**Title**

Does the choice of prior matters in a Bayesian approach to meta-analysis of rare events?

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Target Journal: Reasearch synthesis methods

Short title: Choice of priors in rare events meta-analysis

**Tables**

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| Table 1. List of prior distributions for  |
| Parameter | **Prior distribution** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| 1. \*
 |  where |
|  |  |
|  |  |
| \* hierarchical structure on  |

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| **Table 2.** List of prior distributions for  |
| **Parameter** | **Prior distribution** | **Mean** |
|   |  |  |
|  |  |  |
|  | *half-normal* |  |
|  |  |  |

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| **Table 3**. Parameter values used in the simulation of MA data sets |
| **FE scenarios** |  |
|   | 0 or 0.69 |
|  Number of patients in treatment group  | [20, 60] |
|  Risk of control group () | [0.001, 0.04] |
|  Number of trials in each MA | 10, 20 or 50 |
| **RE scenarios** |  |
|  \* |  |
|   | 0 or 0.69 |
|  Random effects standard deviation() | 0.2 or 0.5 |
|  Number of patients in treatment group  | [10, 60] |
|  Risk of control group () | [0.001, 0.035] |
|  Number of trials in each MA | 20 or 50 |
| **Both** **FE & REs** **scenarios** |  |
|  Ratio of group sizes\*\* | 1:1, 1:2 or 1:4  |
|  Number of simulated MA data sets | 1000 |
| \* follows a normal distribution with specified characteristics\*\* We assigned treatment vs. control group for the ratio of group sizes |

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| Table 4. 95% coverage and bias for different scenarios of FE MA for log(OR) = 0 and log(OR) = 0.69 |
| Prior for  | **Ratio a** | **Deletion b** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Gel. & Rub. Statistic c** |
|  |  |  |  **= 0** |  **= 0.69** |  |
| *normal(0, 10)* | **≤ 30%** d | **>30%** | **≤ 30%** | **>30%** |
|  | 1:1 | 0 | 0.941 | -0.033 | 0.945 | -0.071 | 0.952 | 0 | 0.949 | -0.045 | 1.0015 |
|  | 1:2 | 0 | 0.947 | -0.047 | 0.942 | -0.083 | 0.946 | -0.015 | 0.942 | -0.045 | 1.0013 |
|  | 1:4 | 0 | 0.942 | -0.089 | 0.953 | -0.093 | 0.951 | -0.025 | 0.943 | -0.044 | 1.0012 |
|  | 1:1 | 1 | 0.942 | -0.032 | 0.944 | -0.071 | 0.953 | -0.002 | 0.950 | -0.044 | 1.0015 |
|  | 1:2 | 1 | 0.942 | -0.047 | 0.941 | -0.082 | 0.946 | -0.015 | 0.943 | -0.045 | 1.0013 |
|  | 1:4 | 1 | 0.942 | -0.088 | 0.952 | -0.094 | 0.951 | -0.026 | 0.943 | -0.044 | 1.0012 |
| *normal(0, 100)* |
|  | 1:1 | 0 | 0.939 | 0.002 | 0.939 | 0 | 0.942 | 0.057 | 0.940 | 0.062 | 1.0017 |
|  | 1:2 | 0 | 0.948 | -0.019 | 0.945 | -0.034 | 0.943 | 0.028 | 0.939 | 0.023 | 1.0013 |
|  | 1:4 | 0 | 0.945 | -0.058 | 0.951 | -0.063 | 0.951 | 0.006 | 0.939 | 0.015 | 1.0012 |
|  | 1:1 | 1 | 0.939 | 0.003 | 0.939 | 0.001 | 0.942 | 0.056 | 0.939 | 0.059 | 1.0017 |
|  | 1:2 | 1 | 0.948 | -0.020 | 0.945 | -0.033 | 0.944 | 0.027 | 0.940 | 0.023 | 1.0013 |
|  | 1:4 | 1 | 0.944 | -0.058 | 0.953 | -0.063 | 0.952 | 0.006 | 0.940 | 0.012 | 1.0012 |
| *unif(-10, 10)* |
|  | 1:1 | 0 | 0.940 | 0.001 | 0.940 | -0.004 | 0.945 | 0.056 | 0.942 | 0.051 | 1.0015 |
|  | 1:2 | 0 | 0.946 | -0.020 | 0.946 | -0.036 | 0.944 | 0.027 | 0.940 | 0.019 | 1.0013 |
|  | 1:4 | 0 | 0.945 | -0.059 | 0.953 | -0.064 | 0.952 | 0.006 | 0.940 | 0.010 | 1.0012 |
|  | 1:1 | 1 | 0.939 | 0.002 | 0.940 | -0.004 | 0.944 | 0.054 | 0.944 | 0.053 | 1.0015 |
|  | 1:2 | 1 | 0.948 | -0.020 | 0.946 | -0.036 | 0.944 | 0.026 | 0.940 | 0.019 | 1.0013 |
|  | 1:4 | 1 | 0.944 | -0.057 | 0.951 | -0.064 | 0.952 | 0.004 | 0.939 | 0.009 | 1.0012 |
| *Hierarchical* |
|  | 1:1 | 0 | 0.945 | 0.024 | 0.945 | 0.015 | 0.949 | 0.044 | 0.947 | 0.029 | 1.0128 |
|  | 1:2 | 0 | 0.950 | -0.016 | 0.947 | -0.032 | 0.946 | 0.017 | 0.941 | 0.010 | 1.0075 |
|  | 1:4 | 0 | 0.945 | -0.057 | 0.954 | -0.062 | 0.952 | 0.001 | 0.942 | -0.008 | 1.0039 |
|  | 1:1 | 1 | 0.945 | 0.023 | 0.944 | 0.016 | 0.947 | 0.042 | 0.946 | 0.031 | 1.0129 |
|  | 1:2 | 1 | 0.949 | -0.015 | 0.947 | -0.032 | 0.946 | 0.019 | 0.942 | 0.009 | 1.0074 |
|  | 1:4 | 1 | 0.946 | -0.057 | 0.953 | -0.063 | 0.953 | 0.001 | 0.943 | -0.006 | 1.0039 |
| *Mantel-Haenszel* |
|  | 1:1 | 0 | 0.957 | 0.008 | 0.974 | 0.005 | 0.962 | 0.034 | 0.963 | 0.028 | NA |
|  | 1:2 | 0 | 0.962 | -0.003 | 0.970 | -0.037 | 0.959 | 0.005 | 0.962 | 0.008 | NA |
|  | 1:4 | 0 | 0.970 | -0.063 | 0.963 | -0.046 | 0.964 | -0.017 | 0.961 | -0.012 | NA |
| a We assigned treatment vs. control group for the ratio of group sizesb deletion is a logical argument; zero means trials with zero in both arms are excluded from the analyses.c The Gelman and Rubin diagnostic is used to check the convergence of multiple mcmc chains run in parallel.d Percentage of trials with no events in both arms. |

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| Table 5. 95% coverage and bias for different scenarios of REs MA log(OR) = 0 for half-normal (mean = 0.5) |
| Prior for  | **Ratio a** | **Deletion b** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Gel. & Rub. Statistic c** |
|  |  |  |  **= 0.2** |  **= 0.5** |  |
|  |  |  | **≤ 30%** d | **>30%** | **≤ 30%** | **>30%** |  |
| *normal(0, 10)* |  |  |  |  |
|  | 1:1 | 0 | 0.949 | -0.014 | 0.953 | -0.043 | 0.927 | 0.082 | 0.946 | 0.074 | 1.0065 |
|  | 1:2 | 0 | 0.945 | -0.050 | 0.945 | -0.111 | 0.935 | 0.038 | 0.935 | -0.040 | 1.0074 |
|  | 1:4 | 0 | 0.939 | -0.135 | 0.957 | -0.162 | 0.937 | -0.007 | 0.955 | -0.052 | 1.0095 |
|  | 1:1 | 1 | 0.949 | -0.010 | 0.954 | -0.047 | 0.927 | 0.082 | 0.945 | 0.072 | 1.0066 |
|  | 1:2 | 1 | 0.945 | -0.053 | 0.944 | -0.109 | 0.935 | 0.038 | 0.935 | -0.040 | 1.0070 |
|  | 1:4 | 1 | 0.942 | -0.137 | 0.953 | -0.160 | 0.938 | -0.008 | 0.953 | -0.051 | 1.0093 |
| *normal(0, 100)* |
|  | 1:1 | 0 | 0.947 | 0.029 | 0.948 | 0.019 | 0.917 | 0.127 | 0.932 | 0.137 | 1.0067 |
|  | 1:2 | 0 | 0.949 | -0.023 | 0.942 | -0.057 | 0.933 | 0.065 | 0.934 | 0.020 | 1.0075 |
|  | 1:4 | 0 | 0.943 | -0.107 | 0.954 | -0.122 | 0.937 | 0.015 | 0.951 | -0.011 | 1.0092 |
|  | 1:1 | 1 | 0.950 | 0.029 | 0.948 | 0.021 | 0.917 | 0.125 | 0.933 | 0.136 | 1.0066 |
|  | 1:2 | 1 | 0.949 | -0.026 | 0.943 | -0.060 | 0.933 | 0.065 | 0.934 | 0.022 | 1.0074 |
|  | 1:4 | 1 | 0.941 | -0.103 | 0.956 | -0.121 | 0.938 | 0.013 | 0.953 | -0.012 | 1.0093 |
| *Hierarchical* |
|  | 1:1 | 0 | 0.943 | -0.023 | 0.950 | -0.032 | 0.928 | 0.067 | 0.938 | 0.073 | 1.0187 |
|  | 1:2 | 0 | 0.942 | -0.055 | 0.945 | -0.093 | 0.932 | 0.025 | 0.936 | -0.019 | 1.0140 |
|  | 1:4 | 0 | 0.941 | -0.127 | 0.953 | -0.152 | 0.939 | -0.016 | 0.953 | -0.048 | 1.0121 |
|  | 1:1 | 1 | 0.943 | -0.021 | 0.948 | -0.031 | 0.930 | 0.071 | 0.939 | 0.072 | 1.0187 |
|  | 1:2 | 1 | 0.941 | -0.053 | 0.941 | -0.095 | 0.932 | 0.021 | 0.936 | -0.019 | 1.0141 |
|  | 1:4 | 1 | 0.940 | -0.128 | 0.955 | -0.147 | 0.941 | -0.017 | 0.957 | -0.046 | 1.0119 |
| *Mantel-Haenszel* |
|  | 1:1 | 0 | 0.955 | 0.027 | 0.959 | 0.031 | 0.902 | 0.125 | 0.946 | 0.129 | NA |
|  | 1:2 | 0 | 0.944 | 0.007 | 0.957 | 0 | 0.894 | 0.107 | 0.948 | 0.068 | NA |
|  | 1:4 | 0 | 0.955 | -0.020 | 0.959 | 0.011 | 0.898 | 0.087 | 0.938 | 0.116 | NA |
| a We assigned treatment vs. control group for the ratio of group sizesb deletion is a logical argument; zero means trials with zero in both arms are excluded from the analyses.c The Gelman and Rubin diagnostic is used to check the convergence of multiple mcmc chains run in parallel.d Percentage of trials with no events in both arms. |

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| Table 6. 95% coverage and bias for different scenarios of REs MA log(OR) = 0.69 for *half-normal (mean = 0.5)* |
| Prior for  | **Ratio a** | **Deletion b** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Coverage** | **Bias** | **Gel. & Rub. Statistic c** |
|  |  |  |  **= 0.2** |  **= 0.5** |  |
|  |  |  | **≤ 30%** d | **>30%** | **≤ 30%** | **>30%** |  |
| *normal(0, 10)* |  |  |  |  |
|  | 1:1 | 0 | 0.956 | 0.023 | 0.960 | 0.020 | 0.918 | 0.128 | 0.951 | 0.098 | 1.0084 |
|  | 1:2 | 0 | 0.947 | 0.002 | 0.948 | -0.036 | 0.928 | 0.090 | 0.939 | 0.073 | 1.0071 |
|  | 1:4 | 0 | 0.946 | -0.037 | 0.944 | -0.085 | 0.933 | 0.042 | 0.934 | 0.027 | 1.0071 |
|  | 1:1 | 1 | 0.957 | 0.024 | 0.961 | 0.017 | 0.920 | 0.127 | 0.949 | 0.100 | 1.0087 |
|  | 1:2 | 1 | 0.948 | 0.003 | 0.947 | -0.036 | 0.929 | 0.091 | 0.937 | 0.072 | 1.0070 |
|  | 1:4 | 1 | 0.944 | -0.037 | 0.943 | -0.085 | 0.933 | 0.043 | 0.939 | 0.028 | 1.0069 |
| *normal(0, 100)* |
|  | 1:1 | 0 | 0.940 | 0.083 | 0.946 | 0.128 | 0.895 | 0.189 | 0.912 | 0.209 | 1.0087 |
|  | 1:2 | 0 | 0.943 | 0.038 | 0.944 | 0.039 | 0.912 | 0.132 | 0.920 | 0.150 | 1.0069 |
|  | 1:4 | 0 | 0.945 | -0.006 | 0.945 | -0.036 | 0.983 | 0.074 | 0.927 | 0.081 | 1.0073 |
|  | 1:1 | 1 | 0.940 | 0.086 | 0.941 | 0.130 | 0.896 | 0.192 | 0.914 | 0.216 | 1.0089 |
|  | 1:2 | 1 | 0.944 | 0.039 | 0.941 | 0.041 | 0.914 | 0.132 | 0.920 | 0.148 | 1.0067 |
|  | 1:4 | 1 | 0.944 | -0.010 | 0.947 | -0.034 | 0.928 | 0.073 | 0.925 | 0.080 | 1.0074 |
| *Hierarchical* |
|  | 1:1 | 0 | 0.945 | 0.005 | 0.949 | 0.027 | 0.923 | 0.083 | 0.934 | 0.111 | 1.0390 |
|  | 1:2 | 0 | 0.939 | -0.018 | 0.941 | -0.025 | 0.929 | 0.059 | 0.930 | 0.079 | 1.0198 |
|  | 1:4 | 0 | 0.939 | -0.056 | 0.942 | -0.087 | 0.932 | 0.018 | 0.936 | 0.026 | 1.0120 |
|  | 1:1 | 1 | 0.948 | 0.004 | 0.949 | 0.026 | 0.922 | 0.087 | 0.933 | 0.111 | 1.0380 |
|  | 1:2 | 1 | 0.943 | -0.017 | 0.942 | -0.026 | 0.927 | 0.057 | 0.931 | 0.074 | 1.0195 |
|  | 1:4 | 1 | 0.939 | -0.056 | 0.940 | -0.086 | 0.933 | 0.019 | 0.935 | 0.020 | 1.0121 |
| *Mantel-Haenszel* |
|  | 1:1 | 0 | 0.951 | 0.037 | 0.966 | 0.060 | 0.909 | 0.136 | 0.954 | 0.153 | NA |
|  | 1:2 | 0 | 0.934 | 0.024 | 0.959 | 0.027 | 0.895 | 0.121 | 0.937 | 0.131 | NA |
|  | 1:4 | 0 | 0.944 | 0.008 | 0.963 | 0.007 | 0.895 | 0.104 | 0.934 | 0.106 | NA |
| a We assigned treatment vs. control group for the ratio of group sizesb deletion is a logical argument; zero means trials with zero in both arms are excluded from the analyses.c The Gelman and Rubin diagnostic is used to check the convergence of multiple mcmc chains run in parallel.d Percentage of trials with no events in both arms. |