The system of differential equations describing the vector-human transmission cycle of dengue is given below. Parameters are given in the Table. The system was numerically integrated in continuous time in MATLAB® (MATLAB 2007) using a fourth-fifth order Runge-Kutta solver ("ode45"). The initial conditions corresponding to first day of the year, derived by running the model to equilibrium, were: 1 billion mosquitoes: 98.75% eggs, 0.41% larva, 0.07% pupa, 0.18% young adults and 0.59% old adults; 5 million humans: 0.71% R_m, 2.60% S_1, 0.02% I_1, 0.66% R_1, 2.44% S_2, 0.00% I_2, 93.57% R_2. Model's files are available from the authors upon request.

$$dE/dt = bO_T - t_{EL}(t)E - d_E E$$
$$dL/dt = t_{EL}(t)E - t_{LP}(t)L - d_L(L)L$$
$$dP/dt = t_{LP}(t)L - t_{PY}(t)P - d_P P$$
$$dY/dt = t_{PY}(t)P - t_{YO}Y - d_Y Y$$
$$dO/dt = t_{YO}Y - d_O O - \lambda_M \tau O$$
$$dO_1/dt = \lambda_M \tau O - d_O O_1$$
$$dR_m/dt = BH - \alpha R_m - d_H R_m$$
$$dS_1/dt = \alpha R_m - \lambda_1 S_1 - d_H S_1$$
$$dI_1/dt = \lambda_1 S_1 - \gamma I_1 - d_H I_1$$
$$dR_1/dt = \gamma I_1(1 - v_1) - \delta R_1 - d_H R_1$$
$$dS_2/dt = \delta R_1 - \lambda_2 S_2 - d_H S_2$$
$$dI_2/dt = \lambda_2 S_2 - \gamma I_2 - d_H I_2$$
$$dR_2/dt = \gamma(1 - v_2)I_2 - \delta R_2 - d_H R_2$$

Symbol	Definition	Notes and values[a]	References
t_{ij}	Transition rate between life stages i (current) and j (next)	$t_{EL}(t) = 1/120\{1 + 1/4[\sin(t\pi/180 + 1.8326)]\}$ $t_{LP}(t) = 1/12\{1 + 1/4[\sin(t\pi/180 + 1.0472)]\}$ $t_{PY}(t) = 1/2\{1 + 1/4[\sin(t\pi/180 + 1.0472)]\}$ $t_{YO}(t) = 1/5$	Luz et al. (2009)
d_i	Death rate for each life stage I, where $i = E, L, P, Y, O$	$d_E = 0.01005$ $d_L(L_T) = [0.10536 + 0.00001L_T]$ $d_P = 0.01005$ $d_Y = 0.02020$ $d_O = 0.06187$	Crovello and Hacker (1972), Southwood et al. (1972), Barrera et al. (2006), Braks et al. (2006); Styer et al. (2007a)
b	Rate of egg production	$b_g = 4$	Styer et al. (2007b)
d_H	Human death rate	$d_H = 0.00002$	Anonymous (2008)
B	Human birth rate	$B = 0.00005$	Anonymous (2008)
α	Rate of loss of maternal antibody	Average duration of maternal antibody is four months. $\alpha = 0.0083$	
γ	Infection recovery rate	Average duration of infection is seven days. $\gamma = 0.1429$	Nishiura (2006), Nagao and Koelle (2008)
δ	Rate of loss of cross-immunity	Average duration of cross-immunity is one year. $\delta = 0.0028$	Nagao and Koelle (2008)
v_1, v_2	Risk of death from infection	Acts on those presenting with DHF. $v_1 = 0.00002$ $v_2 = 0.0003$	Nagao and Koelle (2008)
c	Biting rate	$c = 0.8$	Scott et al. (2000a)
τ	Extrinsic incubation period	Average duration of extrinsic incubation period is 10 days. $\tau = 0.1$	Watts et al. (1987)
β_M β_1 β_2	Infectivity	Probability of transmitting virus. $\beta_M = 0.5$ $\beta_1 = \beta_2 = 0.9$	Focks et al. (1995), Nishiura (2006)
σ_M σ_1 σ_2	Susceptibility	Probability of acquiring virus. $\sigma_M = \sigma_1 = 1$ $\sigma_2 = 3 / 4$	-

a: all rates are defined as per day. DHF: dengue haemorrhagic fever.