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

We fitted a Bayesian probit 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 and year as random effects (formula: list(~1 | assignee, ~1 | year)). 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), student\_t (location = 0.00, scale = 2.50) and student\_t (location = 0.00, scale = 2.50) distributions. The model’s explanatory power is weak (R2 = 0.10, 95% CI [8.18e-03, 0.23]) and the part related to the fixed effects alone (marginal R2) is of 0.44 (95% CI [0.05, 0.49]). Within this model:

* The effect of b Intercept[1] (Median = 0.61, 95% CI [-1.12, 2.39]) has a 74.46% probability of being positive (> 0), 72.62% of being significant (> 0.05), and 62.74% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22582)
* The effect of b Intercept[2] (Median = 0.78, 95% CI [-0.93, 2.55]) has a 80.31% probability of being positive (> 0), 78.61% of being significant (> 0.05), and 69.95% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 23919)
* The effect of b abbreviationAustralasPlantPath (Median = -0.22, 95% CI [-2.05, 1.32]) has a 59.92% probability of being negative (< 0), 57.84% of being significant (< -0.05), and 46.27% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22097)
* The effect of b abbreviationCanJPlantPathol (Median = -0.36, 95% CI [-2.07, 0.99]) has a 68.47% probability of being negative (< 0), 66.02% of being significant (< -0.05), and 53.14% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22342)
* The effect of b abbreviationCropProt (Median = -0.38, 95% CI [-2.06, 0.92]) has a 70.03% probability of being negative (< 0), 67.68% of being significant (< -0.05), and 54.34% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21663)
* The effect of b abbreviationEurJPlantPathol (Median = -0.41, 95% CI [-2.10, 0.95]) has a 70.42% probability of being negative (< 0), 68.06% of being significant (< -0.05), and 55.56% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 23056)
* The effect of b abbreviationForestPathol (Median = -0.37, 95% CI [-2.10, 0.99]) has a 68.84% probability of being negative (< 0), 66.33% of being significant (< -0.05), and 53.61% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22700)
* The effect of b abbreviationJGenPlantPathol (Median = -0.35, 95% CI [-2.04, 0.97]) has a 68.56% probability of being negative (< 0), 66.05% of being significant (< -0.05), and 52.72% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 23878)
* The effect of b abbreviationJPhytopathol (Median = -0.38, 95% CI [-2.10, 0.97]) has a 69.17% probability of being negative (< 0), 66.76% of being significant (< -0.05), and 53.85% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20556)
* The effect of b abbreviationJPlantPathol (Median = -0.40, 95% CI [-2.06, 0.92]) has a 70.97% probability of being negative (< 0), 68.33% of being significant (< -0.05), and 55.17% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22169)
* The effect of b abbreviationMolPlantMicroIn (Median = 0.39, 95% CI [-0.78, 1.41]) has a 75.71% probability of being positive (> 0), 72.78% of being significant (> 0.05), and 56.34% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22250)
* The effect of b abbreviationMolPlantPathol (Median = -0.43, 95% CI [-2.08, 0.86]) has a 72.29% probability of being negative (< 0), 69.91% of being significant (< -0.05), and 56.93% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21610)
* The effect of b abbreviationNematology (Median = -0.40, 95% CI [-2.09, 0.95]) has a 70.81% probability of being negative (< 0), 68.25% of being significant (< -0.05), and 55.53% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 23019)
* The effect of b abbreviationPhysiolMolPlantP (Median = -0.40, 95% CI [-2.11, 0.92]) has a 70.83% probability of being negative (< 0), 68.25% of being significant (< -0.05), and 55.80% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21850)
* The effect of b abbreviationPhytoparasitica (Median = -0.45, 95% CI [-2.11, 0.84]) has a 73.13% probability of being negative (< 0), 70.69% of being significant (< -0.05), and 57.75% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21709)
* The effect of b abbreviationPhytopatholMediterr (Median = -0.41, 95% CI [-2.07, 0.93]) has a 71.00% probability of being negative (< 0), 68.53% of being significant (< -0.05), and 55.66% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 22981)
* The effect of b abbreviationPlantDis (Median = -0.37, 95% CI [-2.02, 0.96]) has a 69.17% probability of being negative (< 0), 66.61% of being significant (< -0.05), and 53.31% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20004)
* The effect of b abbreviationPlantHealthProgress (Median = -0.40, 95% CI [-2.05, 0.95]) has a 69.94% probability of being negative (< 0), 67.47% of being significant (< -0.05), and 55.17% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21588)
* The effect of b abbreviationPlantPathol (Median = -0.40, 95% CI [-2.07, 0.90]) has a 70.97% probability of being negative (< 0), 68.53% of being significant (< -0.05), and 55.40% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20812)
* The effect of b abbreviationRevMexFitopatol (Median = -0.36, 95% CI [-2.08, 1.02]) has a 68.08% probability of being negative (< 0), 65.72% of being significant (< -0.05), and 52.94% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21959)
* The effect of b abbreviationTropPlantPathol (Median = 0.62, 95% CI [-0.60, 1.71]) has a 84.97% probability of being positive (> 0), 82.84% of being significant (> 0.05), and 70.49% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 3729)
* The effect of b abbreviationVirolJ (Median = -0.38, 95% CI [-2.06, 0.97]) has a 68.88% probability of being negative (< 0), 66.27% of being significant (< -0.05), and 53.73% of being large (< -0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 3764)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

### Data

We fitted a Bayesian probit mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict data\_avail with abbreviation (formula: data\_avail ~ abbreviation). The model included assignee and year as random effects (formula: list(~1 | assignee, ~1 | year)). 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), 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. The model’s explanatory power is moderate (R2 = 0.14, 95% CI [0.09, 0.20]) and the part related to the fixed effects alone (marginal R2) is of 0.15 (95% CI [0.04, 0.30]). Within this model:

* The effect of b Intercept[1] (Median = 0.72, 95% CI [-0.53, 1.41]) has a 88.56% probability of being positive (> 0), 87.12% of being significant (> 0.05), and 77.51% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 15605)
* The effect of b Intercept[2] (Median = 0.91, 95% CI [-0.32, 1.60]) has a 93.41% probability of being positive (> 0), 92.31% of being significant (> 0.05), and 85.22% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 13121)
* The effect of b Intercept[3] (Median = 1.20, 95% CI [-0.04, 1.89]) has a 97.17% probability of being positive (> 0), 96.72% of being significant (> 0.05), and 93.11% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 19462)
* The effect of b abbreviationAustralasPlantPath (Median = 0.51, 95% CI [-0.33, 1.31]) has a 88.27% probability of being positive (> 0), 85.93% of being significant (> 0.05), and 68.36% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 14100)
* The effect of b abbreviationCanJPlantPathol (Median = 0.25, 95% CI [-0.47, 0.91]) has a 75.47% probability of being positive (> 0), 70.80% of being significant (> 0.05), and 43.86% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 14549)
* The effect of b abbreviationCropProt (Median = -1.18, 95% CI [-2.52, -0.19]) has a 99.20% probability of being negative (< 0), 98.91% of being significant (< -0.05), and 95.61% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 11816)
* The effect of b abbreviationEurJPlantPathol (Median = 0.08, 95% CI [-0.67, 0.78]) has a 58.84% probability of being positive (> 0), 53.45% of being significant (> 0.05), and 27.24% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 17622)
* The effect of b abbreviationForestPathol (Median = -0.10, 95% CI [-0.86, 0.60]) has a 61.10% probability of being negative (< 0), 55.72% of being significant (< -0.05), and 30.11% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 12335)
* The effect of b abbreviationJGenPlantPathol (Median = 0.16, 95% CI [-0.50, 0.79]) has a 68.76% probability of being positive (> 0), 63.28% of being significant (> 0.05), and 33.82% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 11342)
* The effect of b abbreviationJPhytopathol (Median = -0.61, 95% CI [-1.56, 0.20]) has a 92.86% probability of being negative (< 0), 90.94% of being significant (< -0.05), and 76.42% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9591)
* The effect of b abbreviationJPlantPathol (Median = 0.13, 95% CI [-0.56, 0.77]) has a 64.06% probability of being positive (> 0), 58.74% of being significant (> 0.05), and 30.15% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 15350)
* The effect of b abbreviationMolPlantMicroIn (Median = 0.41, 95% CI [-0.22, 1.02]) has a 90.50% probability of being positive (> 0), 87.46% of being significant (> 0.05), and 63.54% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10934)
* The effect of b abbreviationMolPlantPathol (Median = 0.62, 95% CI [0.08, 1.17]) has a 98.77% probability of being positive (> 0), 98.12% of being significant (> 0.05), and 88.17% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 12739)
* The effect of b abbreviationNematology (Median = -0.13, 95% CI [-0.99, 0.64]) has a 62.26% probability of being negative (< 0), 57.39% of being significant (< -0.05), and 33.72% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 11563)
* The effect of b abbreviationPhysiolMolPlantP (Median = 0.36, 95% CI [-0.26, 0.95]) has a 87.31% probability of being positive (> 0), 83.61% of being significant (> 0.05), and 56.93% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 19437)
* The effect of b abbreviationPhytoparasitica (Median = -0.12, 95% CI [-0.83, 0.55]) has a 63.31% probability of being negative (< 0), 57.70% of being significant (< -0.05), and 30.61% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 16873)
* The effect of b abbreviationPhytopatholMediterr (Median = 0.80, 95% CI [0.17, 1.42]) has a 99.45% probability of being positive (> 0), 99.12% of being significant (> 0.05), and 94.11% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10933)
* The effect of b abbreviationPlantDis (Median = -1.18, 95% CI [-2.55, -0.19]) has a 99.23% probability of being negative (< 0), 98.87% of being significant (< -0.05), and 95.69% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 21625)
* The effect of b abbreviationPlantHealthProgress (Median = -0.43, 95% CI [-1.39, 0.40]) has a 84.37% probability of being negative (< 0), 81.31% of being significant (< -0.05), and 62.30% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 13518)
* The effect of b abbreviationPlantPathol (Median = -0.08, 95% CI [-0.73, 0.51]) has a 60.88% probability of being negative (< 0), 54.64% of being significant (< -0.05), and 25.25% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10495)
* The effect of b abbreviationRevMexFitopatol (Median = -1.11, 95% CI [-2.47, -0.09]) has a 98.56% probability of being negative (< 0), 98.03% of being significant (< -0.05), and 93.53% of being large (< -0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4350)
* The effect of b abbreviationTropPlantPathol (Median = 0.27, 95% CI [-0.44, 0.94]) has a 77.85% probability of being positive (> 0), 73.17% of being significant (> 0.05), and 46.43% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4398)
* The effect of b abbreviationVirolJ (Median = 0.50, 95% CI [-0.09, 1.08]) has a 95.30% probability of being positive (> 0), 93.54% of being significant (> 0.05), and 74.81% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4452)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

## Year

### Computational Methods

We fitted a Bayesian probit 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. The model’s explanatory power is moderate (R2 = 0.14, 95% CI [0.01, 0.33]) and the part related to the fixed effects alone (marginal R2) is of 0.46 (95% CI [0.07, 0.50]). Within this model:

* The effect of b Intercept[1] (Median = 0.70, 95% CI [-0.92, 2.63]) has a 79.75% probability of being positive (> 0), 77.95% of being significant (> 0.05), and 68.28% of being large (> 0.30). The estimation successfully converged (Rhat = 1.002) and the indices are reliable (ESS = 6053)
* The effect of b Intercept[2] (Median = 0.91, 95% CI [-0.71, 2.82]) has a 86.11% probability of being positive (> 0), 84.69% of being significant (> 0.05), and 76.60% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 6352)
* The effect of b year2013 (Median = -0.30, 95% CI [-2.03, 1.14]) has a 64.81% probability of being negative (< 0), 62.43% of being significant (< -0.05), and 49.90% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 19519)
* The effect of b year2014 (Median = -0.32, 95% CI [-2.00, 1.08]) has a 66.53% probability of being negative (< 0), 64.04% of being significant (< -0.05), and 51.09% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20840)
* The effect of b year2015 (Median = 0.54, 95% CI [-0.73, 1.72]) has a 80.81% probability of being positive (> 0), 78.51% of being significant (> 0.05), and 64.92% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 18234)
* The effect of b year2016 (Median = 0.70, 95% CI [-0.52, 1.88]) has a 86.81% probability of being positive (> 0), 85.21% of being significant (> 0.05), and 74.06% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 16693)
* The effect of b year2017 (Median = -0.37, 95% CI [-2.06, 0.99]) has a 69.26% probability of being negative (< 0), 66.72% of being significant (< -0.05), and 53.64% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20071)
* The effect of b year2018 (Median = -0.36, 95% CI [-2.06, 1.03]) has a 68.26% probability of being negative (< 0), 65.86% of being significant (< -0.05), and 53.15% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 19957)
* The effect of b year2019 (Median = 0.84, 95% CI [-0.21, 1.88]) has a 94.16% probability of being positive (> 0), 93.08% of being significant (> 0.05), and 84.34% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 16260)
* The effect of b year2020 (Median = -0.35, 95% CI [-2.01, 1.01]) has a 68.12% probability of being negative (< 0), 65.74% of being significant (< -0.05), and 52.72% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 20106)
* The effect of b year2021 (Median = 0.52, 95% CI [-0.70, 1.68]) has a 80.19% probability of being positive (> 0), 77.71% of being significant (> 0.05), and 64.00% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 16096)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

### Data

We fitted a Bayesian probit mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict data\_avail with year (formula: data\_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), 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. The model’s explanatory power is weak (R2 = 0.13, 95% CI [0.06, 0.19]) and the part related to the fixed effects alone (marginal R2) is of 0.05 (95% CI [4.69e-03, 0.12]). Within this model:

* The effect of b Intercept[1] (Median = 0.91, 95% CI [-0.29, 1.64]) has a 93.83% probability of being positive (> 0), 93.02% of being significant (> 0.05), and 86.39% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4773)
* The effect of b Intercept[2] (Median = 1.10, 95% CI [-0.09, 1.83]) has a 96.62% probability of being positive (> 0), 96.08% of being significant (> 0.05), and 91.80% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4782)
* The effect of b Intercept[3] (Median = 1.38, 95% CI [0.19, 2.12]) has a 98.78% probability of being positive (> 0), 98.51% of being significant (> 0.05), and 96.50% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 4805)
* The effect of b year2013 (Median = -0.02, 95% CI [-0.61, 0.56]) has a 53.26% probability of being negative (< 0), 46.37% of being significant (< -0.05), and 17.36% of being large (< -0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10605)
* The effect of b year2014 (Median = 0.03, 95% CI [-0.56, 0.61]) has a 54.22% probability of being positive (> 0), 47.91% of being significant (> 0.05), and 17.94% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 11191)
* The effect of b year2015 (Median = 0.32, 95% CI [-0.31, 0.94]) has a 83.97% probability of being positive (> 0), 79.94% of being significant (> 0.05), and 52.36% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 12267)
* The effect of b year2016 (Median = 0.70, 95% CI [0.17, 1.24]) has a 99.48% probability of being positive (> 0), 99.07% of being significant (> 0.05), and 93.05% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9672)
* The effect of b year2017 (Median = 0.02, 95% CI [-0.59, 0.61]) has a 52.78% probability of being positive (> 0), 46.21% of being significant (> 0.05), and 18.09% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10236)
* The effect of b year2018 (Median = 0.24, 95% CI [-0.36, 0.82]) has a 78.46% probability of being positive (> 0), 73.26% of being significant (> 0.05), and 41.55% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9429)
* The effect of b year2019 (Median = 0.25, 95% CI [-0.30, 0.81]) has a 81.34% probability of being positive (> 0), 76.30% of being significant (> 0.05), and 43.49% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9823)
* The effect of b year2020 (Median = 0.17, 95% CI [-0.39, 0.75]) has a 72.82% probability of being positive (> 0), 66.82% of being significant (> 0.05), and 33.41% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 10042)
* The effect of b year2021 (Median = 0.42, 95% CI [-0.13, 0.96]) has a 93.77% probability of being positive (> 0), 91.25% of being significant (> 0.05), and 67.49% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9031)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

## Five-year Impact Factor

### Computational Methods

We fitted a Bayesian probit mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict comp\_mthds\_avail with IF\_5year (formula: comp\_mthds\_avail ~ IF\_5year). 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) and student\_t (location = 0.00, scale = 2.50) distributions. The model’s explanatory power is weak (R2 = 0.02, 95% CI [1.66e-06, 0.11]) and the part related to the fixed effects alone (marginal R2) is of 0.12 (95% CI [8.96e-09, 0.45]). Within this model:

* The effect of b Intercept[1] (Median = 2.01, 95% CI [0.02, 3.34]) has a 97.59% probability of being positive (> 0), 97.15% of being significant (> 0.05), and 94.83% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 9199)
* The effect of b Intercept[2] (Median = 2.16, 95% CI [0.17, 3.48]) has a 98.41% probability of being positive (> 0), 98.23% of being significant (> 0.05), and 96.54% of being large (> 0.30). The estimation successfully converged (Rhat = 1.003) and the indices are reliable (ESS = 2577)
* The effect of b IF 5year (Median = 0.21, 95% CI [-7.91e-03, 0.45]) has a 96.97% probability of being positive (> 0), 92.27% of being significant (> 0.05), and 21.60% of being large (> 0.30). The estimation successfully converged (Rhat = 1.003) and the indices are reliable (ESS = 2625)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

### Data

We fitted a Bayesian probit mixed model (estimated using MCMC sampling with 4 chains of 10000 iterations and a warmup of 5000) to predict data\_avail with IF\_5year (formula: data\_avail ~ IF\_5year). 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) and student\_t (location = 0.00, scale = 2.50) distributions. The model’s explanatory power is weak (R2 = 0.03, 95% CI [5.17e-03, 0.07]) and the part related to the fixed effects alone (marginal R2) is of 0.01 (95% CI [3.30e-10, 0.05]). Within this model:

* The effect of b Intercept[1] (Median = 1.00, 95% CI [-0.10, 1.56]) has a 96.58% probability of being positive (> 0), 95.97% of being significant (> 0.05), and 91.39% of being large (> 0.30). The estimation successfully converged (Rhat = 1.000) and the indices are reliable (ESS = 16224)
* The effect of b Intercept[2] (Median = 1.17, 95% CI [0.07, 1.74]) has a 98.03% probability of being positive (> 0), 97.67% of being significant (> 0.05), and 94.99% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 3867)
* The effect of b Intercept[3] (Median = 1.43, 95% CI [0.34, 2.00]) has a 99.28% probability of being positive (> 0), 99.10% of being significant (> 0.05), and 97.84% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 3897)
* The effect of b IF 5year (Median = 0.10, 95% CI [0.01, 0.18]) has a 98.87% probability of being positive (> 0), 86.74% of being significant (> 0.05), and 0.00% of being large (> 0.30). The estimation successfully converged (Rhat = 1.001) and the indices are reliable (ESS = 3953)

Following the Sequential Effect eXistence and sIgnificance Testing (SEXIT) framework, we report the median of the posterior distribution and its 95% CI (Highest Density Interval), along the probability of direction (pd), the probability of significance and the probability of being large. The thresholds beyond which the effect is considered as significant (i.e., non-negligible) and large are |0.05| and |0.30|. Convergence and stability of the Bayesian sampling has been assessed using R-hat, which should be below 1.01 (Vehtari et al., 2019), and Effective Sample Size (ESS), which should be greater than 1000 (Burkner, 2017).

## Tables

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| abbreviationAustralasPlantPath | -0.22 | 0.95 | -2.05 | 1.32 | 0.60 | 10% | 1.00 | 22,581.97 |  |
| abbreviationCanJPlantPathol | -0.36 | 0.95 | -2.07 | 0.99 | 0.68 | 10% | 1.00 | 23,919.45 |  |
| abbreviationCropProt | -0.38 | 0.95 | -2.06 | 0.92 | 0.70 | 11% | 1.00 | 22,096.99 |  |
| abbreviationEurJPlantPathol | -0.41 | 0.95 | -2.10 | 0.95 | 0.70 | 10% | 1.00 | 22,342.37 |  |
| abbreviationForestPathol | -0.37 | 0.95 | -2.10 | 0.99 | 0.69 | 10% | 1.00 | 21,662.60 |  |
| abbreviationJGenPlantPathol | -0.35 | 0.95 | -2.04 | 0.97 | 0.69 | 11% | 1.00 | 23,055.60 |  |
| abbreviationJPhytopathol | -0.38 | 0.95 | -2.10 | 0.97 | 0.69 | 10% | 1.00 | 22,699.51 |  |
| abbreviationJPlantPathol | -0.40 | 0.95 | -2.06 | 0.92 | 0.71 | 10% | 1.00 | 23,877.66 |  |
| abbreviationMolPlantMicroIn | 0.39 | 0.95 | -0.78 | 1.41 | 0.76 | 12% | 1.00 | 20,555.88 |  |
| abbreviationMolPlantPathol | -0.43 | 0.95 | -2.08 | 0.86 | 0.72 | 10% | 1.00 | 22,169.22 |  |
| abbreviationNematology | -0.40 | 0.95 | -2.09 | 0.95 | 0.71 | 10% | 1.00 | 22,250.03 |  |
| abbreviationPhysiolMolPlantP | -0.40 | 0.95 | -2.11 | 0.92 | 0.71 | 10% | 1.00 | 21,610.10 |  |
| abbreviationPhytoparasitica | -0.45 | 0.95 | -2.11 | 0.84 | 0.73 | 10% | 1.00 | 23,019.40 |  |
| abbreviationPhytopatholMediterr | -0.41 | 0.95 | -2.07 | 0.93 | 0.71 | 10% | 1.00 | 21,850.20 |  |
| abbreviationPlantDis | -0.37 | 0.95 | -2.02 | 0.96 | 0.69 | 10% | 1.00 | 21,708.59 |  |
| abbreviationPlantHealthProgress | -0.40 | 0.95 | -2.05 | 0.95 | 0.70 | 10% | 1.00 | 22,980.89 |  |
| abbreviationPlantPathol | -0.40 | 0.95 | -2.07 | 0.90 | 0.71 | 10% | 1.00 | 20,003.93 |  |
| abbreviationRevMexFitopatol | -0.36 | 0.95 | -2.08 | 1.02 | 0.68 | 10% | 1.00 | 21,587.62 |  |
| abbreviationTropPlantPathol | 0.62 | 0.95 | -0.60 | 1.71 | 0.85 | 8% | 1.00 | 20,811.68 |  |
| abbreviationVirolJ | -0.38 | 0.95 | -2.06 | 0.97 | 0.69 | 10% | 1.00 | 21,959.32 |  |
| ELPD |  |  |  |  |  |  |  |  | -35.91 |
| LOOIC |  |  |  |  |  |  |  |  | 71.83 |
| WAIC |  |  |  |  |  |  |  |  | 67.90 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| abbreviationAustralasPlantPath | 0.51 | 0.95 | -0.33 | 1.31 | 0.88 | 10% | 1.00 | 15,604.61 |  |
| abbreviationCanJPlantPathol | 0.25 | 0.95 | -0.47 | 0.91 | 0.75 | 18% | 1.00 | 13,120.74 |  |
| abbreviationCropProt | -1.18 | 0.95 | -2.52 | -0.19 | 0.99 | 0% | 1.00 | 19,461.79 |  |
| abbreviationEurJPlantPathol | 0.08 | 0.95 | -0.67 | 0.78 | 0.59 | 22% | 1.00 | 14,099.63 |  |
| abbreviationForestPathol | -0.10 | 0.95 | -0.86 | 0.60 | 0.61 | 22% | 1.00 | 14,549.14 |  |
| abbreviationJGenPlantPathol | 0.16 | 0.95 | -0.50 | 0.79 | 0.69 | 22% | 1.00 | 11,816.37 |  |
| abbreviationJPhytopathol | -0.61 | 0.95 | -1.56 | 0.20 | 0.93 | 7% | 1.00 | 17,622.07 |  |
| abbreviationJPlantPathol | 0.13 | 0.95 | -0.56 | 0.77 | 0.64 | 22% | 1.00 | 12,335.45 |  |
| abbreviationMolPlantMicroIn | 0.41 | 0.95 | -0.22 | 1.02 | 0.90 | 11% | 1.00 | 11,342.20 |  |
| abbreviationMolPlantPathol | 0.62 | 0.95 | 0.08 | 1.17 | 0.99 | 0% | 1.00 | 9,590.53 |  |
| abbreviationNematology | -0.13 | 0.95 | -0.99 | 0.64 | 0.62 | 20% | 1.00 | 15,350.50 |  |
| abbreviationPhysiolMolPlantP | 0.36 | 0.95 | -0.26 | 0.95 | 0.87 | 14% | 1.00 | 10,933.55 |  |
| abbreviationPhytoparasitica | -0.12 | 0.95 | -0.83 | 0.55 | 0.63 | 23% | 1.00 | 12,738.99 |  |
| abbreviationPhytopatholMediterr | 0.80 | 0.95 | 0.17 | 1.42 | 0.99 | 0% | 1.00 | 11,563.08 |  |
| abbreviationPlantDis | -1.18 | 0.95 | -2.55 | -0.19 | 0.99 | 0% | 1.00 | 19,437.10 |  |
| abbreviationPlantHealthProgress | -0.43 | 0.95 | -1.39 | 0.40 | 0.84 | 12% | 1.00 | 16,873.36 |  |
| abbreviationPlantPathol | -0.08 | 0.95 | -0.73 | 0.51 | 0.61 | 25% | 1.00 | 10,933.17 |  |
| abbreviationRevMexFitopatol | -1.11 | 0.95 | -2.47 | -0.09 | 0.99 | 0% | 1.00 | 21,625.30 |  |
| abbreviationTropPlantPathol | 0.27 | 0.95 | -0.44 | 0.94 | 0.78 | 17% | 1.00 | 13,518.03 |  |
| abbreviationVirolJ | 0.50 | 0.95 | -0.09 | 1.08 | 0.95 | 7% | 1.00 | 10,495.02 |  |
| ELPD |  |  |  |  |  |  |  |  | -300.85 |
| LOOIC |  |  |  |  |  |  |  |  | 601.70 |
| WAIC |  |  |  |  |  |  |  |  | 600.71 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| year2013 | -0.30 | 0.95 | -2.03 | 1.14 | 0.65 | 10% | 1.00 | 19,518.84 |  |
| year2014 | -0.32 | 0.95 | -2.00 | 1.08 | 0.67 | 10% | 1.00 | 20,839.69 |  |
| year2015 | 0.54 | 0.95 | -0.73 | 1.72 | 0.81 | 9% | 1.00 | 18,233.88 |  |
| year2016 | 0.70 | 0.95 | -0.52 | 1.88 | 0.87 | 7% | 1.00 | 16,692.61 |  |
| year2017 | -0.37 | 0.95 | -2.06 | 0.99 | 0.69 | 11% | 1.00 | 20,071.40 |  |
| year2018 | -0.36 | 0.95 | -2.06 | 1.03 | 0.68 | 10% | 1.00 | 19,956.89 |  |
| year2019 | 0.84 | 0.95 | -0.21 | 1.88 | 0.94 | 5% | 1.00 | 16,259.60 |  |
| year2020 | -0.35 | 0.95 | -2.01 | 1.01 | 0.68 | 10% | 1.00 | 20,105.56 |  |
| year2021 | 0.52 | 0.95 | -0.70 | 1.68 | 0.80 | 10% | 1.00 | 16,095.69 |  |
| ELPD |  |  |  |  |  |  |  |  | -31.44 |
| LOOIC |  |  |  |  |  |  |  |  | 62.88 |
| WAIC |  |  |  |  |  |  |  |  | 58.08 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| year2013 | -0.02 | 0.95 | -0.61 | 0.56 | 0.53 | 28% | 1.00 | 10,604.93 |  |
| year2014 | 0.03 | 0.95 | -0.56 | 0.61 | 0.54 | 27% | 1.00 | 11,190.53 |  |
| year2015 | 0.32 | 0.95 | -0.31 | 0.94 | 0.84 | 16% | 1.00 | 12,266.84 |  |
| year2016 | 0.70 | 0.95 | 0.17 | 1.24 | 0.99 | 0% | 1.00 | 9,672.18 |  |
| year2017 | 0.02 | 0.95 | -0.59 | 0.61 | 0.53 | 27% | 1.00 | 10,235.53 |  |
| year2018 | 0.24 | 0.95 | -0.36 | 0.82 | 0.78 | 20% | 1.00 | 9,429.17 |  |
| year2019 | 0.25 | 0.95 | -0.30 | 0.81 | 0.81 | 20% | 1.00 | 9,822.82 |  |
| year2020 | 0.17 | 0.95 | -0.39 | 0.75 | 0.73 | 24% | 1.00 | 10,041.69 |  |
| year2021 | 0.42 | 0.95 | -0.13 | 0.96 | 0.94 | 9% | 1.00 | 9,030.75 |  |
| ELPD |  |  |  |  |  |  |  |  | -304.08 |
| LOOIC |  |  |  |  |  |  |  |  | 608.16 |
| WAIC |  |  |  |  |  |  |  |  | 607.36 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IF\_5year | 0.21 | 0.95 | -0.01 | 0.45 | 0.97 | 16% | 1.00 | 9,198.61 |  |
| ELPD |  |  |  |  |  |  |  |  | -32.36 |
| LOOIC |  |  |  |  |  |  |  |  | 64.72 |
| WAIC |  |  |  |  |  |  |  |  | 63.14 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |

**Table** :

| Parameter | Median | CI | CI Low | CI High | pd | ROPE % | Rhat | ESS | Fit |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IF\_5year | 0.10 | 0.95 | 0.01 | 0.18 | 0.99 | 52% | 1.00 | 16,223.97 |  |
| ELPD |  |  |  |  |  |  |  |  | -307.39 |
| LOOIC |  |  |  |  |  |  |  |  | 614.78 |
| WAIC |  |  |  |  |  |  |  |  | 614.76 |
| Sigma |  |  |  |  |  |  |  |  | 1.00 |