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BAN 502

Module 1- Assignment 1

Predicting COVID-19

Predictive analytics has become increasingly useful in medicine and healthcare. Using information from past patients, analysts can build prediction models. These models can then be used to increase the accuracy of diagnoses, help preventive medicine and public health, provide physicians with answers about individual patients, and predict insurance product costs. Most recently, predictive analytics models have helped researchers forecast the risk of testing positive for COVID-19. Additionally, they have helped researchers better understand how respiratory droplets contribute to the spread of COVID-19.

Researchers at Cleveland Clinic have developed a type of predictive model, called a nomogram, that can predict whether or not a person is likely to test positive for COVID-19. The model uses data from all patients tested for COVID-19 at Cleveland Clinic. The patients’ electronic medical records were transformed, using statistical algorithms, into a nomogram. The findings corroborated previous study findings, as well as, raised new questions. For example, the study showed that patients who received the pneumococcal polysaccharide vaccine and the influenza vaccine are less likely to test positive for COVID-19. Additionally, patients who are taking melatonin, carvedilol, or paroxetine are also less likely to test positive. Other factors that indicate that a patient is less likely to test positive for COVID-19 are if the patient is older in age, male, and of low socioeconomic status. These findings corroborate previous research findings and give hope to the medical community for future treatment options.

In addition to predicting the likelihood of testing positive for COVID-19, predictive models can also help researchers predict how the disease will spread. Research has shown that viruses, like COVID-19, are spread via respiratory droplets released when a person sneezes, coughs, or talks. It is important to understand the characteristics of these droplets. A team of international researchers used existing models to study the size, span, and lifespan of respiratory droplets under different environmental conditions. They then developed a predictive model to forecast the early spread of respiratory viruses (i.e., COVID-19). The model uses a fundamental approach to study collision rate theory. Collision rate theory “examines the interaction and collision rates of a droplet cloud exhaled by an infected person with healthy people.” The researchers discovered that respiratory droplets can travel 8 to 13 feet before evaporating. This finding does not account for weather conditions such as wind, temperature, and humidity, which prolong the droplet’s lifespan. Current pandemic guidelines state that 6 feet of distance is safe when not wearing a mask. This study suggests that 6 feet is not far enough, and this model can be used to inform public health policies in the future.

With the help of predictive analytics, the healthcare industry can be better prepared when a pandemic occurs. Additionally, physicians will be better equipped to advise individual patients on proper treatments. Research focused on predicting the risk of testing positive for COVID-19 will help physicians and patients form preventative care initiatives. Research focused on predicting the spread of COVID-19 will assist public health policies on how to best contain the spread of disease. The importance of using predictive analytics models in the healthcare industry will only continue to grow in the future.

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