Project 1: Epidemiological Characteristics

STAT 244NF: Infectious Disease Modeling

1. For this project you have the option of working alone or in a pair. If you would like to have a partner but do not know who to ask, please let me know, and I will try to pair you up with someone else.

2. This will be a 3-5 page report which covers the 3 and 4 below. You will be assessed on how completely you cover the information detailed in 3 and 4 and how well you support your findings with appropriate resources. This project will lay the foundation for the second project in this class, which will be simulation-based.

3. Choose a disease of interest (list of suggested diseases)

    - COVID-19
    - Measles
    - Influenza
    - Zika
    - Dengue
    - Yellow fever
    - Ebola
    - HIV/AIDS
    - Gonorrhea
    - Tuberculosis
    - Chicken pox/varicella
    - Cholera
    - Diphtheria
    - Other - please talk to to me.

4. Once you have chosen your disease of interest, find out the following information about the disease. You will need to find at least 2 sources for each piece of information, either from peer-reviewed journals (think Google Scholar or similar search resource) or from a public health agency website like the Centers for Disease Control.

    - Source of infection (pathogen); should include whether it is viral, bacterial, parasitic, fungal, etc. and what the pathogen(s) is (are).
    - Mode of transmission
        - Respiratory
        - Sexual/blood
        - Other
    - Population of interest
        - Size
        - Demographics
        - Prevalence in the population/proportion susceptible
    - Risk of infection
    - Latent/pre-infectious period (how long? what time scale?)
    - What defines a case?
        - Diagnostic tests
        - Symptoms

  - Other?
- Incubation period (how long? what time scale?)
- Infectious period (how long? what time scale?)
- Reproductive number (should be greater than or equal to 1 in an outbreak)
  - $R = 1$, endemic
  - $R > 1$, epidemic
- Serial interval/generation time
- Immunizing infection
  - Does infection confer immunity?
- Recovery time/probability of recovery
- Mortality rate
- Seasonality
- Other additional challenges associated with the disease you are studying?