

## Modeling and Simulation, CS302

### Lab-6 (Part-2)

**Due Date: March 16, 2021 (Tuesday)**

This is the last lab on ODE model and hence on purpose is being kept open ended.

1. **(Modeling Malaria)** Read the chapter from the book on Modeling a persistent plague: Malaria. The following should give you an idea of how to proceed with your study.
  - (a) First construct the mathematical model. Think about all the assumptions that go into the model.
  - (b) Try to see if you can calculate the basic reproduction number  $R_0$  for the malaria model. The discussion of last lecture on next generation method will be useful.
  - (c) First analyze the model without any public health interventions. Discuss the observed behavior.
  - (d) Think of the possible health interventions. In your model include them systematically. You should use parameter values such that, they are in principle representative of the real scenario. Examine and discuss the role of different health interventions.
  - (e) Past few years we have observed Dengue outbreak at DA-IICT that lasts over a long time. The institute's administration, apart from advocating hygiene and preventive measures also does limited fumigation. Based on your model analysis do you think that this would have a significant effect on the Dengue outbreak on-campus? What would be your suggestions to the administration?