Meta-analysis of two studies in the presence of heterogeneity with applications in rare diseases: Supplementary material

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1 Example applications

The following figures (1–5) show data and effect estimates in analogy to Figure 1 in the main paper, but as a sensitivity check in addition using the lognormal and inverse-gamma priors. Note that half-Normal and log-Normal priors are assumed for the heterogeneity (τ) while the inverse-Gamma prior is assumed for the squared heterogeneity (τ^2); see also Section 3.7.



Crins et al. example: acute graft rejection

Figure 1: Crins & al. example: acute rejection, randomized studies.

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Miller et al. example: mortality

Figure 2: Miller & al. example: mortality.

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experimental events total events Study 3101 89 150 Study 3102 106 148	control nts total 29 148 ← – – – – 53 154 ← – – –	5.99 [3.56 , 10.07] 4.81 [2.95 , 7.84]
HNorm(1.00) (tau = 0.37) HNorm(0.50) (tau = 0.24) LNorm(-1.741,1.046) (tau = INorm(-1.048,1.046) (tau = invGamma(0.5,0.0076) (tau invGamma(0.5,0.0019) (tau DL-Normal (tau = 0.00) DL-HKSJ (tau = 0.00) DL-mKH (tau = 0.00)	0.23) 0.14) = 0.14) = 0.08)	$\begin{array}{c} 5.34 \left[1.80 , 15.95 \right] \\ 5.34 \left[2.73 , 10.48 \right] \\ 5.34 \left[2.56 , 11.19 \right] \\ 5.34 \left[3.18 , 8.98 \right] \\ 5.34 \left[3.14 , 9.08 \right] \\ 5.33 \left[3.45 , 8.25 \right] \\ 5.33 \left[3.45 , 8.25 \right] \\ 5.33 \left[3.73 , 7.61 \right] \\ 5.33 \left[1.33 , 21.36 \right] \\ 5.33 \left[0.53 , 53.58 \right] \end{array}$
1.00 10.00 odds ratio		

Mozobil example: HSC mobilization

Figure 3: Mozobil example: HSC mobilization.



Figure 4: Romiplostim example: rescue medication.

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experimental control events total events total Study C405 11 43 1 20 Study C406 11 42 1 23	6.53 [0.78 , 54.65] 7.81 [0.94 , 64.96]
HNorm(1.00) (tau = 0.55) HNorm(0.50) (tau = 0.31) LNorm(-1.741,1.046) (tau = 0.30) invGamma(0.5,0.0076) (tau = 0.17) invGamma(0.5,0.0019) (tau = 0.09) DL-Normal (tau = 0.00) DL-HKSJ (tau = 0.00) DL-mKH (tau = 0.00)	7.14 [1.04 , 49.15] 7.14 [1.39 , 36.70] 7.14 [1.25 , 40.80] 7.14 [1.46 , 35.01] 7.14 [1.39 , 36.57] 7.14 [1.39 , 34.08] 7.14 [1.59 , 32.01] 7.14 [2.30 , 22.18]
0.01 1.00	
odds ratio	

Krystexxa example: infusion reaction

Figure 5: Krystexxa example: infusion reaction

2 Simulation results

The following figures (6–8) illustrate the results of the simulation study (analogous to Section 4 in the main paper), in addition showing results for the corresponding log-normal and inverse-gamma priors; see also Section 3.7 for the exact prior definitions.



Figure 6: Heterogeneity bias.



Figure 7: Effect estimate coverage (dotted: normal approx., dashed: HKSJ, solid: mKH).



Figure 8: Mean effect CI length (dotted: normal approx., dashed: HKSJ, solid: mKH).

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