

## 0.1 Current Results

To verify our results, different scenarios have been considered for different initial conditions of the costate variables. We also considered different values of  $w_{max}$  and  $z_{max}$  corresponding to the maximum isolation and travel restriction respectively.

**Isolation-only**  $\lambda_w(0) < \lambda_{I_1}(0)$

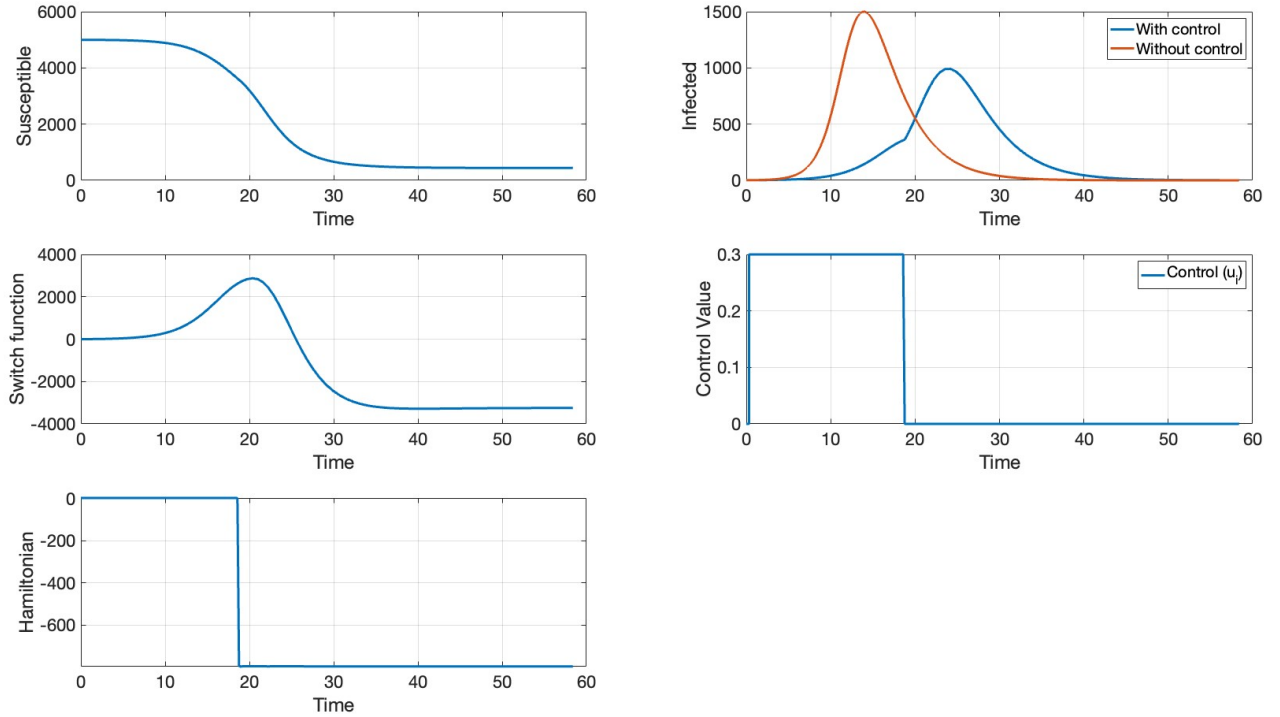


Figure 1: Dynamics of isolation-only model for  $w_{max} = 500$ ,  $T = 58.39$ ,  $H = 5.5628e + 10$

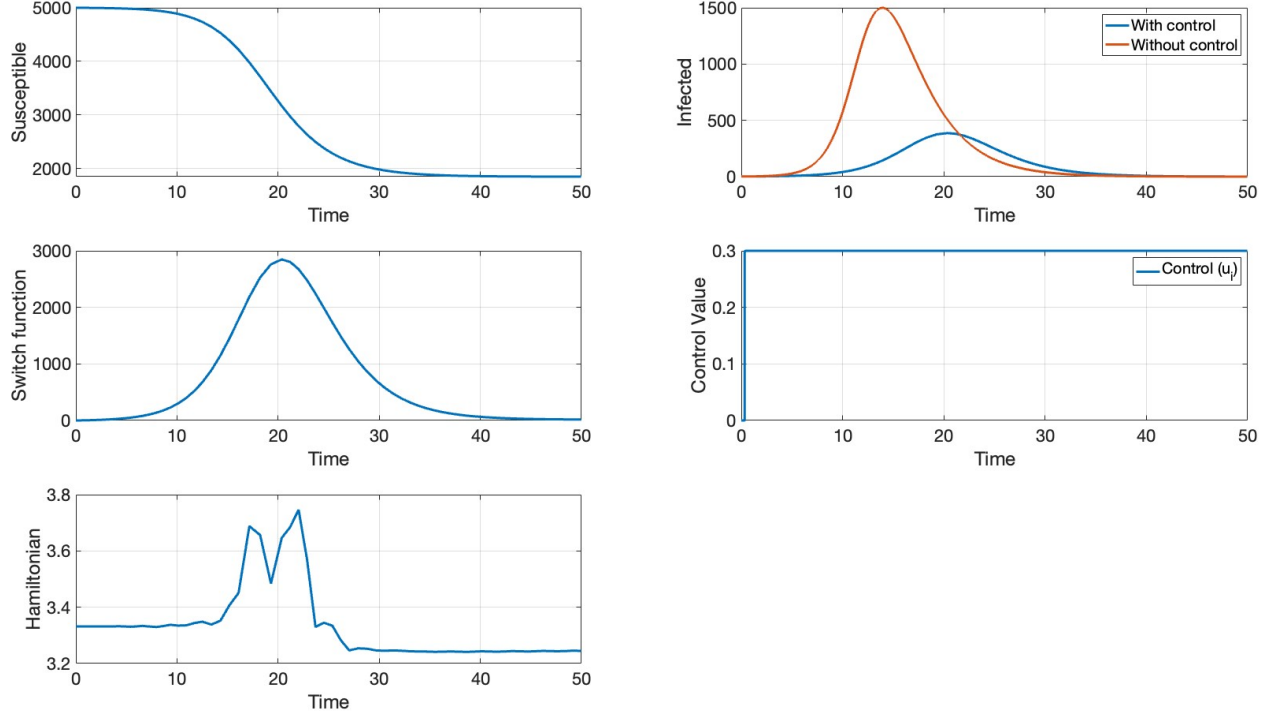


Figure 2: Dynamics of isolation-only model for  $w_{max} = 1500$ ,  $T = 49.95$ ,  $H = -1.2710e +$   
08

Isolation-only  $\lambda_w(0) > \lambda_{I_1}(0)$

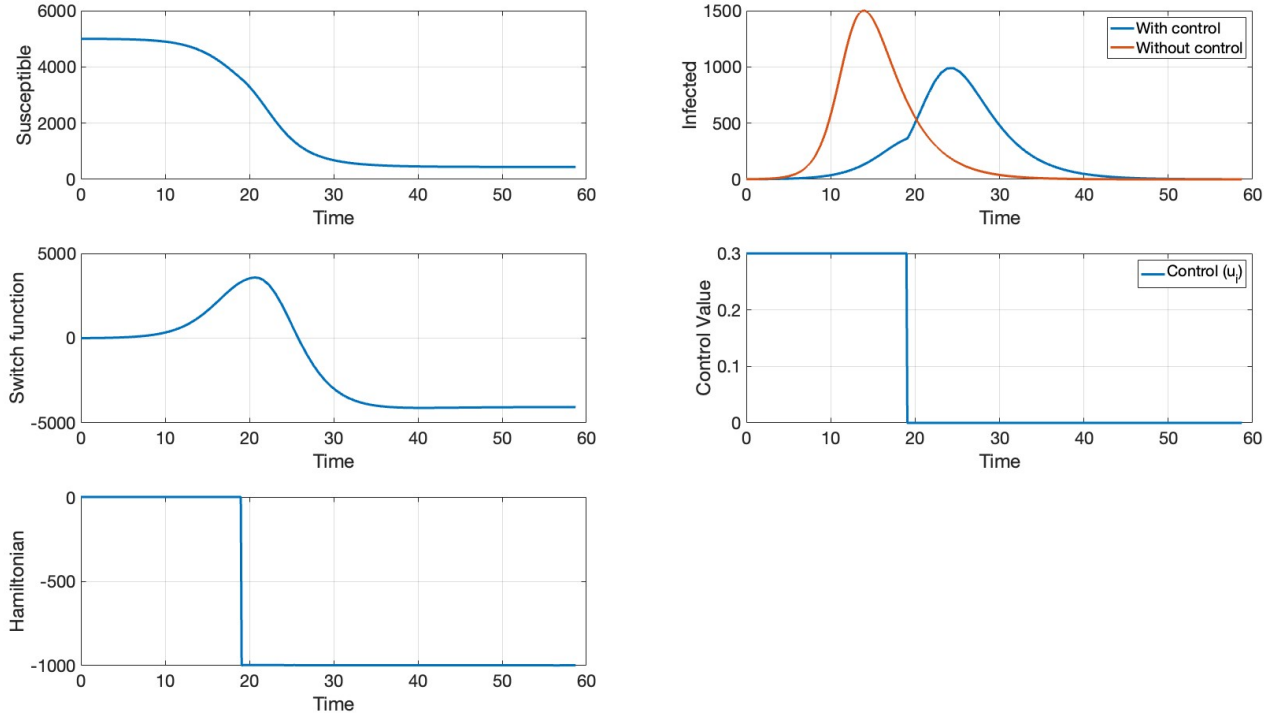


Figure 3: Dynamics of isolation-only model for  $w_{max} = 500$ ,  $T = 58.71$ ,  $H = 5.4817e + 10$

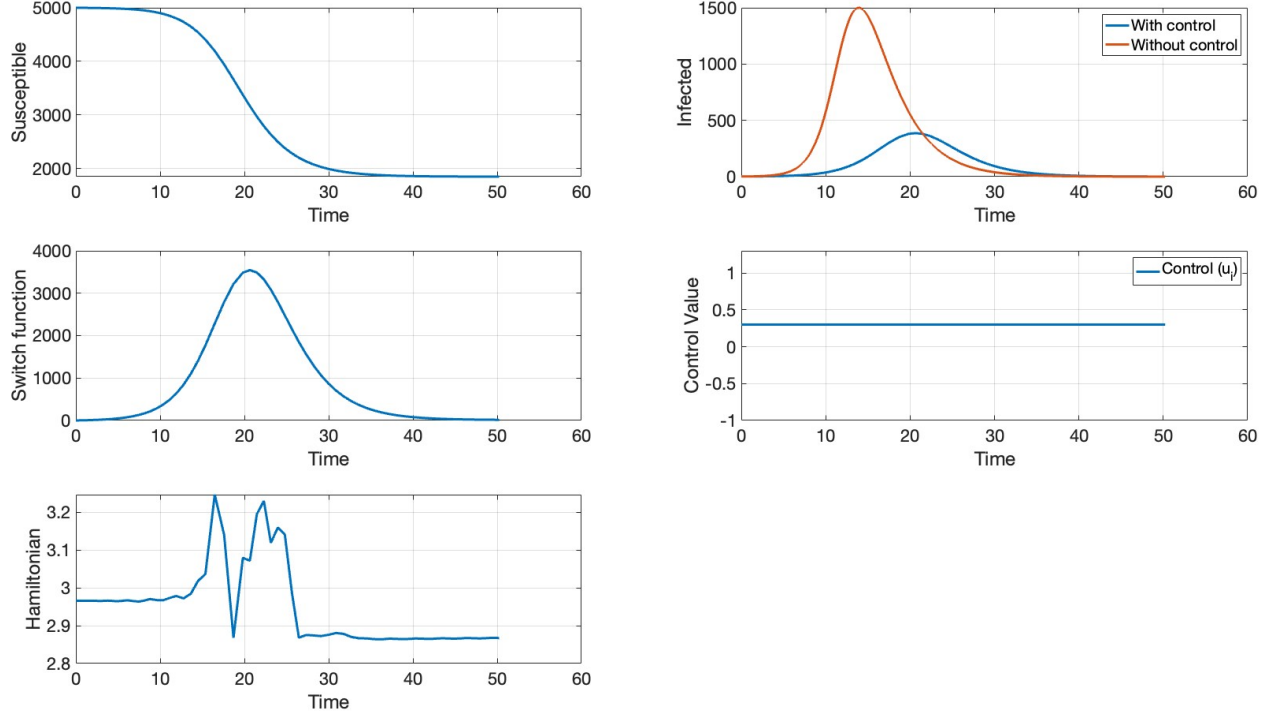


Figure 4: Dynamics of isolation-only model for  $w_{max} = 1500$ ,  $T = 50.23$ ,  $H = -1.1262e + 08$

Isolation-only				
Optimality Condition	Resource Capacity ( $w_{max}$ )	Simulation Time (T)	Cumulative Hamiltonian	
$\lambda_w(0) < \lambda_{I_1}(0)$	500	58.39	$5.5628e + 10$	
	1500	49.95	$-1.2710e + 08$	
$\lambda_w(0) > \lambda_{I_1}(0)$	500	58.71	$5.4817e + 10$	
	1500	50.23	$-1.1262e + 08$	

### Travel Restrictions-only $\lambda_z(0) < \lambda_{I_2}(0)$

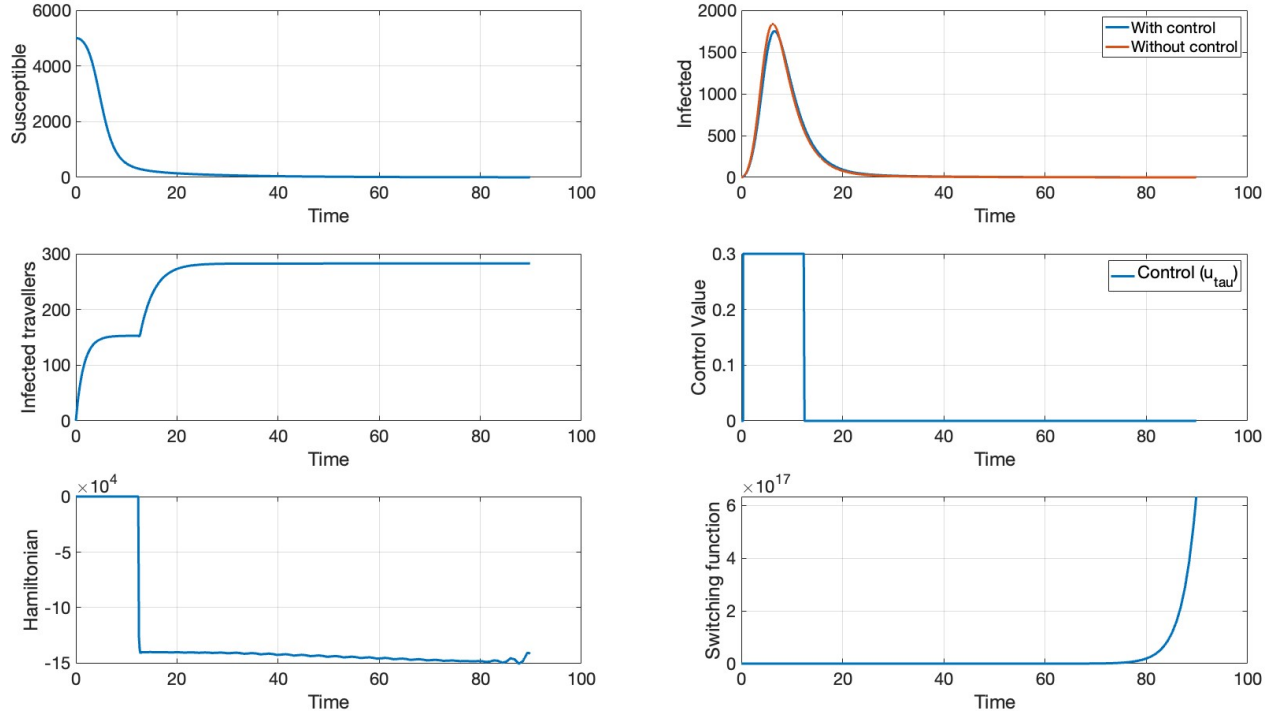


Figure 5: Dynamics of Travel Restrictions -only model for  $z_{max} = 500$ ,  $T = 89.84$ ,  $H = 9.5716e + 21$

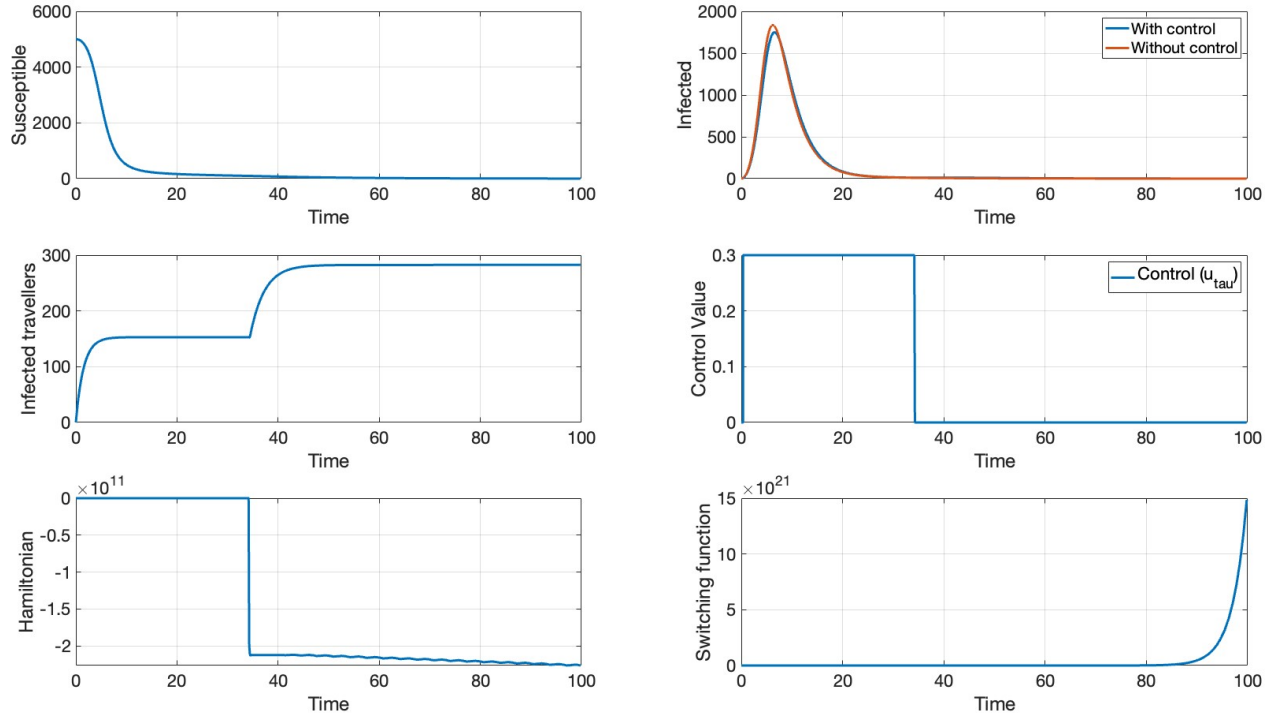


Figure 6: Dynamics of Travel Restrictions -only model for  $z_{max} = 1500$ ,  $T = 99.82$ ,  $H = 2.7362e + 26$

### Travel Restrictions-only $\lambda_z(0) > \lambda_{I_2}(0)$

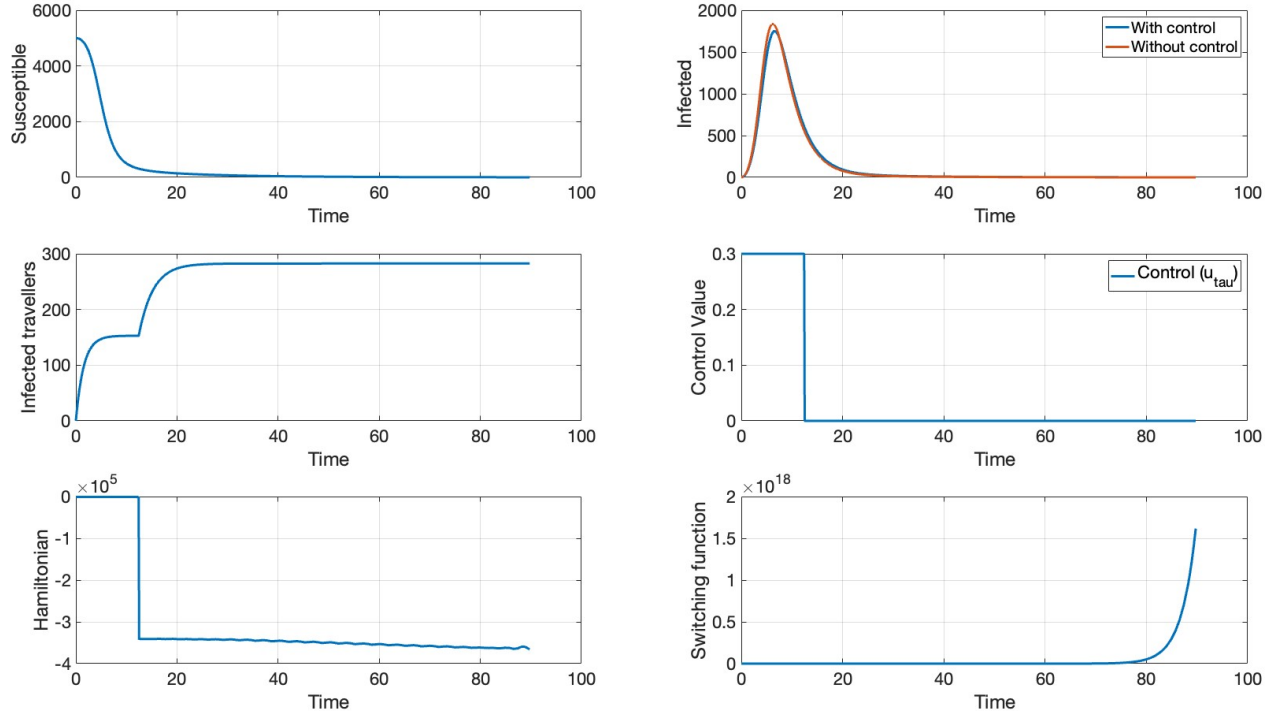


Figure 7: Dynamics of Travel Restrictions -only model for  $z_{max} = 500$ ,  $T = 89.74$ ,  $H = 2.2575e + 22$

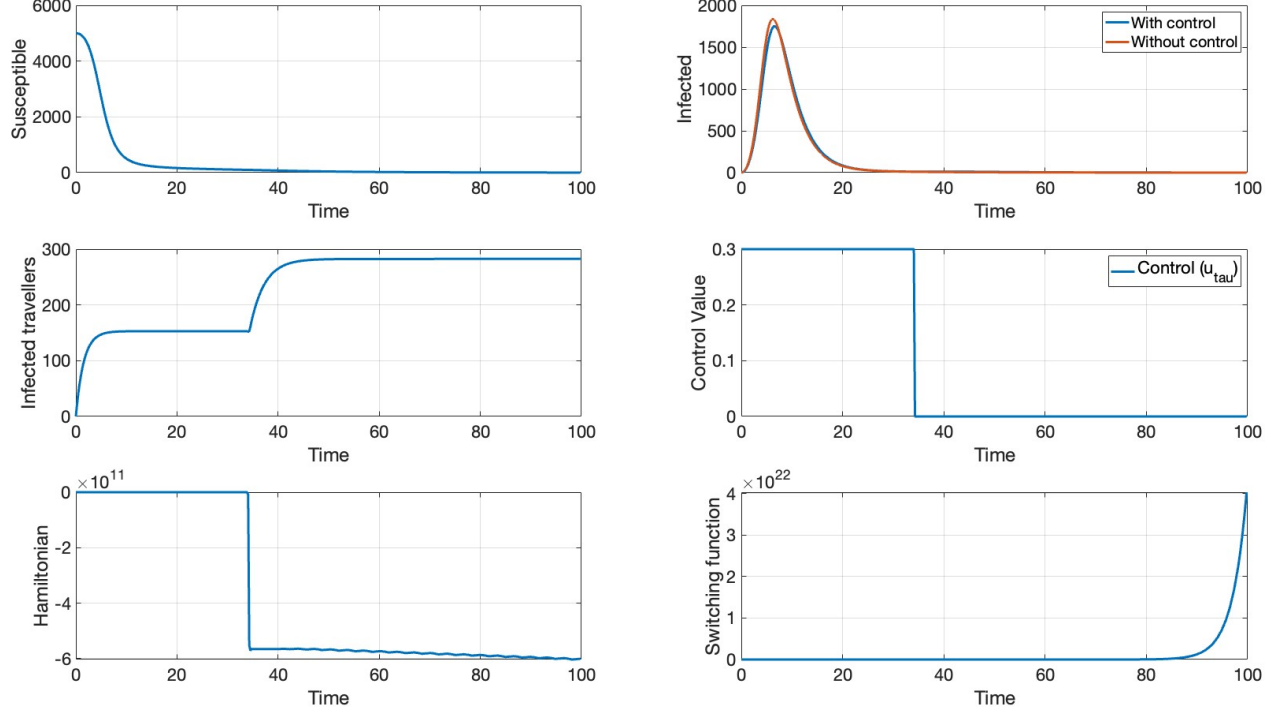


Figure 8: Dynamics of Travel Restrictions -only model for  $z_{max} = 1500$ ,  $T = 99.79$ ,  $H = 9.2207e + 26$

Travel Restrictions-only			
Optimality Condition	Resource Capacity ( $z_{max}$ )	Simulation Time (T)	Cumulative Hamiltonian
$\lambda_z(0) < \lambda_{I_2}(0)$	500	89.84	$9.5716e + 21$
	1500	99.82	$2.7362e + 26$
$\lambda_z(0) > \lambda_{I_2}(0)$	500	89.74	$2.2575e + 22$
	1500	99.79	$9.2207e + 26$



**Mixed-Policy** (  $\lambda_w(0) > \lambda_{I_1}(0)$ ,  $\lambda_z(0) > \lambda_{I_2}(0)$  )

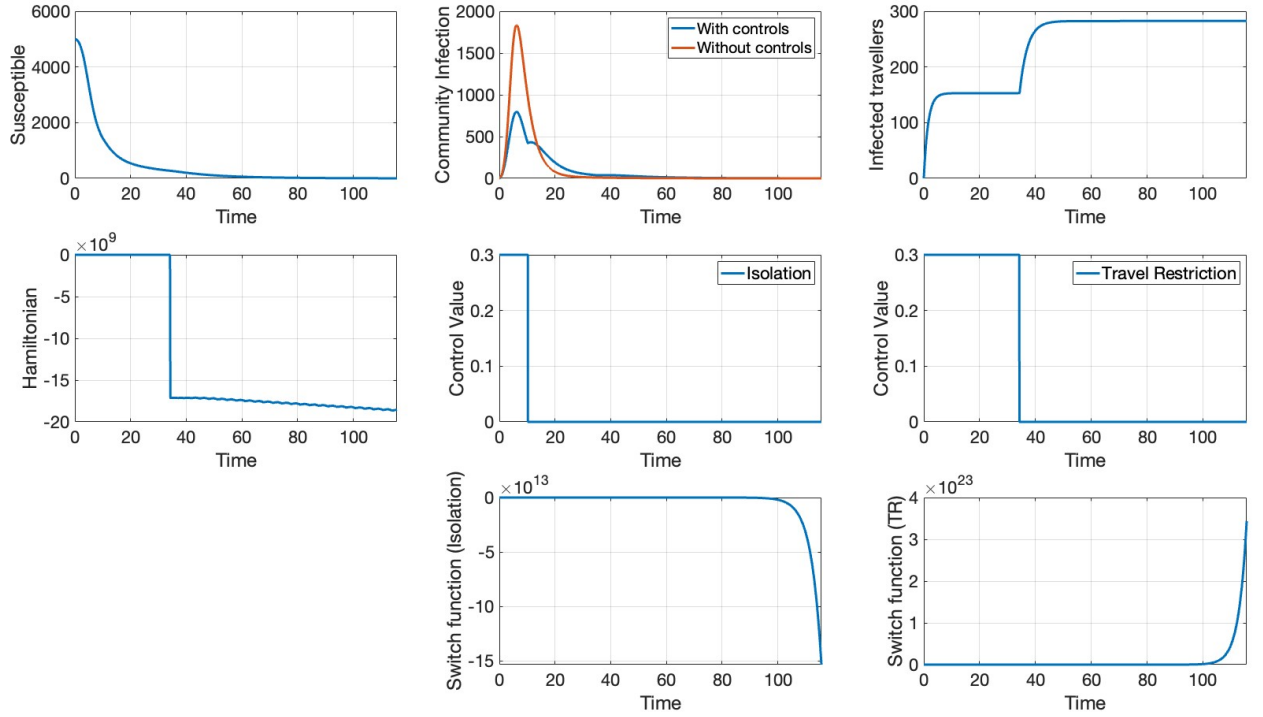


Figure 9: Dynamics of mixed-policy model for  $w_{max} = 1500$ ,  $z_{max} = 1500$ ,  $T = 115.69$ ,  $H = 1.0110e + 28$

Based on our analysis of various scenarios, implementing travel restrictions early yields the most significant impact on controlling the spread of disease. Conversely, postponing these restrictions carries drawbacks and has minimal to no benefit on disease control. In contrast, isolation measures prove more effective than travel restrictions. Early implementation of isolation helps minimize the peak of infection and delays its occurrence, whereas delaying isolation measures has the opposite effect.