

Document S1. Viral load curve parameter distributions and hyperparameters

Table S1. Distributions and means of log-viral load curve parameters' underlying normal variables

Disease-variant	Asymptomatic / symptomatic	Parameter	Distribution	Mean (if log-normal, mean of log)
COVID-19 prealpha	Both	Initial log-viral load	Constant	1.49
		Rate of increase in log-viral load	Log-normal	1.18
		Peak log-viral load	Normal	8.14
		Rate of decrease in log-viral load	Normal	0.69
	Symptomatic	Days from peak to onset of symptoms	Normal	0.6
COVID-19 alpha	Both	Initial log-viral load	Constant	1.49
		Rate of increase in log-viral load	Log-normal	1.14
		Peak log-viral load	Normal	8.14
		Rate of decrease in log-viral load	Normal	0.82
	Symptomatic	Days from peak to onset of symptoms	Normal	0.6
COVID-19 delta (unvaccinated)	Both	Initial log-viral load	Constant	1.49
		Rate of increase in log-viral load	Log-normal	1.03
		Peak log-viral load	Normal	8.14
		Rate of decrease in log-viral load	Normal	0.79
	Symptomatic	Days from peak to onset of symptoms	Normal	0.6
COVID-19 delta (vaccinated)	Both	Initial log-viral load	Constant	1.49
		Rate of increase in log-viral load	Log-normal	0.99
		Peak log-viral load	Normal	8.14
		Rate of decrease in log-viral load	Normal	0.95
	Symptomatic	Days from peak to onset of symptoms	Normal	0.6
COVID-19 omicron (vaccinated)	Both	Initial log-viral load	Constant	1.0084

		Rate of increase in log-viral load	Log-normal	0.99
		Peak log-viral load	Normal	7.6584
		Rate of decrease in log-viral load	Normal	0.95
	Symptomatic	Days from peak to onset of symptoms	Normal	0.6
Influenza A-H1N1	Asymptomatic	Initial log-viral load	Constant	0
		Rate of increase in log-viral load	Log-normal	-0.30231
		Peak log-viral load	Normal	1.72
		Rate of decrease in log-viral load	Log-normal	-0.41705
	Symptomatic	Initial log-viral load	Constant	0
		Rate of increase in log-viral load	Log-normal	0.69197
		Peak log-viral load	Normal	4.60588
		Rate of decrease in log-viral load	Log-normal	0.18735
		Days from peak to onset of symptoms	Normal	-0.07353

Table S2. Covariance matrix of log-viral load curve parameters' underlying normal variables for COVID-19 prealpha

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load	Days from peak to onset of symptoms (symptomatic only)
Initial log-viral load	0	0	0	0	0
Rate of increase in log-viral load	0	0.09090	0.01166	-0.00342	0
Peak log-viral load	0	0.01166	0.0081	-0.00238	0
Rate of decrease in log-viral load	0	-0.00342	-0.00238	0.0036	0
Days from peak to onset of symptoms (symptomatic only)	0	0	0	0	0.0225

Table S3. Covariance matrix of log-viral load curve parameters' underlying normal variables for COVID-19 alpha

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load	Days from peak to onset of symptoms (symptomatic only)
Initial log-viral load	0	0	0	0	0
Rate of increase in log-viral load	0	0.1024	0.01241	-0.00455	0
Peak log-viral load	0	0.01241	0.0081	-0.00297	0
Rate of decrease in log-viral load	0	-0.00455	-0.00297	0.00563	0
Days from peak to onset of symptoms (symptomatic only)	0	0	0	0	0.0225

Table S4. Covariance matrix of log-viral load curve parameters' underlying normal variables for COVID-19 delta (unvaccinated)

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load	Days from peak to onset of symptoms (symptomatic only)
Initial log-viral load	0	0	0	0	0
Rate of increase in log-viral load	0	0.11223	0.01303	-0.00796	0
Peak log-viral load	0	0.01303	0.0081	-0.00495	0
Rate of decrease in log-viral load	0	-0.00796	-0.00495	0.01563	0
Days from peak to onset of symptoms (symptomatic only)	0	0	0	0	0.0225

Table S5. Covariance matrix of log-viral load curve parameters' underlying normal variables for COVID-19 delta (vaccinated) and omicron (vaccinated)

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load	Days from peak to onset of symptoms (symptomatic only)
Initial log-viral load	0	0	0	0	0
Rate of increase in log-viral load	0	0.10563	0.01262	-0.00709	0
Peak log-viral load	0	0.01262	0.0081	-0.00455	0
Rate of decrease in log-viral load	0	-0.00709	-0.00455	0.01323	0
Days from peak to onset of symptoms (symptomatic only)	0	0	0	0	0.0225

Table S6. Covariance matrix of log-viral load curve parameters' underlying normal variables for influenza A-H1N1 (asymptomatic)

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load
Initial log-viral load	0	0	0	0
Rate of increase in log-viral load	0	0.14266	-0.03314	0.10667
Peak log-viral load	0	-0.03314	0.45511	-0.08302
Rate of decrease in log-viral load	0	0.10667	-0.08302	0.10516

Table S7. Covariance matrix of log-viral load curve parameters' underlying normal variables for influenza A-H1N1 (symptomatic)

	Initial log-viral load	Rate of increase in log-viral load	Peak log-viral load	Rate of decrease in log-viral load	Days from peak to onset of symptoms
Initial log-viral load	0	0	0	0	0
Rate of increase in log-viral load	0	0.27304	0.48881	0.08925	-0.00734
Peak log-viral load	0	0.48881	2.25512	0.48155	0.07166
Rate of decrease in log-viral load	0	0.08925	0.48155	0.29023	0.04914
Days from peak to onset of symptoms	0	-0.00734	0.07166	0.04914	0.66867