

Table S1. Model parameters.

	Parameter	Symbol	Value (95% CI)	Equation	Ref.
Modeling individual viremia trajectories	Uninfected target cells	x	A/γ (initial)	2	[1]
	Infected target cells	y	0 (initial)	2	[2]
	Free viral particles	v	1 (initial)	2	[2]
	Clearing immune response	z	1°S: 0.347 (0.285,0.548) 2°S: 0.411(0.248,0.594) 2°DHF: 0.380 (0.0298,0.526) (initial)	2	[2]
	Daily production of target cells	A	1.4×10^6	2	[3]
	Death rate target cells	γ	0.14	2	[1]
	Infection rate	β	1°S: 1.72 (1.50,1.98) 2°S: 2.30 (2.14,2.50) 2°DHF: 2.82 (2.58,3.23) ($\times 10^{-10}$)	2	[2]
	Death rate infected target cells	δ	0.14	2	[1]
	Removal rate infected cells	α	0.001	2	[2]
	Viral particle production rate	ω	1×10^4	2	[4]
Infectiousness calculations	Viremia (\log_{10} cDNA copies/mL)	V	-	3-6	
	Logistic intercept	β_0	A: -11.50 (-17.59,-4.16) Pre-sym S: -3.09 (-4.24,-2.01) Post-sym S: -6.37 (-7.12,-5.62)	3	[5]
	Slope coefficient	β_1	A: 2.16 (0.92, 3.42) Pre-sym S: 0.60 (0.43,0.77) Post-sym S: 0.88 (0.77, 0.98)	3	[5]
Population seroprofile calculation	Age	a		7-8	
	Proportion pre-exposed to i serotypes at age a	$e_i(a)$		7-8	
	Proportion cross-immune after exposure with i serotypes at age a	$r_i(a)$		7	
	Duration cross-immune period	σ^{-1}	2 years	1,7,13	[6]
	Proportion of the population in each age group	$p(a)$		8	
	Proportion of population pre-exposed to i serotypes	E_i		8-10	
	Proportion of population cross-immune after pre-	R_i		1,13	

		exposure to i serotypes			
Meta-analysis of (A+IS):AS ratios	Disease outcome calculation	Asymptomatic to symptomatic ratio given pre-exposure to i serotypes	θ_i	9.2%	9 [5]
		Inapparent to apparent ratio given pre-exposure to i serotypes	ζ_i	1°: 0.82 (0.81,0.84) 2°: 0.76 (0.74,0.78) >2°:0.86 (0.63,0.97)	10 [7]
Contribution of each infection class to force of infection		Location and time-specific force of infection	λ_j		
		Infection prevalence hosts	X		11-13
		Probability that a susceptible host becomes infected upon a bite of an infectious vector	b	Cancels out	1,11
		Ratio of vectors to hosts	m	Cancels out	1,11
		Bites per vector lifetime	a/g	4	1,11-12
		Infection prevalence vectors	Y		
	Extrinsic incubation period	n	Cancels out	1,11	
	Probability that a susceptible vector becomes infected upon biting an infectious host given infectious class A or S	$c_{A \text{ or } S}$		11-13	
	Infectious period	τ^{-1}	5		

References

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