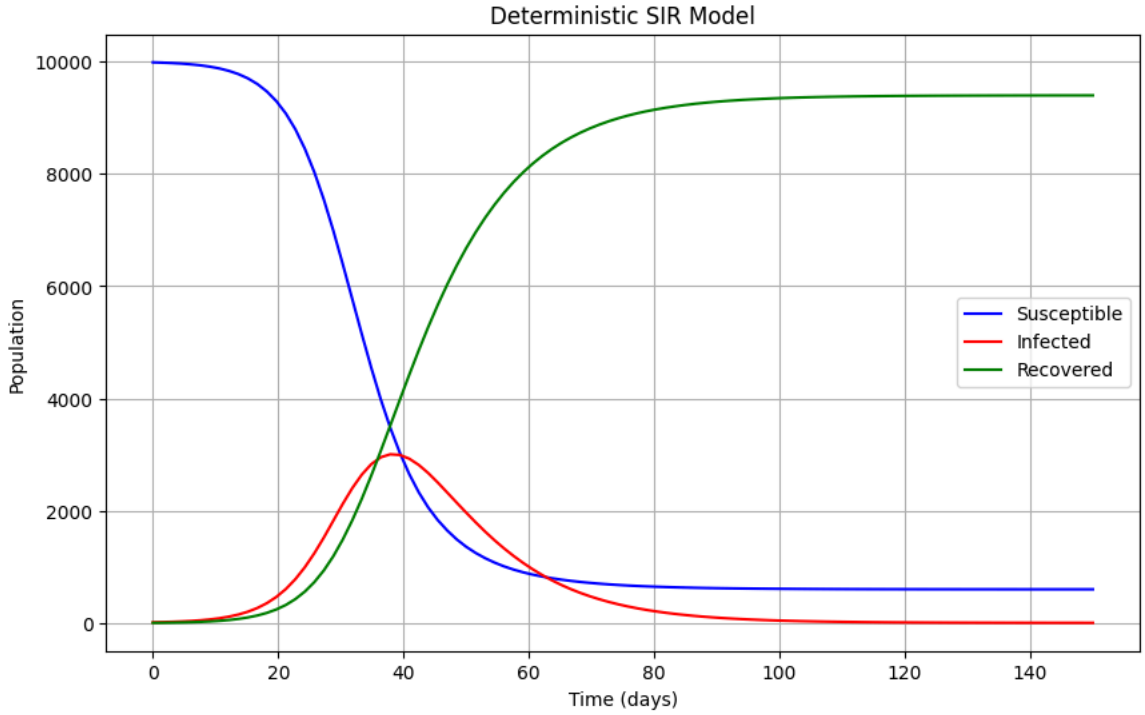
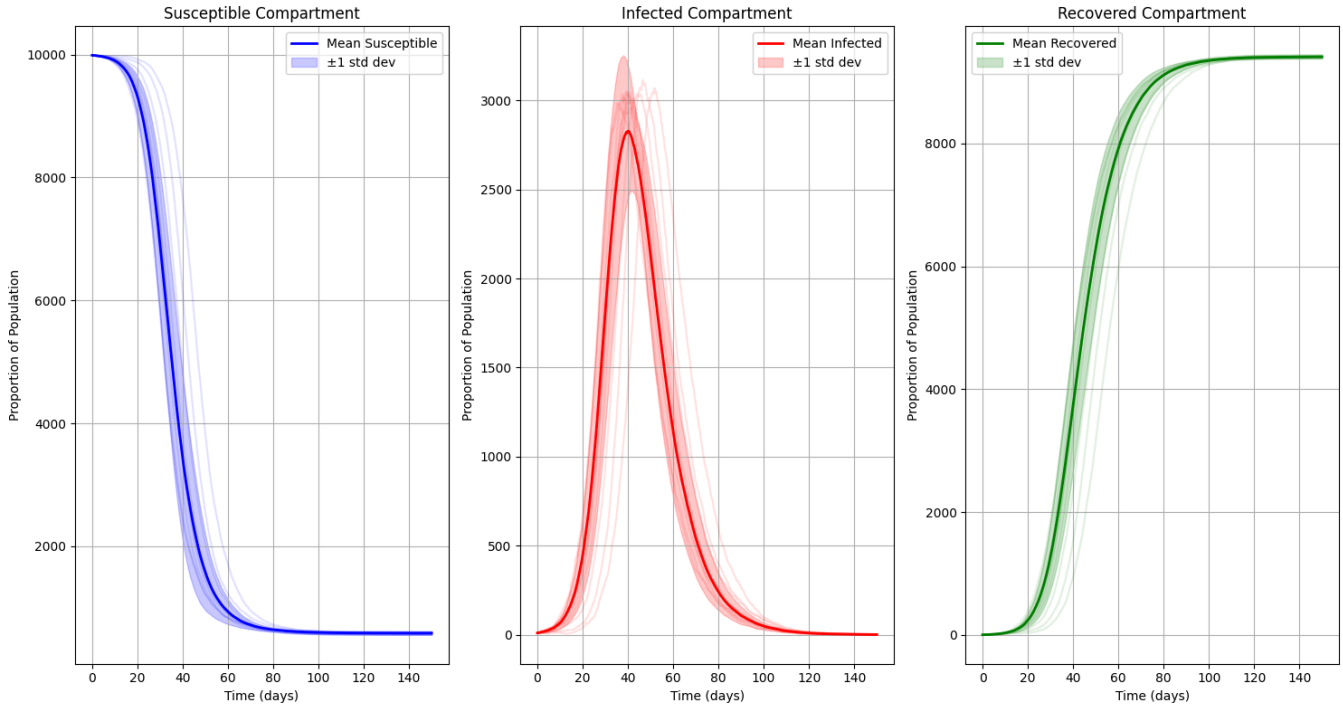
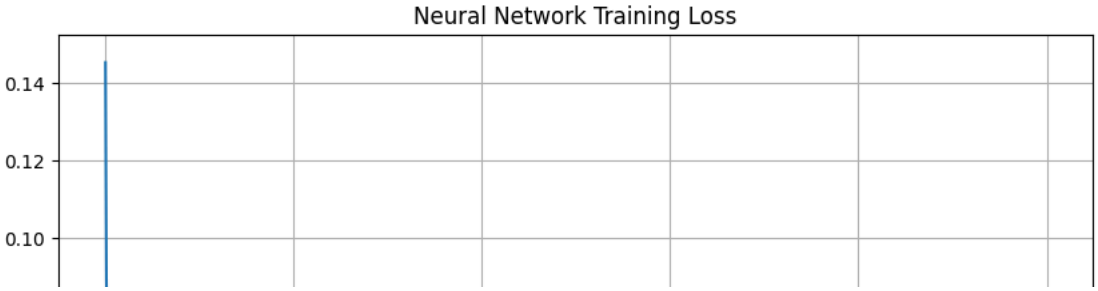
```
Running deterministic SIR simulation...
```

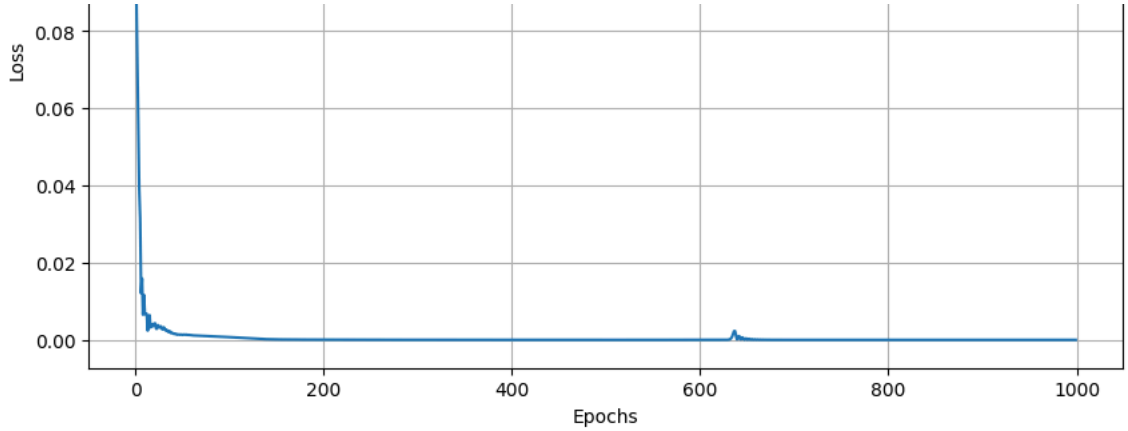



```
Running stochastic SIR simulation...
```

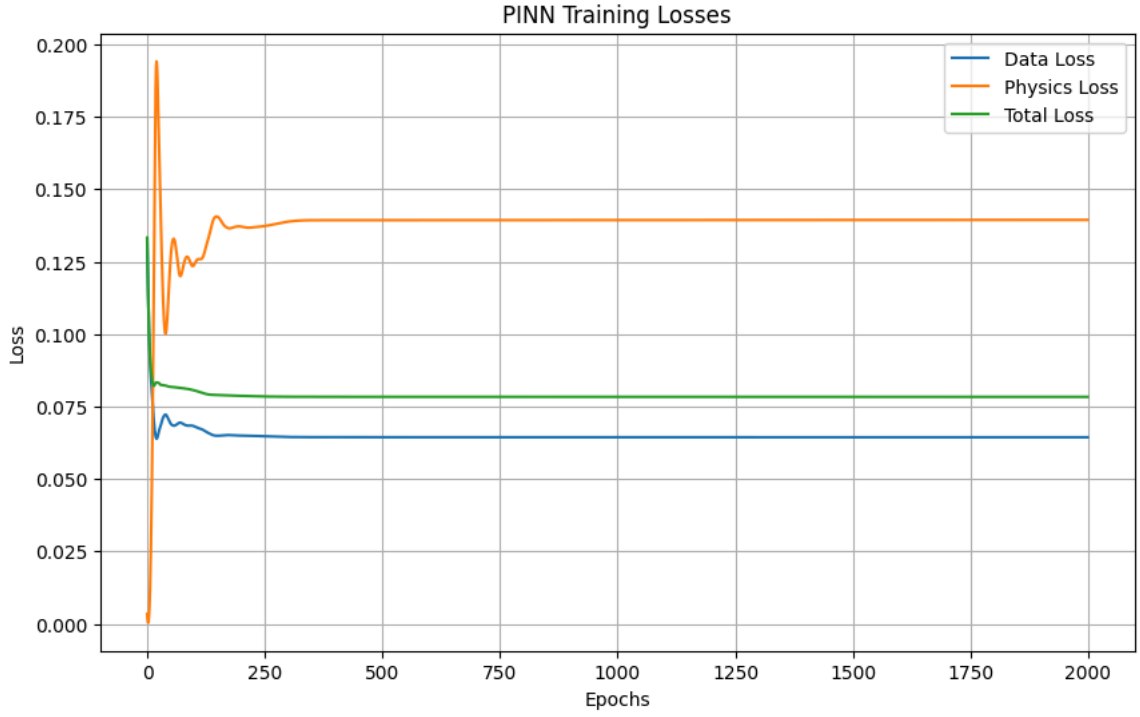



```
Preparing data for machine learning...
Training neural network SIR predictor...
Epoch 100/1000, Loss: 0.000724
Epoch 200/1000, Loss: 0.000053
Epoch 300/1000, Loss: 0.000016
Epoch 400/1000, Loss: 0.000007
Epoch 500/1000, Loss: 0.000004
Epoch 600/1000, Loss: 0.000003
Epoch 700/1000, Loss: 0.000003
Epoch 800/1000, Loss: 0.000002
Epoch 900/1000, Loss: 0.000002
Epoch 1000/1000, Loss: 0.000001
Neural Network Test MSE: 0.000006
```

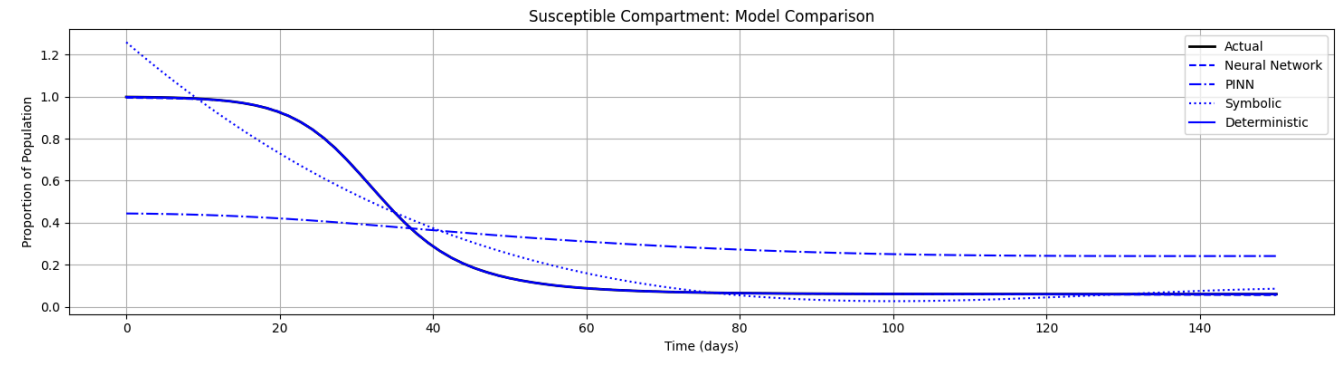


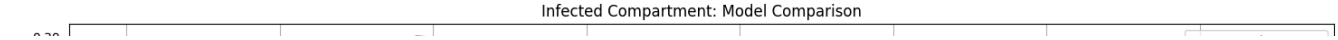


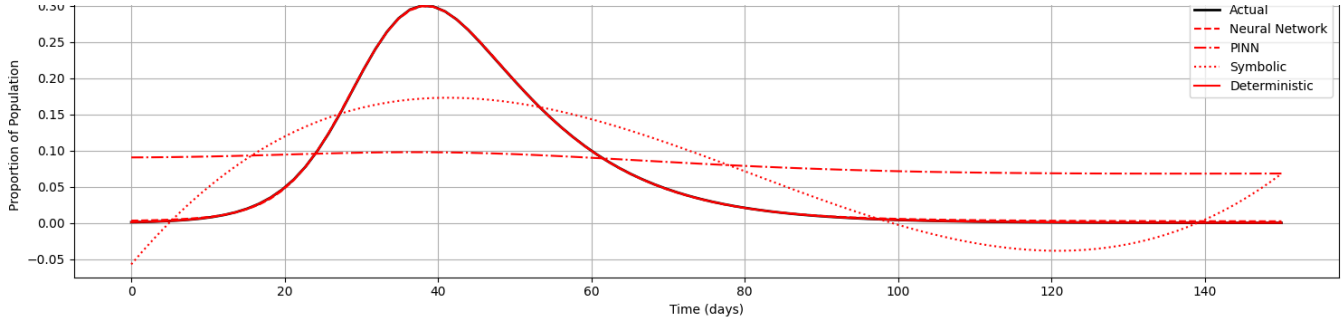

```
Training physics-informed neural network...
Epoch 200/2000, Data Loss: 0.064987, Physics Loss: 0.137112
Epoch 400/2000, Data Loss: 0.064437, Physics Loss: 0.139334
Epoch 600/2000, Data Loss: 0.064420, Physics Loss: 0.139391
Epoch 800/2000, Data Loss: 0.064415, Physics Loss: 0.139411
Epoch 1000/2000, Data Loss: 0.064413, Physics Loss: 0.139417
Epoch 1200/2000, Data Loss: 0.064412, Physics Loss: 0.139420
Epoch 1400/2000, Data Loss: 0.064410, Physics Loss: 0.139421
Epoch 1600/2000, Data Loss: 0.064408, Physics Loss: 0.139422
Epoch 1800/2000, Data Loss: 0.064406, Physics Loss: 0.139424
Epoch 2000/2000, Data Loss: 0.064401, Physics Loss: 0.139433
```

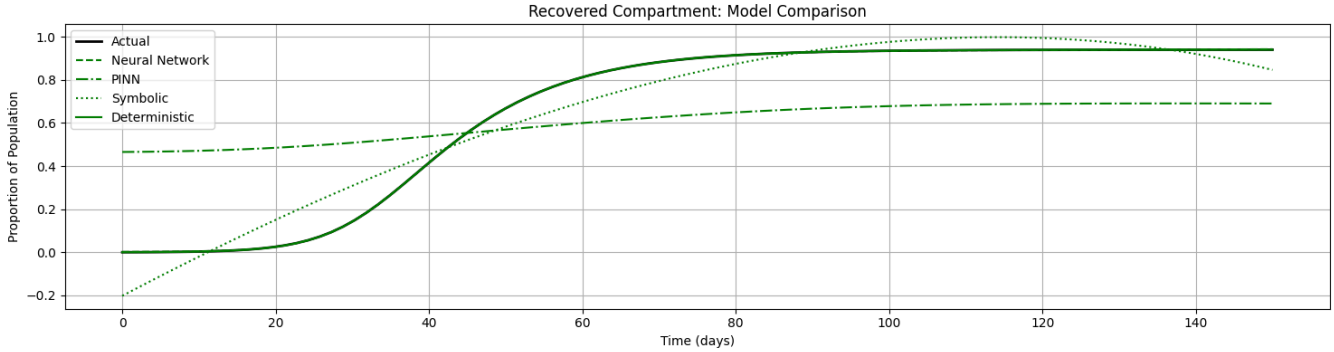



```
Performing symbolic regression...
Symbolic Expressions:
S(t) = -6.6658047312429e-7*t**3 + 0.000256775930765586*t**2 - 0.0313459634282324*t + 1.25971089526119
I(t) = 8.41820829962717e-7*t**3 - 0.000204692939697058*t**2 + 0.0125978771841923*t - 0.0572973086840753
R(t) = -1.75240356836692e-7*t**3 - 5.2082991068528e-5*t**2 + 0.0187480862440401*t - 0.202413586578596
Comparing all models...
Model Comparison Results:
            Model         S         I             R   Overall
3   Deterministic  0.000000  0.000000  0.000000e+00  0.000000
0  Neural Network  0.000003  0.000002  7.057049e-07  0.000002
2        Symbolic  0.007233  0.002685  6.977439e-03  0.005632
1            PINN  0.080320  0.007323  8.686265e-02  0.058168
```

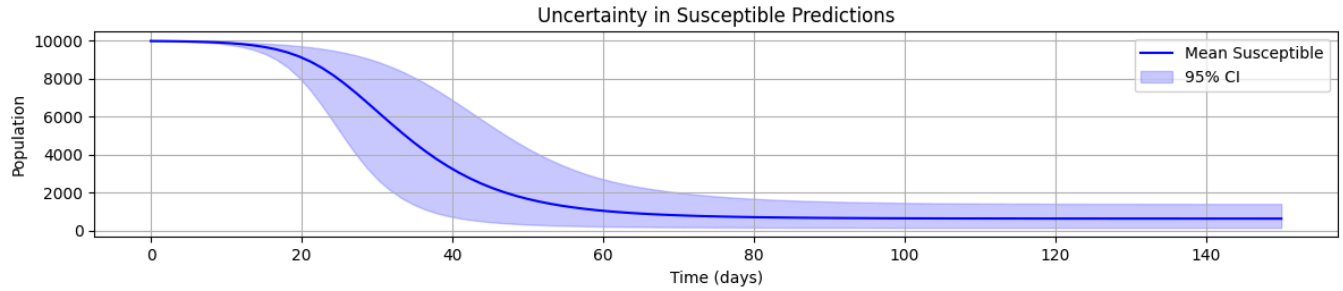


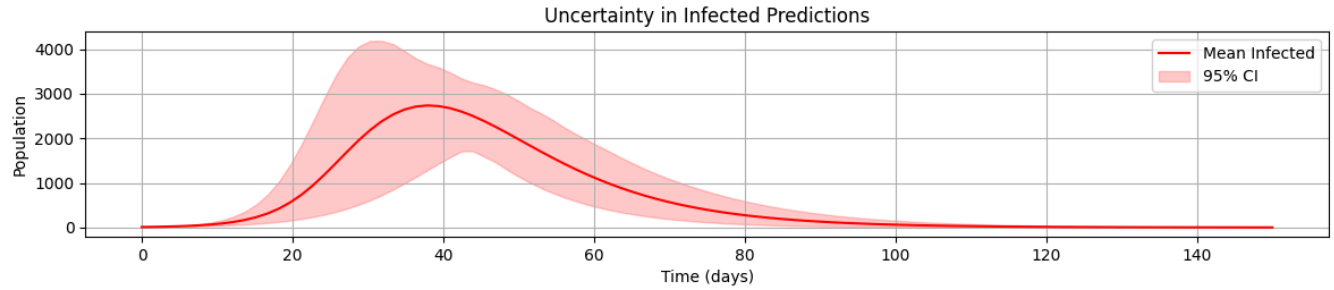


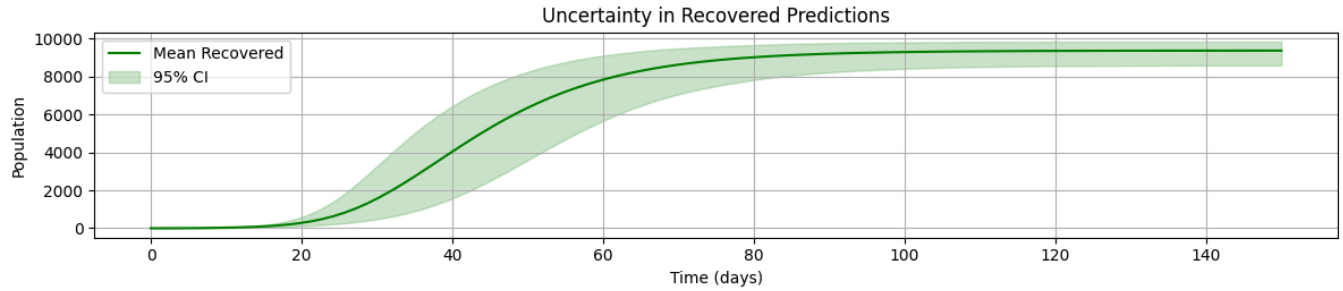





```
Quantifying uncertainty...
```








```
All analyses complete!
```