As of March 2020, the World Health Organization declared a mysterious Wuhan epidemic to be an international pandemic. Borders have closed, travel is limited, and most of the public in America has been given a “stay-at-home” order at least once. Many citizens feel that life as they know it is forever changed. The virus, known as Coronavirus or Covid-19, can cause fever, coughing, sore throat, shortness of breath, severe fatigue, and a plethora of other symptoms. Those at highest risk tend to be immunocompromised, such as individuals with diabetes, asthma, liver disease, and more.

During this pandemic, hospitals have been overflowing with Coronavirus patients, and many are running out of supplies and/or room. Unrelated surgeries and appointments are being postponed, and hospital staff are feeling overwhelmed, sometimes to the point of mental breakdown.

Because this virus is so new, there aren’t any prepared regulations and processes to optimize treating these patients. To alleviate the stress and chaos of current events within hospitals, as well as give higher-level treatment and minimize casualties, our team has developed a surface-level program to determine the supplies and staff necessary for the average amount of patients in hospitals in the south central region of Wisconsin, depending on the severity of the patients’ health.

The problem data is pseudo randomly generated by code based on the total supplies and staff in hospitals in the south central region of Wisconsin (*Wisconsin Department of Health Services*). More severe virus patients will require more care and resources than those with mild symptoms. Logically, treating severe patients first would serve this goal. A multiperiod planning linear program with an objective of minimizing cost is used to display the constants, variables, etc. necessary for the overall problem, along with the levels of severity a patient can have, which has been simplified to four levels: no Coronavirus symptoms/symptoms not requiring hospitalization, mild symptoms that require fluids and monitoring the patient in the hospital, moderate symptoms that require more attention and a ventilator, and severe symptoms that require a ventilator and has additional life-threatening complications. Afterwards, a max flow linear program is used to see the capacity of each treatment path possible. The overall model takes into account the following assumptions:

* CDC data on hospitalization applies to the south central region of Wisconsin.
* The probability that a Covid patient requires mechanical ventilation in all of Wisconsin is the same for the south central region of Wisconsin.
* There are no deaths.
* No patient discharges from the hospital besides severity 1 patients.
* No patient changes severity during the observed week.