CS:4980 Computational Epidemiology, Spring 2020
Reading Response 1, Due in class on Tue, Jan 28

Notes: (a) Your submissions will be evaluated for correctness *and* clarity. Correctness is of course crucial, but how clearly you communicate your ideas is also quite important. Organize your thoughts first, write in full sentences, avoid grammatical and spelling errors, and follow standard rules of style for technical writing. (b) Unless you have a documented accommodation, no late submissions are permitted. You will receive no points for your submission if your submission is not turned in at the beginning of class on the due date.

These questions are based on the posted reading from the *The Atlantic* "The next plague is coming. Is America ready?" by Ed Yong.

1. As you read the article, keep track of all the infectious diseases that Yong mentions. To answer this question list any 10 of these diseases.

2. For many of the diseases mentioned in Yong's article, the Centers for Disease Control and Prevention (CDC) has online information on disease symptoms, prevention, treatment, and transmission. For example, this: `https://www.cdc.gov/vhf/ebola/index.html` is CDC's page on Ebola. Using CDC's online resources find three diseases from Yong's article that have different human-to-human transmission mechanisms. To answer this question list the three diseases, describe the transmission mechanism for each, and mention the source of this information.

3. Yong mentions "proclamations" made in the mid-20th century by eminent people about the imminent demise of infectious diseases. He goes on to say "Hindsight has not been kind to these proclamations." In one paragraph describe why according to Yong, despite the advances in vaccines, antibiotics, and healthcare in general, infectious diseases continue to be a major threat to humans.

4. One theme in this course is modeling infection control problems as *optimization problems* and designing algorithms to efficiently solve these. In an optimization problem, we minimize (or maximize) some objective function (e.g., the number of new infections, the number of individuals vaccinated), while meeting some resource constraints. Pick a situation described in Yong's article that, in your view, can be modeled as an optimization problem. Describe this optimization problem as precisely as you can by explicitly describing the objective function and the resource constraints.