Supplementary Materials for Openness and Computational Reproducibility in Plant Pathology: Where do we Stand and a Way Forward

# Supplementary Materials

## Journal Publication Model Reports

### Computational Methods

![](data:None;base64,)

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

### Data

![](data:None;base64,)

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

## Year

### Computational Methods

![](data:None;base64,)

**Figure S**: Equivalence test for a model testing the effect of the year of publication title on articles’ supporting code availability.

### Data

![](data:None;base64,)

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

## Five-year Impact Factor

### Computational Methods

![](data:None;base64,)

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

### Data

![](data:None;base64,)

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

## Tables

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| abbreviationAustralasPlantPath | -0.12 | 0.95 | -1.99 | 1.67 | 0.55 | 16% | 1.00 | 36,025.85 |  |
| abbreviationCanJPlantPathol | -0.18 | 0.95 | -2.03 | 1.53 | 0.58 | 16% | 1.00 | 37,983.39 |  |
| abbreviationCropProt | -0.22 | 0.95 | -2.09 | 1.47 | 0.60 | 16% | 1.00 | 38,553.81 |  |
| abbreviationEurJPlantPathol | -0.17 | 0.95 | -2.04 | 1.57 | 0.58 | 16% | 1.00 | 41,383.99 |  |
| abbreviationForestPathol | -0.20 | 0.95 | -2.02 | 1.53 | 0.58 | 16% | 1.00 | 36,796.45 |  |
| abbreviationJGenPlantPathol | -0.20 | 0.95 | -2.06 | 1.50 | 0.59 | 17% | 1.00 | 37,913.57 |  |
| abbreviationJPhytopathol | -0.19 | 0.95 | -2.06 | 1.58 | 0.59 | 17% | 1.00 | 38,916.18 |  |
| abbreviationJPlantPathol | -0.20 | 0.95 | -2.02 | 1.50 | 0.58 | 17% | 1.00 | 35,623.96 |  |
| abbreviationMolPlantMicroIn | 0.50 | 0.95 | -1.23 | 2.07 | 0.72 | 14% | 1.00 | 37,427.70 |  |
| abbreviationMolPlantPathol | -0.25 | 0.95 | -2.08 | 1.38 | 0.61 | 17% | 1.00 | 38,198.18 |  |
| abbreviationNematology | -0.20 | 0.95 | -2.02 | 1.49 | 0.58 | 16% | 1.00 | 37,272.03 |  |
| abbreviationPhysiolMolPlantP | -0.22 | 0.95 | -2.05 | 1.44 | 0.59 | 17% | 1.00 | 38,035.36 |  |
| abbreviationPhytoparasitica | -0.22 | 0.95 | -2.05 | 1.43 | 0.60 | 17% | 1.00 | 34,703.53 |  |
| abbreviationPhytopatholMediterr | -0.18 | 0.95 | -2.03 | 1.57 | 0.58 | 16% | 1.00 | 36,784.02 |  |
| abbreviationPlantDis | -0.16 | 0.95 | -2.04 | 1.54 | 0.57 | 16% | 1.00 | 42,138.27 |  |
| abbreviationPlantHealthProgress | -0.15 | 0.95 | -2.02 | 1.58 | 0.56 | 16% | 1.00 | 33,678.96 |  |
| abbreviationPlantPathol | -0.23 | 0.95 | -2.05 | 1.42 | 0.60 | 16% | 1.00 | 37,375.57 |  |
| abbreviationRevMexFitopatol | -0.23 | 0.95 | -2.04 | 1.44 | 0.60 | 17% | 1.00 | 35,845.51 |  |
| abbreviationTropPlantPathol | 0.67 | 0.95 | -1.14 | 2.30 | 0.78 | 13% | 1.00 | 35,972.47 |  |
| abbreviationVirolJ | -0.14 | 0.95 | -2.02 | 1.61 | 0.56 | 16% | 1.00 | 38,296.16 |  |
| ELPD |  |  |  |  |  |  |  |  | -33.90 |
| LOOIC |  |  |  |  |  |  |  |  | 67.80 |
| WAIC |  |  |  |  |  |  |  |  | 66.63 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| abbreviationAustralasPlantPath | 0.57 | 0.95 | -0.73 | 1.76 | 0.81 | 16% | 1.00 | 31,872.73 |  |
| abbreviationCanJPlantPathol | 0.25 | 0.95 | -0.87 | 1.27 | 0.67 | 25% | 1.00 | 27,436.43 |  |
| abbreviationCropProt | -1.26 | 0.95 | -2.74 | -0.02 | 0.98 | 2% | 1.00 | 31,640.89 |  |
| abbreviationEurJPlantPathol | 0.04 | 0.95 | -1.15 | 1.11 | 0.53 | 26% | 1.00 | 29,563.79 |  |
| abbreviationForestPathol | -0.11 | 0.95 | -1.27 | 0.94 | 0.57 | 26% | 1.00 | 30,080.82 |  |
| abbreviationJGenPlantPathol | 0.08 | 0.95 | -1.03 | 1.08 | 0.56 | 28% | 1.00 | 30,193.09 |  |
| abbreviationJPhytopathol | -0.78 | 0.95 | -2.13 | 0.37 | 0.90 | 12% | 1.00 | 29,513.00 |  |
| abbreviationJPlantPathol | 0.15 | 0.95 | -0.96 | 1.15 | 0.62 | 27% | 1.00 | 27,619.26 |  |
| abbreviationMolPlantMicroIn | 0.67 | 0.95 | -0.28 | 1.57 | 0.92 | 11% | 1.00 | 25,378.34 |  |
| abbreviationMolPlantPathol | 0.97 | 0.95 | 0.18 | 1.73 | 0.99 | 0% | 1.00 | 22,969.84 |  |
| abbreviationNematology | -0.21 | 0.95 | -1.50 | 0.94 | 0.64 | 24% | 1.00 | 30,495.20 |  |
| abbreviationPhysiolMolPlantP | 0.55 | 0.95 | -0.39 | 1.42 | 0.88 | 16% | 1.00 | 25,478.13 |  |
| abbreviationPhytoparasitica | -0.22 | 0.95 | -1.34 | 0.79 | 0.66 | 26% | 1.00 | 29,338.27 |  |
| abbreviationPhytopatholMediterr | 1.25 | 0.95 | 0.32 | 2.15 | 1.00 | 0% | 1.00 | 26,733.65 |  |
| abbreviationPlantDis | -1.27 | 0.95 | -2.75 | -0.04 | 0.98 | 2% | 1.00 | 30,678.73 |  |
| abbreviationPlantHealthProgress | -0.63 | 0.95 | -2.06 | 0.57 | 0.84 | 15% | 1.00 | 31,158.68 |  |
| abbreviationPlantPathol | -0.08 | 0.95 | -1.08 | 0.84 | 0.57 | 31% | 1.00 | 24,985.53 |  |
| abbreviationRevMexFitopatol | -1.17 | 0.95 | -2.65 | 0.11 | 0.96 | 5% | 1.00 | 29,483.85 |  |
| abbreviationTropPlantPathol | 0.33 | 0.95 | -0.80 | 1.36 | 0.72 | 22% | 1.00 | 28,405.58 |  |
| abbreviationVirolJ | 0.84 | 0.95 | -0.06 | 1.71 | 0.97 | 5% | 1.00 | 24,480.93 |  |
| ELPD |  |  |  |  |  |  |  |  | -299.17 |
| LOOIC |  |  |  |  |  |  |  |  | 598.33 |
| WAIC |  |  |  |  |  |  |  |  | 598.19 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| year2013 | -0.26 | 0.95 | -2.11 | 1.43 | 0.62 | 16% | 1.00 | 32,516.49 |  |
| year2014 | -0.27 | 0.95 | -2.06 | 1.40 | 0.62 | 16% | 1.00 | 29,225.82 |  |
| year2015 | 0.39 | 0.95 | -1.30 | 1.99 | 0.68 | 16% | 1.00 | 33,527.04 |  |
| year2016 | 0.46 | 0.95 | -1.25 | 2.05 | 0.71 | 15% | 1.00 | 31,169.80 |  |
| year2017 | -0.30 | 0.95 | -2.10 | 1.41 | 0.63 | 16% | 1.00 | 29,319.49 |  |
| year2018 | -0.27 | 0.95 | -2.08 | 1.43 | 0.63 | 17% | 1.00 | 29,253.93 |  |
| year2019 | 0.81 | 0.95 | -0.74 | 2.25 | 0.85 | 11% | 1.00 | 29,977.03 |  |
| year2020 | -0.29 | 0.95 | -2.09 | 1.33 | 0.63 | 17% | 1.00 | 29,489.60 |  |
| year2021 | 0.37 | 0.95 | -1.32 | 1.96 | 0.67 | 16% | 1.00 | 28,456.74 |  |
| ELPD |  |  |  |  |  |  |  |  | -31.95 |
| LOOIC |  |  |  |  |  |  |  |  | 63.90 |
| WAIC |  |  |  |  |  |  |  |  | 62.44 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| year2013 | -0.23 | 0.95 | -1.20 | 0.67 | 0.69 | 29% | 1.00 | 21,139.07 |  |
| year2014 | -0.13 | 0.95 | -1.11 | 0.76 | 0.62 | 31% | 1.00 | 21,628.28 |  |
| year2015 | 0.36 | 0.95 | -0.66 | 1.29 | 0.77 | 23% | 1.00 | 22,319.48 |  |
| year2016 | 0.97 | 0.95 | 0.16 | 1.75 | 0.99 | 0% | 1.00 | 18,342.51 |  |
| year2017 | -0.19 | 0.95 | -1.15 | 0.70 | 0.66 | 29% | 1.00 | 19,176.68 |  |
| year2018 | 0.15 | 0.95 | -0.79 | 1.07 | 0.62 | 30% | 1.00 | 18,328.11 |  |
| year2019 | 0.24 | 0.95 | -0.65 | 1.08 | 0.70 | 29% | 1.00 | 19,464.33 |  |
| year2020 | 0.15 | 0.95 | -0.73 | 0.98 | 0.63 | 32% | 1.00 | 18,569.06 |  |
| year2021 | 0.58 | 0.95 | -0.23 | 1.37 | 0.92 | 14% | 1.00 | 17,116.26 |  |
| ELPD |  |  |  |  |  |  |  |  | -302.82 |
| LOOIC |  |  |  |  |  |  |  |  | 605.63 |
| WAIC |  |  |  |  |  |  |  |  | 605.35 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IF\_5year | 0.46 | 0.95 | -0.05 | 1.03 | 0.96 | 13% | 1.00 | 15,310.55 |  |
| ELPD |  |  |  |  |  |  |  |  | -32.20 |
| LOOIC |  |  |  |  |  |  |  |  | 64.40 |
| WAIC |  |  |  |  |  |  |  |  | 62.92 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table S**: 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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IF\_5year | 0.19 | 0.95 | 0.04 | 0.34 | 0.99 | 48% | 1.00 | 14,202.68 |  |
| ELPD |  |  |  |  |  |  |  |  | -307.03 |
| LOOIC |  |  |  |  |  |  |  |  | 614.06 |
| WAIC |  |  |  |  |  |  |  |  | 614.05 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |