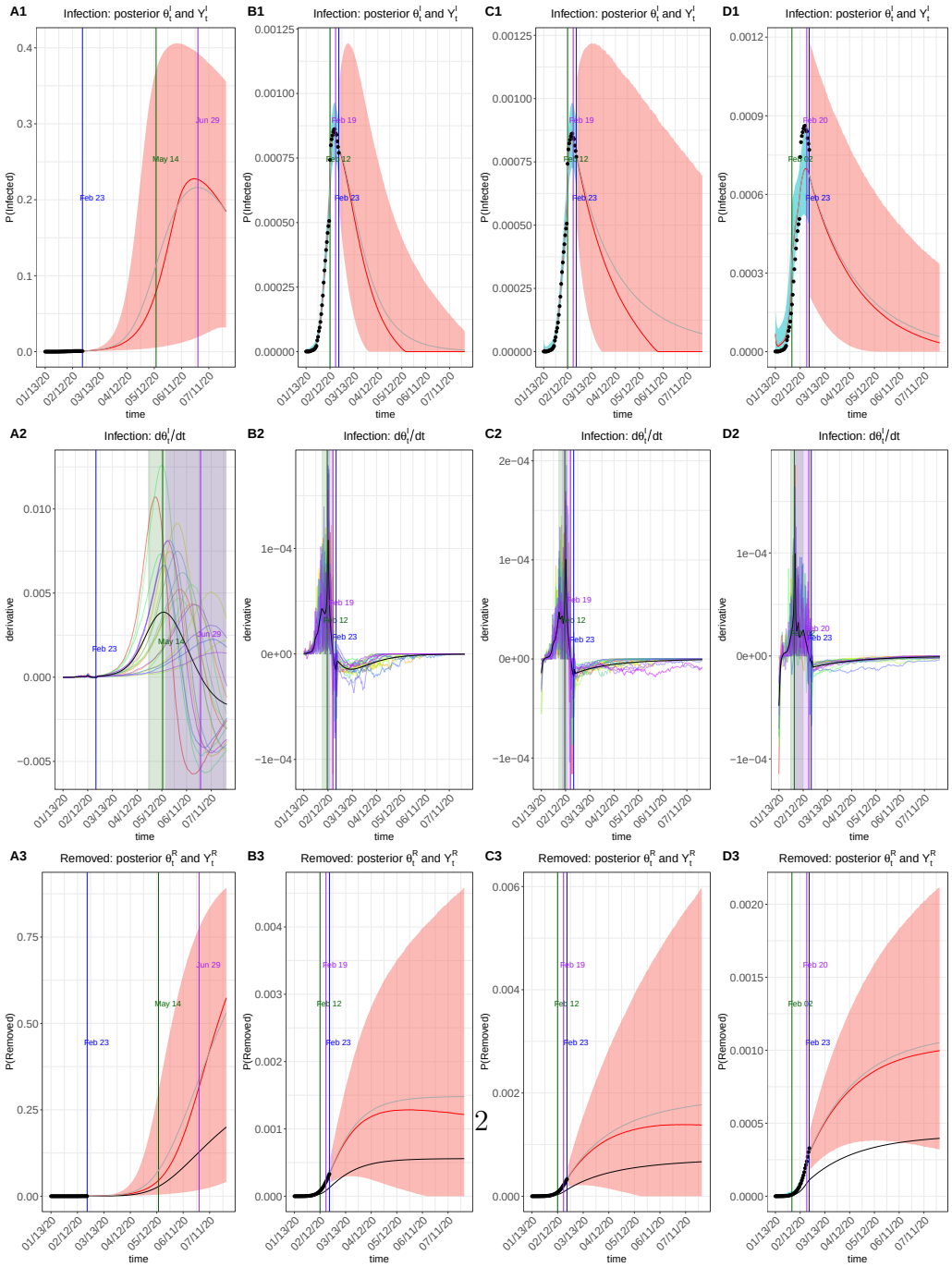
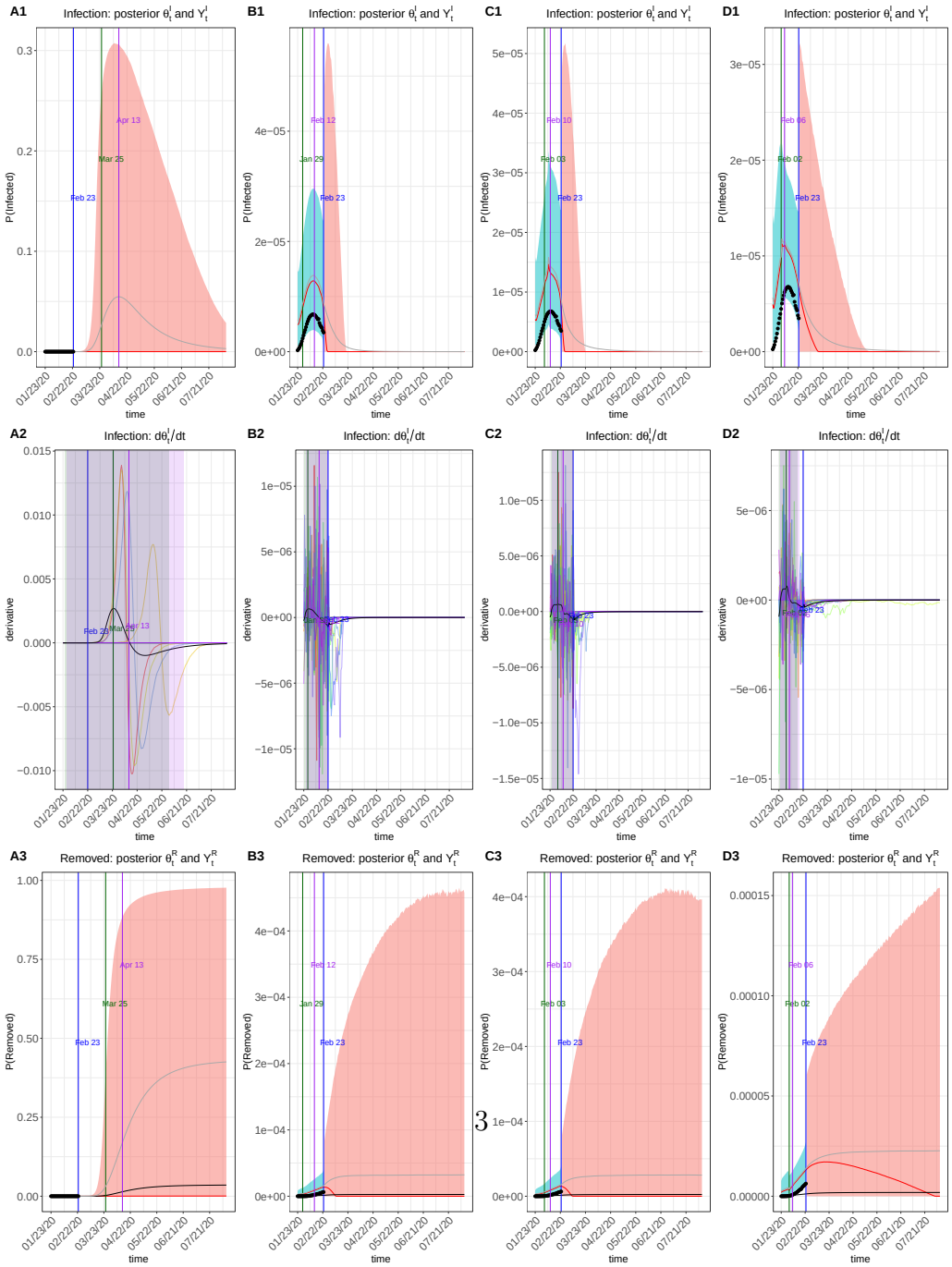
Web-based Supplementary Materials for (An epidemiological forecast model and software assessing interventions on COVID-19 epidemic in China) by (Lili Wang, Yiwang Zhou, Jie He, Bin Zhu, Fei Wang, Lu Tang, Michael Kleinsasser, Daniel Barker, Marisa C. Eisenberg and Peter X.K. Song)

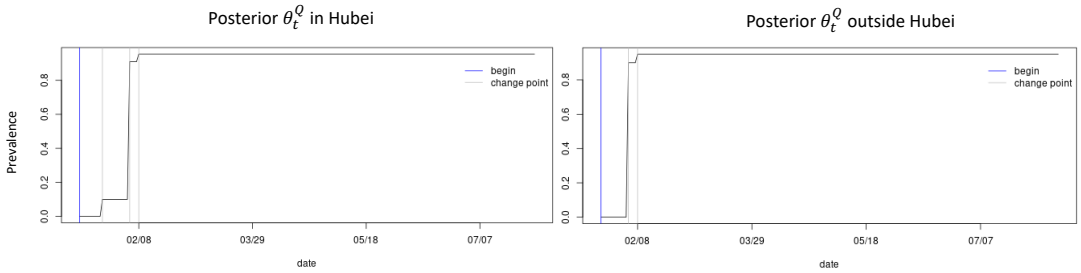
Web Figure 1: Prediction plots of θ_t^I and Y_t^I (Row 1), $\dot{\theta}_t^I$ (Row 2), θ_t^R and Y_t^R (Row 3) for Hubei **without** data calibration. Subfigures in Column A display the results of basic SIR model with $\pi(t) \equiv 1$ or $\phi(t) \equiv 0$, Subfigures in Column B display results of a continuous transmission modifier $\pi(t) = \exp(-0.05t)$, subfigures in Column C display results of a step-function transmission rate modifier with $\boldsymbol{\pi}_0 = (1, 0.9, 0.5, 0.1)$ at change points [Jan 23, Feb 4, Feb 8], and subfigures in Column D display results of a Dirac delta function quarantine process with $\boldsymbol{\phi}_0 = [0.1, 0.9, 0, 5]$ at change points [Jan 23, Feb 4, Feb 8].



Web Figure 2: Prediction plots of θ_t^I and Y_t^I (Row 1), $\dot{\theta}_t^I$ (Row 2), θ_t^R and Y_t^R (Row 3) for provinces outside Hubei. Subfigures in Column A display the results of basic SIR model with $\pi(t) \equiv 1$ or $\phi(t) \equiv 0$, Subfigures in Column B display results of a continuous transmission modifier $\pi(t) = \exp(-0.05t)$, subfigures in Column C display results of a step-function transmission rate modifier with $\boldsymbol{\pi}_0 = (0.8, 0.1)$ at change points [Feb 4, Feb 8], and subfigures in Column D display results of a Dirac delta function quarantine process with $\boldsymbol{\phi}_0 = [0.9, 0, 5]$ at change points [Feb 4, Feb 8].



Web Figure 3: The posterior mean probability of staying in quarantine compartment within and outside Hubei.



Web Table 1: The summary table of turning points for forecast results in Figure 6 and Web Figures 1-2. Note that TP1 denotes the first turning point with the largest daily increment in the prevalence of infection, and TP2 denotes the second turning point with the maximum prevalence of infection. The last forecast date is July 20 for Hubei and July 30 for other provinces.

			TP1		TP2	
Location	Calibrated	Model	Mean	95%CI	Mean	95%CI
Hubei	Yes	No quarantine	June 6	[May 8, July 30]	>July 30	N.A.
		Exponential	Feb 11	[Jan 31, Feb 15]	Feb 19	[Feb 4, Feb 19]
		Step-function	Feb 8	[Jan 31, Feb 15]	Feb 19	[Feb 4, Feb 19]
		Quar. Compart.	Feb 2	[Jan 26, Feb 13]	Feb 19	[Jan 28, Feb 21]
Hubei	No	No quarantine	May 14	[April 26, July 30]	June 29	[May 17,July 30]
		Exponential	Feb 12	[Feb 5, Feb 15]	Feb 19	[Feb 13, Feb 20]
		Step-function	Feb 12	[Feb 4, Feb 15]	Feb 19	[Feb 9, Feb 20]
		Quar. Compart.	Feb 2	[Jan 29, Feb 13]	Feb 20	[Feb 2, Feb 21]
Others	No	No quarantine	Mar 25	[Jan 26, May 31]	April 13	[Jan 28, June 18]
		Exponential	Jan 29	[Jan 25, Feb 22]	Feb 12	[Jan 27, Feb 23]
		Step-function	Feb 3	[Jan 25, Feb 22]	Feb 10	[Jan 27, Feb 23]
		Quar. Compart.	Feb 2	[Jan 25, Feb 16]	Feb 6	[Jan 26, Feb 18]

Web Table 2: The summary table for the second outbreak forecast in Hubei with or without relaxation of the human intervention. We used step function $\pi(t)$ as transmission rate modifier with $\boldsymbol{\pi}_0 = (1, 0.9, 0.5, 0.1, \pi_{05})$ at change points [Jan 23, Feb 4, Feb 8, Feb 24]. We considered π_{05} equal 0.1, 0.3 and 0.5 for "strictly continuing", "slightly loosening" and "moderately loosening" the previous control actions, and recorded their maximum prevalence of infection and cumulative infection proportions as well as their 95% credible intervals. The last forecast date is July 20.

	Maximum Prevalence (%)			Cumulative infection (%)	
π_{05}	Date	Mean	95%CI	Mean	95%CI
0.1	Feb 19	0.08	[0.07, 0.10]	0.13	[0, 0.43]
0.3	July 20	0.55	[0, 3.82]	1.44	[0.02, 8.23]
0.5	July 20	7.47	[0.01, 30.12]	16.67	[0.18, 78.68]