

Table S3: Results for Homochronous Sampling

| η | Inference | Truth | Mean | Median | Error | Bias | Relative HPD width | 95% HPD accuracy |
|-----------------|----------------|-------|-------|--------|-------|-------|--------------------|------------------|
| \mathcal{R}_0 | Stoch.Coal.SIR | 2.50 | 3.04 | 2.74 | 0.13 | 0.11 | 1.32 | 100.00% |
| | Deter.Coal.SIR | 2.50 | 4.05 | 3.29 | 0.34 | 0.32 | 2.38 | 100.00% |
| | BDSIR | 2.50 | 2.84 | 2.49 | 0.16 | 0.03 | 1.45 | 97.00% |
| γ | Stoch.Coal.SIR | 0.30 | 0.26 | 0.23 | 0.25 | -0.21 | 1.43 | 100.00% |
| | Deter.Coal.SIR | 0.30 | 0.26 | 0.19 | 0.36 | -0.31 | 2.03 | 100.00% |
| | BDSIR | 0.30 | 0.23 | 0.17 | 0.42 | -0.42 | 2.04 | 100.00% |
| $S_{(0)}$ | Stoch.Coal.SIR | 999 | 1660 | 1065 | 0.18 | 0.09 | 4.75 | 100.00% |
| | Deter.Coal.SIR | 999 | 4127 | 679 | 0.78 | 0.09 | 10.24 | 100.00% |
| | BDSIR | 999 | 1907 | 1320 | 0.41 | 0.41 | 4.86 | 100.00% |
| $z_{(0)}$ | Stoch.Coal.SIR | 20.0 | 20.17 | 19.82 | 0.09 | -0.03 | 0.43 | 95.00% |
| | Deter.Coal.SIR | 20.0 | 19.09 | 19.21 | 0.09 | -0.05 | 0.19 | 73.00% |
| | BDSIR | 20.0 | 36.56 | 29.38 | 0.55 | 0.54 | 4.24 | 100.00% |