

**Table S1. Model parameters**

Parameter	Value	Description	Source
$VE_S$	0.4	Reduction in susceptibility from vaccination	[1]
$VE_I$	0.4	Reduction in infectiousness from vaccination	[1]
$VE_P$	0.667	Reduction in becoming symptomatic upon infection from vaccination	[1]
$\tau$	28 days	Time for a vaccine to reach full efficacy	
$R_0$	1.4–1.85	Basic reproductive number in-season	
$R_{min}$	0.8	Reproductive number out-of-season	
$m$	0.5	ratio of asymptomatic to symptomatic infectiousness	
$p_{symp}$	0.67	probability of becoming symptomatic given infection	[2]
sympRatio	0.25	Ratio of travel probability of travel of symptomatic to asymptomatic	
$v_i$		Relative infectiousness on day $i$	[3–4]

[1] Basta NE, Halloran ME, Matrajt L, Longini IM Jr (2008) Estimating influenza vaccine efficacy from challenge and community-based study data. *Am J Epidemiol* 168: 1343–52.

[2] Carrat F, Vergu E, Ferguson NM, Lemaître M, Cauchemez S, et al. (2008) Time lines of infection and disease in human influenza: a review of volunteer challenge studies. *Am J Epidemiol* 167: 775–85. [3] Murphy BR, Rennels MB, Douglas RG Jr, Betts RF, Couch RB, et al. (1980) Evaluation of influenza A/Hong Kong/123/77 (H1N1) ts-1A2 and cold-adapted recombinant viruses in seronegative adult volunteers. *Infect Immun* 29:348–55.

[4] Baccam P, Beauchemin C, Macken CA, Hayden FG, Perelson AS (2006) Kinetics of influenza A virus infection in humans. *J Virol* 80: 7590–9.