Supplementary materials for ‘Openness and computational reproducibility in plant pathology: where do we stand and a way forward’

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# Supplementary Materials

## Supplementary Tables

Table 1: Full description of model fit for the effect of journal title on code availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with abbreviation (formula: comp\_mthds\_avail ~ abbreviation). The model included assignee as random effect (formula: ~1 | assignee). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 0.17 | 0.95 | -1.39 | 1.71 | 0.59 | 19% | 1.00 | 20,885.20 |  |
| Intercept[2] | 0.56 | 0.95 | -0.98 | 2.09 | 0.77 | 15% | 1.00 | 22,977.13 |  |
| AustralasPlantPath | -0.12 | 0.95 | -2.03 | 1.65 | 0.55 | 16% | 1.00 | 30,384.50 |  |
| CanJPlantPathol | -0.18 | 0.95 | -2.06 | 1.57 | 0.58 | 16% | 1.00 | 31,898.52 |  |
| CropProt | -0.22 | 0.95 | -2.02 | 1.44 | 0.60 | 17% | 1.00 | 30,761.34 |  |
| EurJPlantPathol | -0.17 | 0.95 | -2.02 | 1.54 | 0.57 | 16% | 1.00 | 28,146.82 |  |
| ForestPathol | -0.20 | 0.95 | -2.00 | 1.50 | 0.58 | 16% | 1.00 | 31,905.00 |  |
| JPhytopathol | -0.33 | 0.95 | -2.08 | 1.30 | 0.65 | 16% | 1.00 | 31,231.12 |  |
| JPlantPathol | -0.21 | 0.95 | -2.05 | 1.48 | 0.59 | 16% | 1.00 | 29,063.96 |  |
| MolPlantMicroIn | 0.49 | 0.95 | -1.24 | 2.06 | 0.72 | 15% | 1.00 | 30,218.34 |  |
| MolPlantPathol | -0.26 | 0.95 | -2.07 | 1.39 | 0.61 | 17% | 1.00 | 31,148.37 |  |
| Nematology | -0.20 | 0.95 | -2.05 | 1.50 | 0.59 | 16% | 1.00 | 31,651.84 |  |
| PhysiolMolPlantP | -0.21 | 0.95 | -2.03 | 1.46 | 0.60 | 17% | 1.00 | 30,455.31 |  |
| Phytoparasitica | -0.24 | 0.95 | -2.10 | 1.44 | 0.61 | 17% | 1.00 | 30,266.81 |  |
| PhytopatholMediterr | -0.19 | 0.95 | -2.10 | 1.54 | 0.58 | 16% | 1.00 | 29,854.90 |  |
| PlantDis | -0.17 | 0.95 | -2.05 | 1.54 | 0.57 | 16% | 1.00 | 26,753.21 |  |
| PlantHealthProgress | -0.15 | 0.95 | -2.02 | 1.61 | 0.56 | 16% | 1.00 | 30,382.01 |  |
| PlantPathol | -0.24 | 0.95 | -2.08 | 1.43 | 0.61 | 17% | 1.00 | 32,634.40 |  |
| RevMexFitopatol | -0.22 | 0.95 | -2.08 | 1.42 | 0.60 | 16% | 1.00 | 29,507.33 |  |
| TropPlantPathol | 0.66 | 0.95 | -1.16 | 2.34 | 0.77 | 12% | 1.00 | 29,671.83 |  |
| VirolJ | -0.13 | 0.95 | -1.98 | 1.60 | 0.56 | 17% | 1.00 | 31,229.60 |  |
| ELPD |  |  |  |  |  |  |  |  | -34.10 |
| LOOIC |  |  |  |  |  |  |  |  | 68.21 |
| WAIC |  |  |  |  |  |  |  |  | 66.58 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

Table 2: Full description of model fit for the effect of journal title on data availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with abbreviation (formula: comp\_mthds\_avail ~ abbreviation). The model included assignee as random effect (formula: ~1 | assignee). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 0.39 | 0.95 | -0.96 | 1.69 | 0.72 | 18% | 1.00 | 4,719.32 |  |
| Intercept[2] | 0.67 | 0.95 | -0.66 | 1.96 | 0.83 | 13% | 1.00 | 4,808.63 |  |
| Intercept[3] | 1.14 | 0.95 | -0.19 | 2.43 | 0.95 | 6% | 1.00 | 4,868.56 |  |
| AustralasPlantPath | 0.62 | 0.95 | -0.71 | 1.84 | 0.83 | 14% | 1.00 | 22,512.63 |  |
| CanJPlantPathol | 0.30 | 0.95 | -0.83 | 1.32 | 0.70 | 23% | 1.00 | 20,869.52 |  |
| CropProt | -1.23 | 0.95 | -2.73 | 0.02 | 0.97 | 3% | 1.00 | 20,199.84 |  |
| EurJPlantPathol | 0.08 | 0.95 | -1.11 | 1.15 | 0.55 | 26% | 1.00 | 21,647.41 |  |
| ForestPathol | -0.09 | 0.95 | -1.26 | 0.95 | 0.57 | 27% | 1.00 | 21,567.86 |  |
| JPhytopathol | -0.25 | 0.95 | -1.22 | 0.62 | 0.71 | 28% | 1.00 | 18,003.18 |  |
| JPlantPathol | 0.15 | 0.95 | -0.94 | 1.14 | 0.62 | 26% | 1.00 | 20,336.25 |  |
| MolPlantMicroIn | 0.54 | 0.95 | -0.43 | 1.47 | 0.87 | 17% | 1.00 | 19,561.11 |  |
| MolPlantPathol | 0.94 | 0.95 | 0.10 | 1.75 | 0.99 | 1% | 1.00 | 16,326.91 |  |
| Nematology | -0.19 | 0.95 | -1.51 | 0.95 | 0.62 | 23% | 1.00 | 22,360.61 |  |
| PhysiolMolPlantP | 0.59 | 0.95 | -0.34 | 1.47 | 0.89 | 15% | 1.00 | 17,765.30 |  |
| Phytoparasitica | -0.47 | 0.95 | -1.72 | 0.62 | 0.79 | 20% | 1.00 | 21,343.22 |  |
| PhytopatholMediterr | 1.68 | 0.95 | 0.78 | 2.57 | 1.00 | 0% | 1.00 | 17,609.88 |  |
| PlantDis | -1.26 | 0.95 | -2.74 | -0.02 | 0.98 | 2% | 1.00 | 22,282.14 |  |
| PlantHealthProgress | -0.59 | 0.95 | -2.01 | 0.64 | 0.82 | 16% | 1.00 | 21,371.07 |  |
| PlantPathol | -0.08 | 0.95 | -1.08 | 0.83 | 0.57 | 30% | 1.00 | 19,017.40 |  |
| RevMexFitopatol | -1.15 | 0.95 | -2.64 | 0.12 | 0.96 | 5% | 1.00 | 24,184.64 |  |
| TropPlantPathol | 0.35 | 0.95 | -0.76 | 1.39 | 0.74 | 22% | 1.00 | 20,363.83 |  |
| VirolJ | 0.87 | 0.95 | -0.03 | 1.73 | 0.97 | 4% | 1.00 | 17,099.91 |  |
| ELPD |  |  |  |  |  |  |  |  | -284.23 |
| LOOIC |  |  |  |  |  |  |  |  | 568.45 |
| WAIC |  |  |  |  |  |  |  |  | 568.32 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

Table 3: Full description of model fit for the effect of year of publication on code availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with year (formula: comp\_mthds\_avail ~ year). The model included abbreviation and assignee as random effects (formula: list(~1 | abbreviation, ~1 | assignee)). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), student\_t (location = 0.00, scale = 2.50) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 0.29 | 0.95 | -1.32 | 1.89 | 0.64 | 17% | 1.00 | 26,019.38 |  |
| Intercept[2] | 0.69 | 0.95 | -0.89 | 2.27 | 0.81 | 13% | 1.00 | 28,269.82 |  |
| 2013 | -0.27 | 0.95 | -2.04 | 1.43 | 0.62 | 17% | 1.00 | 31,204.22 |  |
| 2014 | -0.27 | 0.95 | -2.05 | 1.40 | 0.62 | 17% | 1.00 | 31,303.13 |  |
| 2015 | 0.39 | 0.95 | -1.31 | 2.00 | 0.68 | 16% | 1.00 | 31,206.26 |  |
| 2016 | 0.45 | 0.95 | -1.22 | 2.03 | 0.70 | 15% | 1.00 | 31,868.73 |  |
| 2017 | -0.30 | 0.95 | -2.09 | 1.38 | 0.64 | 16% | 1.00 | 31,420.05 |  |
| 2018 | -0.29 | 0.95 | -2.07 | 1.43 | 0.63 | 16% | 1.00 | 33,386.38 |  |
| 2019 | 0.79 | 0.95 | -0.77 | 2.27 | 0.84 | 11% | 1.00 | 30,931.25 |  |
| 2020 | -0.30 | 0.95 | -2.08 | 1.36 | 0.63 | 17% | 1.00 | 29,246.60 |  |
| 2021 | 0.36 | 0.95 | -1.32 | 1.93 | 0.67 | 17% | 1.00 | 30,811.06 |  |
| ELPD |  |  |  |  |  |  |  |  | -31.78 |
| LOOIC |  |  |  |  |  |  |  |  | 63.55 |
| WAIC |  |  |  |  |  |  |  |  | 61.86 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

Table 4: Full description of model fit for the effect of year of publication on data availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with year (formula: comp\_mthds\_avail ~ year). The model included abbreviation and assignee as random effects (formula: list(~1 | abbreviation, ~1 | assignee)). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), student\_t (location = 0.00, scale = 2.50) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 0.44 | 0.95 | -0.89 | 1.72 | 0.74 | 18% | 1.00 | 6,316.19 |  |
| Intercept[2] | 0.73 | 0.95 | -0.60 | 2.00 | 0.86 | 13% | 1.00 | 6,420.33 |  |
| Intercept[3] | 1.21 | 0.95 | -0.14 | 2.49 | 0.96 | 4% | 1.00 | 6,604.10 |  |
| 2013 | -0.38 | 0.95 | -1.38 | 0.52 | 0.78 | 23% | 1.00 | 23,773.51 |  |
| 2014 | -0.25 | 0.95 | -1.28 | 0.68 | 0.70 | 28% | 1.00 | 23,336.33 |  |
| 2015 | 0.22 | 0.95 | -0.83 | 1.21 | 0.67 | 27% | 1.00 | 23,777.30 |  |
| 2016 | 1.09 | 0.95 | 0.26 | 1.90 | 1.00 | 0% | 1.00 | 19,806.02 |  |
| 2017 | -0.28 | 0.95 | -1.23 | 0.62 | 0.73 | 27% | 1.00 | 21,092.30 |  |
| 2018 | 0.11 | 0.95 | -0.83 | 1.02 | 0.59 | 30% | 1.00 | 19,481.16 |  |
| 2019 | 0.28 | 0.95 | -0.62 | 1.12 | 0.73 | 28% | 1.00 | 18,979.64 |  |
| 2020 | 0.11 | 0.95 | -0.80 | 1.00 | 0.60 | 32% | 1.00 | 21,014.99 |  |
| 2021 | 0.51 | 0.95 | -0.32 | 1.33 | 0.89 | 18% | 1.00 | 18,898.22 |  |
| ELPD |  |  |  |  |  |  |  |  | -286.41 |
| LOOIC |  |  |  |  |  |  |  |  | 572.82 |
| WAIC |  |  |  |  |  |  |  |  | 572.47 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

Table 5: Full description of model fit for the effect of five-year impact factor on code availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with year (formula: comp\_mthds\_avail ~ year). The model included abbreviation and assignee as random effects (formula: list(~1 | abbreviation, ~1 | assignee)). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), student\_t (location = 0.00, scale = 2.50) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 1.54 | 0.95 | -0.45 | 3.54 | 0.94 | 5% | 1.00 | 13,682.75 |  |
| Intercept[2] | 1.93 | 0.95 | -0.08 | 3.95 | 0.97 | 2% | 1.00 | 14,594.99 |  |
| IF\_5year | 0.45 | 0.95 | -0.05 | 1.04 | 0.96 | 12% | 1.00 | 13,935.20 |  |
| ELPD |  |  |  |  |  |  |  |  | -32.04 |
| LOOIC |  |  |  |  |  |  |  |  | 64.08 |
| WAIC |  |  |  |  |  |  |  |  | 62.86 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

Table 6: Full description of model fit for the effect of five year impact factor on data availability. We fitted a Bayesian logistic mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with year (formula: comp\_mthds\_avail ~ year). The model included abbreviation and assignee as random effects (formula: list(~1 | abbreviation, ~1 | assignee)). Priors over parameters were set as normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), normal (mean = 0.00, SD = 1.00), student\_t (location = 0.00, scale = 2.50) and student\_t (location = 0.00, scale = 2.50) distributions.

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Intercept[1] | 0.86 | 0.95 | -0.45 | 2.03 | 0.90 | 11% | 1.00 | 4,068.28 |  |
| Intercept[2] | 1.12 | 0.95 | -0.20 | 2.28 | 0.95 | 6% | 1.00 | 4,109.16 |  |
| Intercept[3] | 1.55 | 0.95 | 0.23 | 2.73 | 0.99 | 0% | 1.00 | 4,188.23 |  |
| IF\_5year | 0.15 | 0.95 | -0.00 | 0.30 | 0.97 | 67% | 1.00 | 14,822.60 |  |
| ELPD |  |  |  |  |  |  |  |  | -295.85 |
| LOOIC |  |  |  |  |  |  |  |  | 591.71 |
| WAIC |  |  |  |  |  |  |  |  | 591.70 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

## Supplementary Figures

![Figure 1: Criteria scores for 450 articles computational materials and data availability for each of the five evaluators. Each article was evaluated on a 0 to 3 scale for computational materials (Code) and raw data availability (Data) by one of five evaluators.](data:application/eps;base64,)

Figure 1: Criteria scores for 450 articles computational materials and data availability for each of the five evaluators. Each article was evaluated on a 0 to 3 scale for computational materials (Code) and raw data availability (Data) by one of five evaluators.

![Figure 2: Equivalence test for a model testing the effect of the publishing journal on articles’ supporting code availability.](data:application/eps;base64,)

Figure 2: Equivalence test for a model testing the effect of the publishing journal on articles’ supporting code availability.

![Figure 3: Equivalence test for a model testing the effect of the publishing journal on articles’ supporting data availability.](data:application/eps;base64,)

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![Figure 4: Equivalence test for a model testing the effect of the year of publication title on articles’ supporting code availability.](data:application/eps;base64,)

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![Figure 5: Equivalence test for a model testing the effect of the year of publication on articles’ supporting data availability.](data:application/eps;base64,)

Figure 5: Equivalence test for a model testing the effect of the year of publication on articles’ supporting data availability.

![Figure 6: Equivalence test for a model testing the effect of the publishing journal’s five-year impact factor on articles’ supporting code availability.](data:application/eps;base64,)

Figure 6: Equivalence test for a model testing the effect of the publishing journal’s five-year impact factor on articles’ supporting code availability.

![Figure 7: Equivalence test for a model testing the effect of the year of publication on articles’ supporting data availability.](data:application/eps;base64,)

Figure 7: Equivalence test for a model testing the effect of the year of publication on articles’ supporting data availability.