transitivity of relative treatment effect at time t can be proven as

)

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*NMA method - details*

With a fixed-effects model for network meta-analysis, it was assumed that there was no variation in the treatment effect between studies. As presented in Ouwens et al. (2010), the model was defined as follows:

(1)

In this formula, represents the underlying hazard rate in study for treatment at time point . The vectors are treatment-specific and reflect the parameters and of the “baseline” treatment in study . In our case study, everolimus was the “baseline” treatment in METEOR, CheckMate025, and RECORD-1; placebo was the “baseline” treatment in TARGET and sorafenib was the “baseline” treatment in AXIS. The vector reflects the study-specific difference in scale and shape of the log-hazard curve for treatment relative to the “baseline” treatment in study . In our case study, treatment corresponded to cabozantinib in METEOR, nivolumab in CheckMate025, placebo in RECORD-1, sorafenib in TARGET and axitinib in AXIS.

Estimation of model parameters of interest – baseline and effect vectors – was performed in Bayesian framework. The prior distributions as used for the parameters of the fixed-effects model were chosen non-informative as follows: