

Incorporating Large Language Models in Public Health Education: A Paradigm Shift in Epidemic Modeling

Abstract: There is an immediate need for public health practitioners to incorporate mathematical modeling into infectious diseases decision making. This is demonstrated by a continued increase in the use of forecasting models by state and federal health agencies such as the CDC. However, the typical public health curriculum does not require mathematical modeling and programming of epidemic models. In my class, Outbreak Science and Public Health forecasting, one week will be devoted to the use of Large Language Models to construct epidemic models that can incorporate temporal public health decisions. The only restriction is that students ask the LLM to construct a compartmental model, a typical model used in infectious disease modeling. Students will be assessed on the feasibility of the model, the ability of the model to include practical public health decisions or interventions, and the student's ability to apply what they have learned in class to describe the model to others. In addition to the instructor, the Chief of the Division of Infectious Diseases and Chief Infection Control and Prevention Officer from the Lehigh Valley Health Network have agreed to evaluate student proposals. This exercise represents a paradigm shift in public health education and how LLM tools can be used to construct epidemic models that are impactful and improve evidence-based public health decision making.

The Goal: of this assignment is to produce an epidemic model that can address a healthcare issue using---entirely---ChatGPT. This is an experimental assignment and so I expect that there will be hiccups here and there.

Assignment: Include, if possible, (1) the ChatGPT conversation that you had to produce your model; (2) the python code to generate the model; (3) a brief exposition on the goal for your model and why you chose your specific modeling idea; (4) a plot or numerical description of the model output: this could be any combination of visuals, tables, etc; (5) a description of the model output presented in (4).

The assignment can only use ChatGPT (as opposed to other large language models), should be no longer than two pages at most. i don't expect that you will fill two pages---but maybe. You are restricted to using a compartmental model for this assignment.

Evaluation: Your model will be evaluated by prof m on the following criteria.

1. Did the assignment address the above 5 points?
2. Was the assignment a compelling model that could aid real-world healthcare or public health goals?
3. Could a team of physicians benefit from model output supposing that your model was fit to real data?

The top 6 assignments will be emailed to the Chief of the Division of Infectious Diseases and Chief Infection Control and Prevention Officer from the Lehigh Valley Health Network to rank them by real-world application.