Supplementary Material

We have presented the bias, RMSE, coverage and efficiency plots for aggregated forecast, $\mathcal{R}_0$, MGI, P_{eff}, and P_{rep}. Here, we are showing the other parameters (G_S, G_P, δ_P and δ_{obs}) and disaggregated forecast (five forecast steps) that are excluded in the main text.
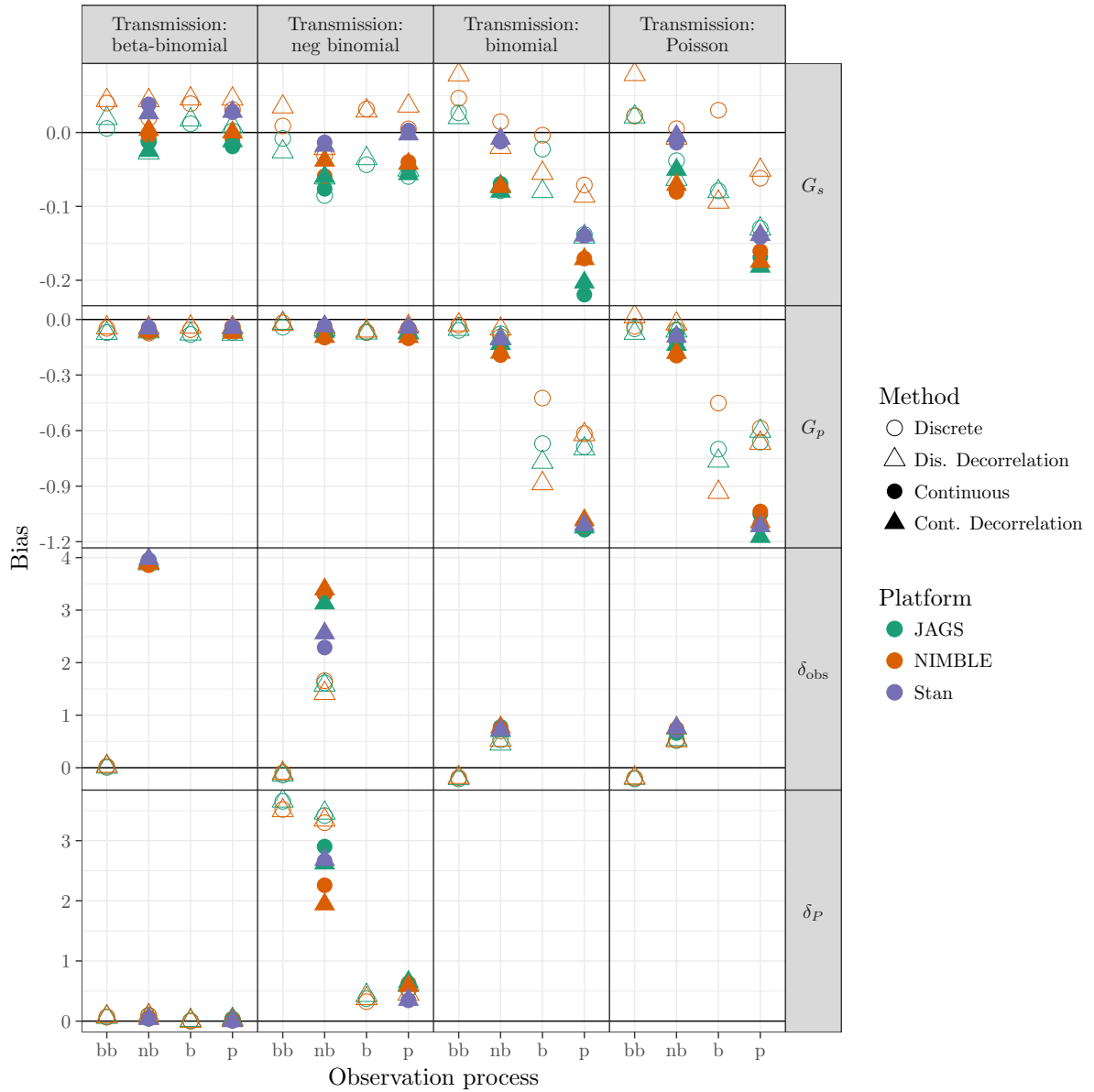
Figure S1: Comparison of bias for G_S, G_P, δ_{obs}, and δ_P described in Sect. 2.2 across different platforms described in Sect. 2.3.1. δ_P is only applicable in models with dispersion in the transmission process (first and second left column panel) and δ_{obs} is only applicable in models with dispersion in the observation process (first and second column within each column panel).

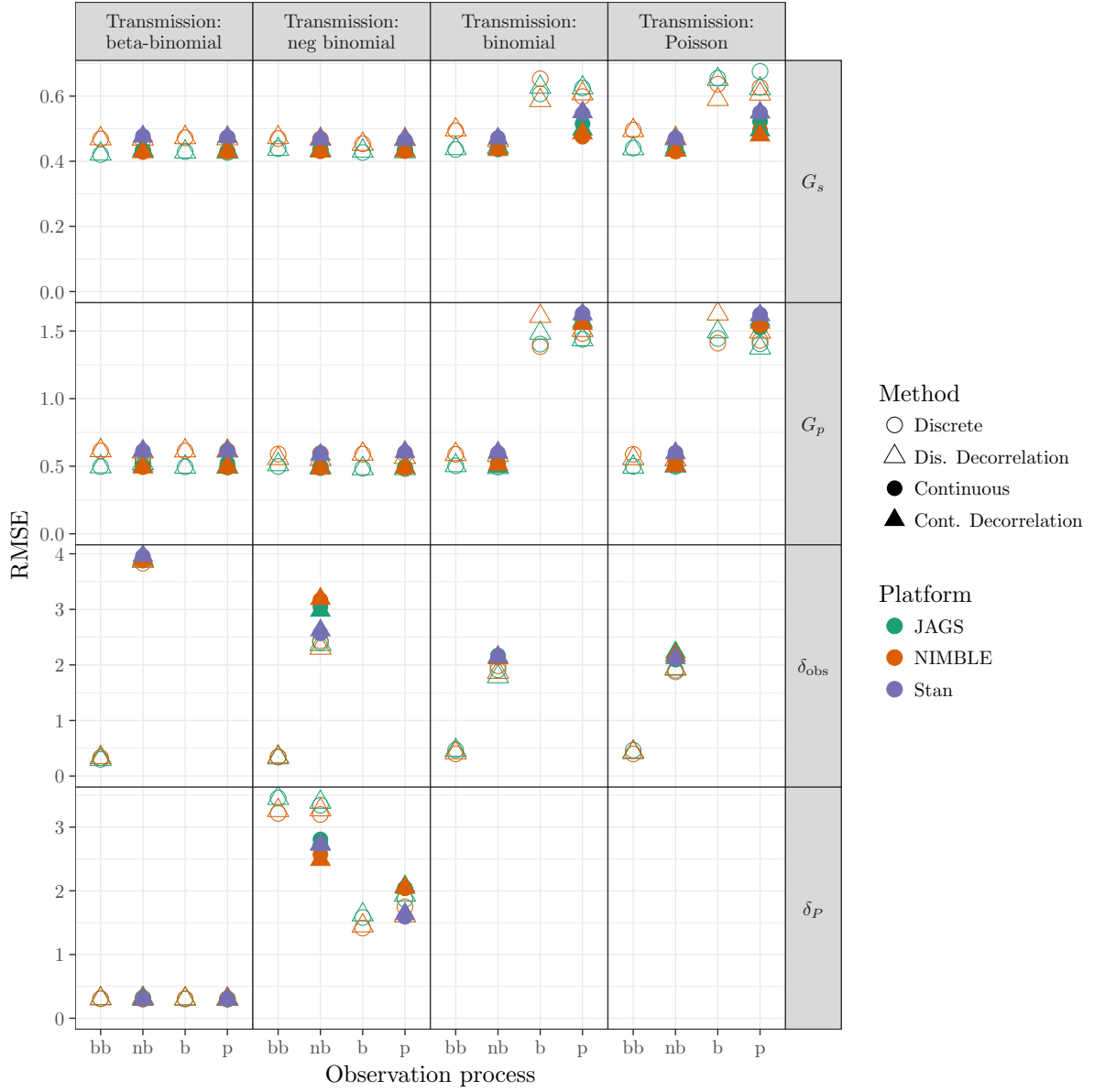Figure S2: Comparison of RMSE for G_S, G_P, δ_{obs}, and δ_P. See Figure 4 in main text and Figure S1 in appendix for details.
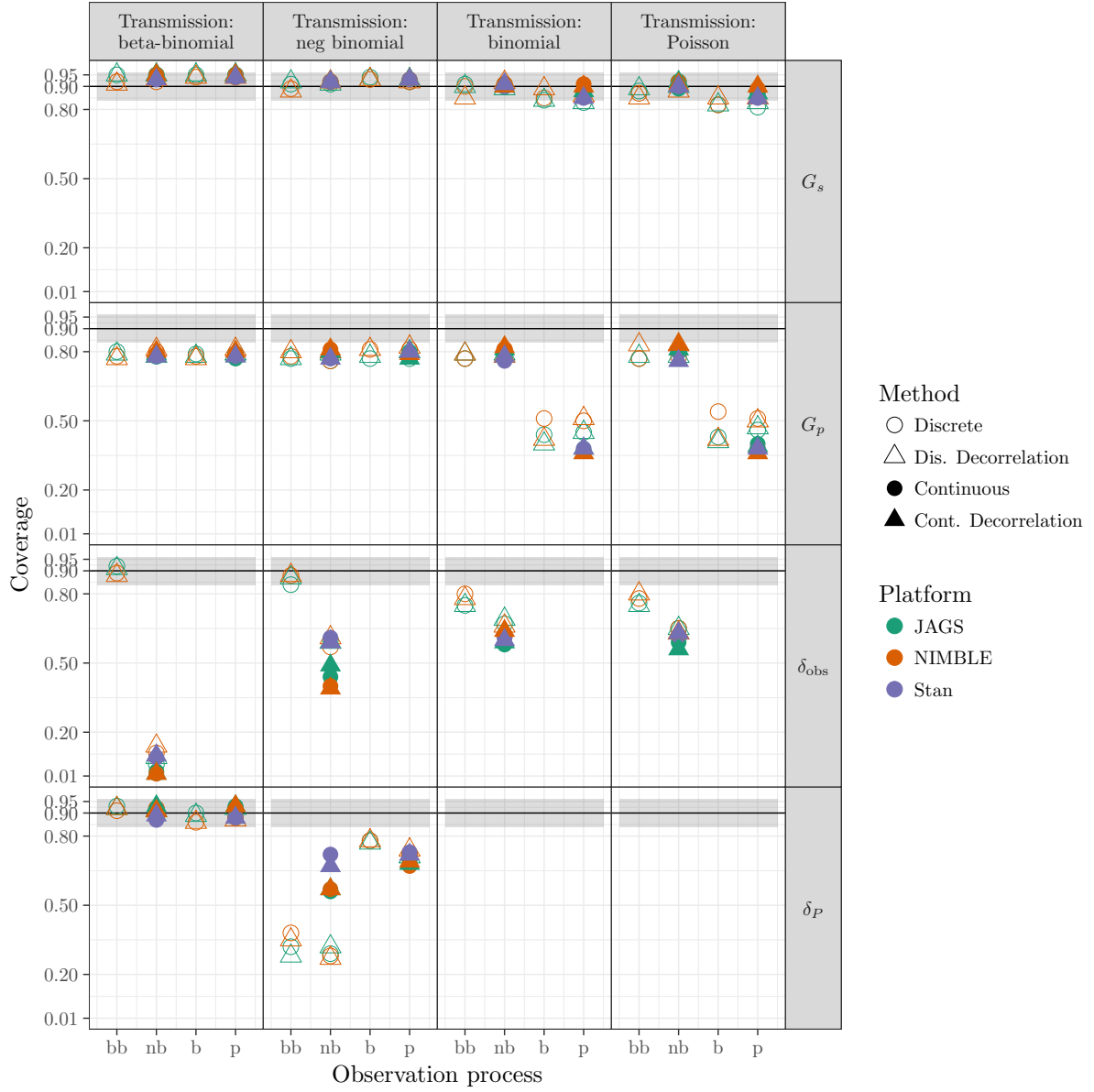
Figure S3: Comparison of coverage for G_S, G_P, δ_{obs}, and δ_P. See Figure 5 in main text and Figure S1 in appendix for details.
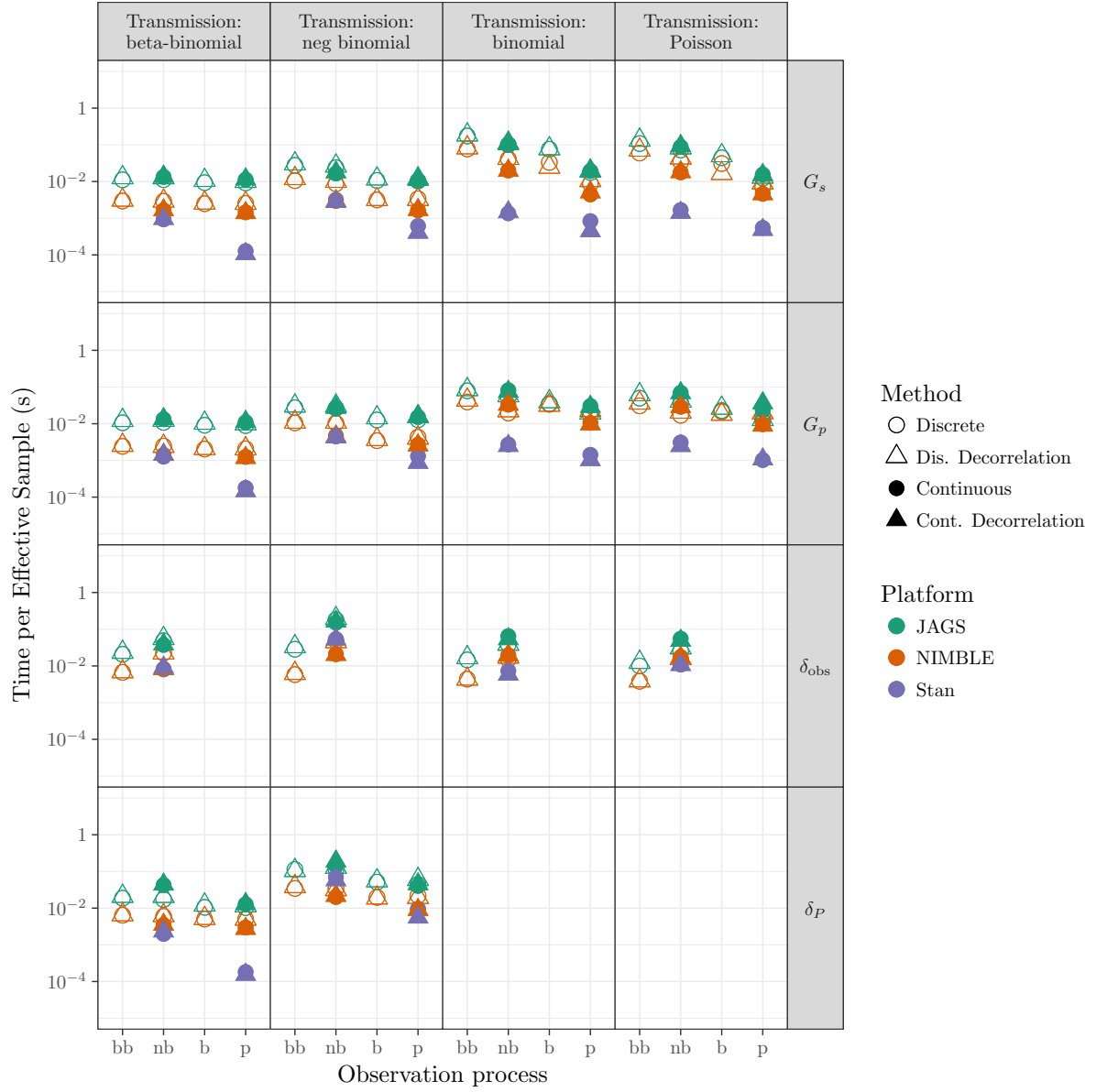
Figure S4: Comparison of coverage for G_S, G_P, δ_{obs}, and δ_P. See Figure Figure 6 in main text and Figure S1 in appendix for details.
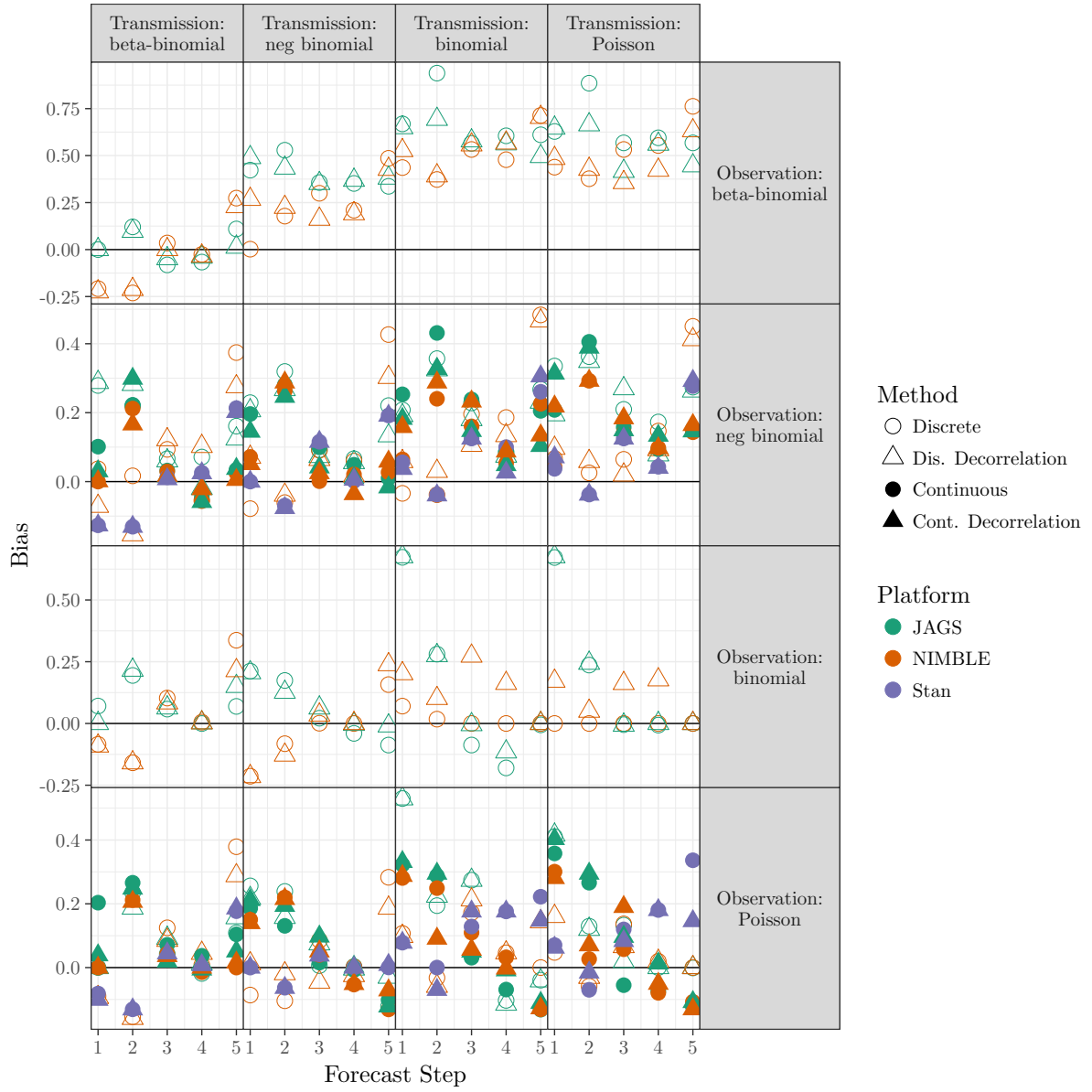
Figure S5: Comparison of bias for five forecast steps described in Sect. 2.2 across different platforms described in Sect. 2.3.1.
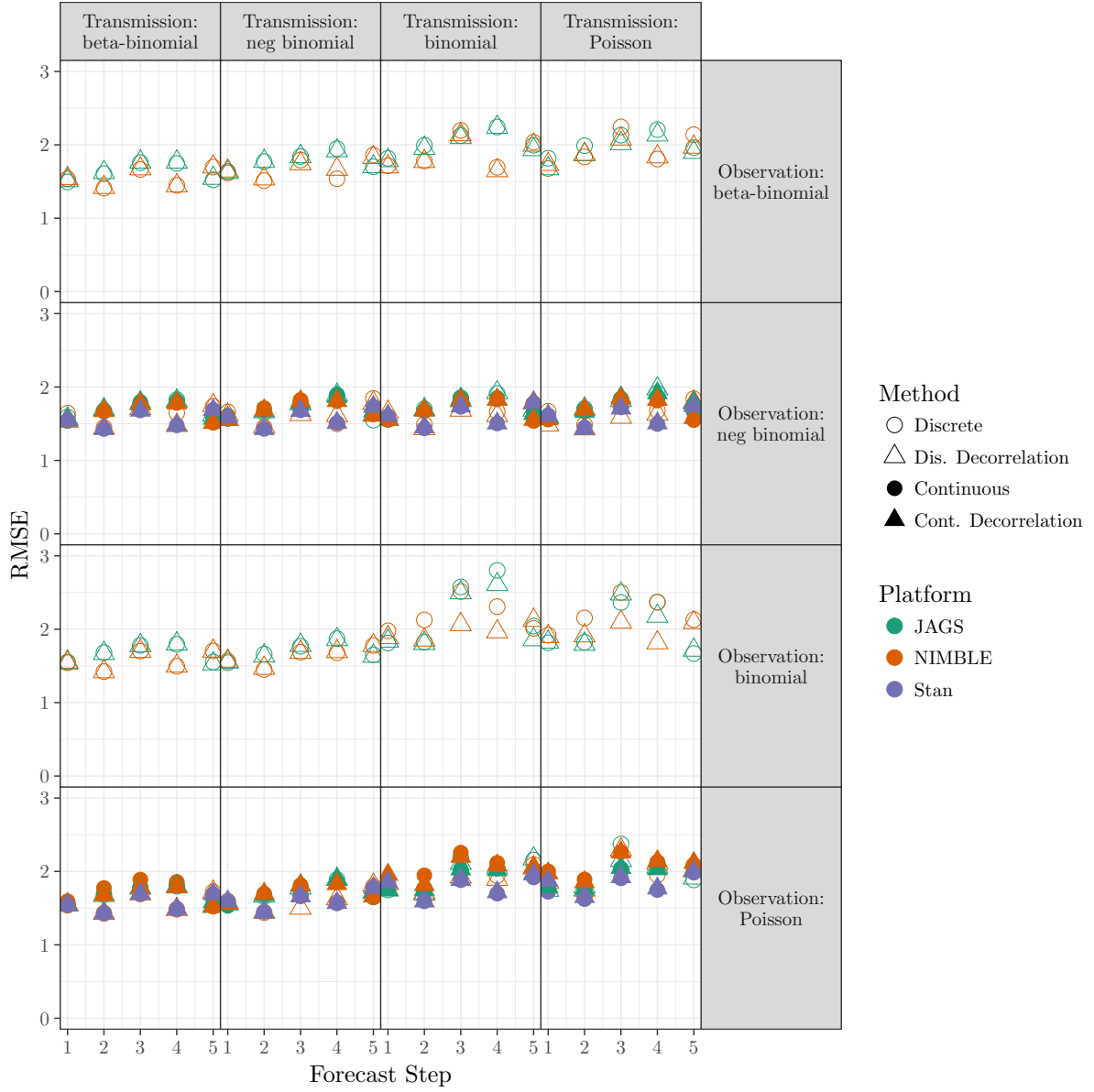
Figure S6: Comparison of rmse for five forecast steps described in Sect. 2.2 across different platforms described in Sect. 2.3.1. See Figure 4 in the main text for details.
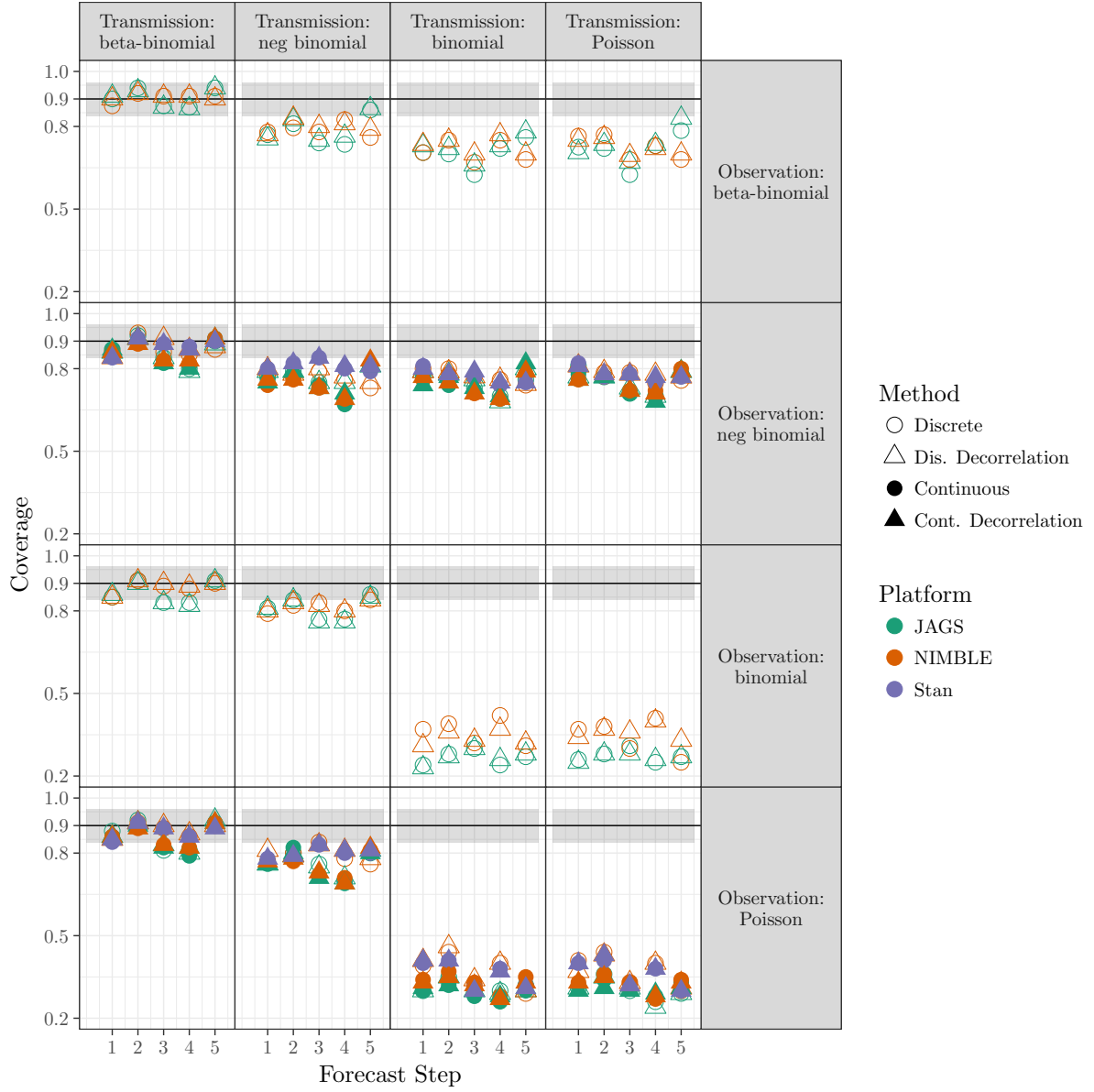
Figure S7: Comparison of coverage for five forecast steps described in Sect. 2.2 across different platforms described in Sect. 2.3.1. See Figure 5 in the main text for details.
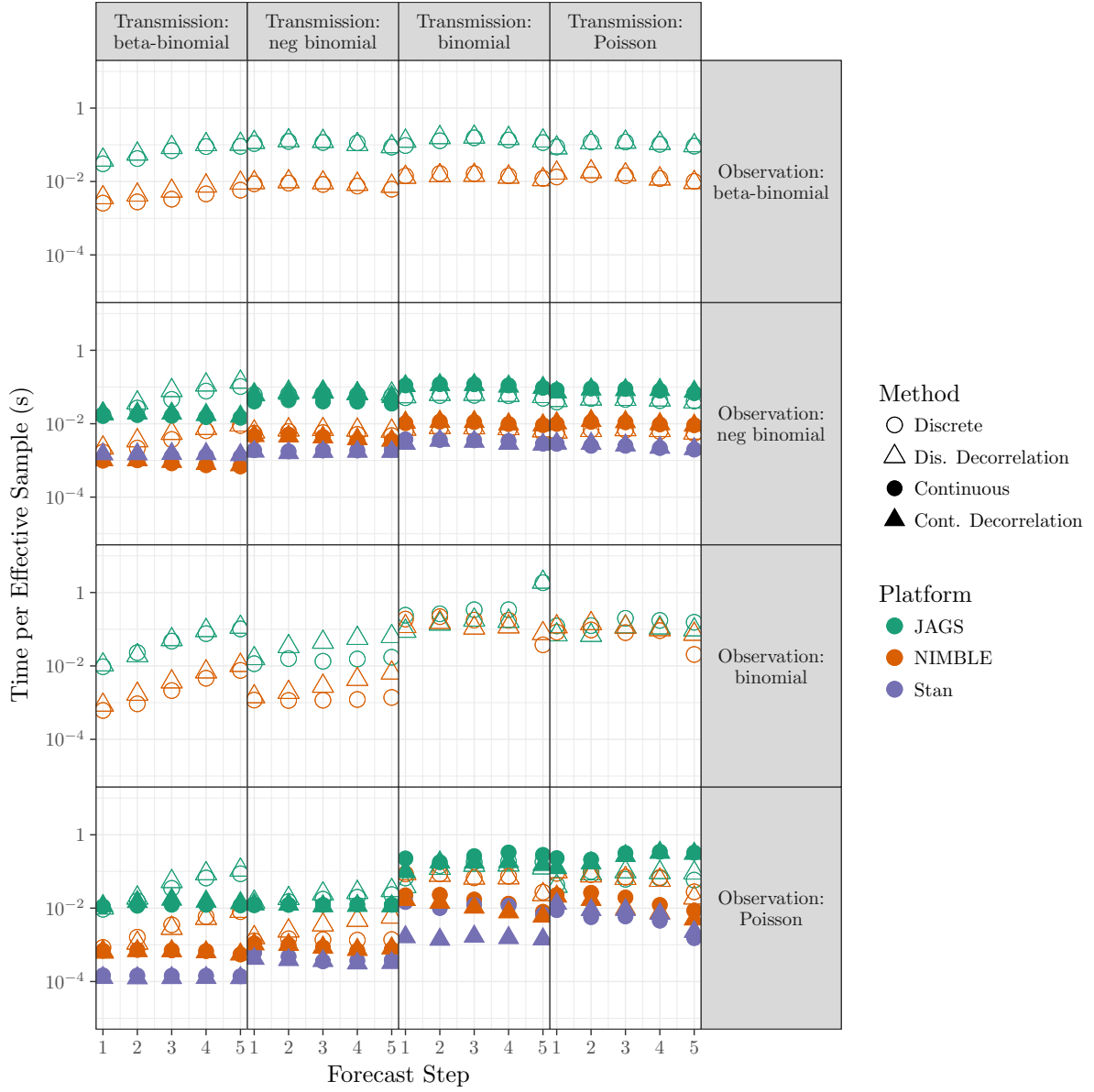
Figure S8: Comparison of efficiency for five forecast steps described in Sect. 2.2 across different platforms described in Sect. 2.3.1. See Figure 6 in the main text for details.

Tables

Table 1: Simulation model parameters

Parameter	Description	True	Prior
N	Total population size	Fixed at 100,000	NA
ℓ	Maximum length of the generation interval	Fixed at 5 time steps	NA
$\mathcal{R}_0$	Basic reproductive number	3	Gamma(shape=15,rate=5)
P_{eff}	Effective susceptible proportion of the population	0.5	Beta($\frac{B_{size}}{1-P_{\text{eff}}}, \frac{B_{size}}{P_{\text{eff}}}$)
P_{rep}	Reporting proportion	0.5	Beta($\frac{B_{size}}{1-P_{\text{rep}}}, \frac{B_{size}}{P_{\text{rep}}}$)
G_p	Position parameter for generation interval	0.5	Beta($\frac{2B_{size}}{1-G_p}, \frac{2B_{size}}{G_p}$)
G_s	Shape parameter for generation interval	1	Gamma(shape=5,rate=5)
δ_P	Beta Binomial transmission process dispersion	1	Gamma(shape=10,rate=10)
δ_{obs}	Beta-Binomial Observation process dispersion	1	Gamma(shape=10,rate=10)

Table 2: Fitting model parameters

Parameter	Description	True	Prior
N	Total population size	Fixed at 100,000	NA
ℓ	Maximum length of the generation interval	Fixed at 5 time steps	NA
B_{size}	Beta prior size factor	Fixed at 1	NA
$\mathcal{R}_0$	Basic reproductive number	3	Gamma(shape=15,rate=5)
P_{eff}	Effective susceptible proportion of the population	0.5	Beta($\frac{B_{size}}{1-P_{\text{eff}}}, \frac{B_{size}}{P_{\text{eff}}}$)
P_{rep}	Reporting proportion	0.5	Beta($\frac{B_{size}}{1-P_{\text{rep}}}, \frac{B_{size}}{P_{\text{rep}}}$)
P_{effrep}	Proportion of effective S to I that are observed	$P_{\text{eff}} \times P_{\text{rep}}$	Beta($\frac{B_{size}}{1-P_{\text{effrep}}}, \frac{B_{size}}{P_{\text{effrep}}}$)
ρ	Scale splitting factor	0.5	Beta($\frac{B_{size}}{1-\rho}, \frac{B_{size}}{\rho}$)
G_p	Position parameter for generation interval	0.5	Beta($\frac{2B_{size}}{1-G_p}, \frac{2B_{size}}{G_p}$)
G_s	Shape parameter for generation interval	1	Gamma(shape=5,rate=5)
δ_P	Beta Binomial transmission process dispersion	1	Gamma(shape=10,rate=10)
δ_P (Neg-Binom)	Negative-Binomial Transmission process dispersion	NA	Uniform(min=0,max=100)
δ_{obs}	Beta-Binomial Observation process dispersion	1	Gamma(shape=10,rate=10)
δ_{obs} (Neg-Binom)	Negative-Binomial Transmission process dispersion	NA	Uniform(min=0,max=100)