The novel disease COVID-19 is spreading rapidly throughout the US, including Washington State [1].

The number of active COVID-19 infections in Washington is projected to exceed current capacity of Washington hospitals [1]. Overwhelming hospitals will likely increase the death rate for the disease.

Social distancing will help delay the shortage, but many Washingtonians continue to leave home.

Two other ways to delay the bed shortage are:
1. Add more beds to Washington hospitals
2. Hospitalize fewer COVID-19 patients (i.e. let less serious cases self-isolate)

Neither solution is perfect, but mathematical models can inform which will have a greater effect on delaying a bed shortage.

### Questions
- When will Washington run out of hospital beds for COVID-19 patients?
- How will decreasing the proportion of COVID-19 patients that are hospitalized alter our projection?
- How will increasing the number of hospital beds alter our projection?

### Results
Hospital bed capacity will be exceeded around May 5th: May 2nd – May 9th if we assume 5% error in parameters.

Adding 50% more hospital beds only delays shortage 3 extra days (May 8th)

Hospitalizing 50% fewer patients delays shortage 6 extra days (May 11th)

### Conclusions
- COVID-19 prevalence is currently growing exponentially in Washington.
- If current rates continue, a bed shortage will occur around May 5th (May 2nd – May 9th).
- Decreasing COVID-19 hospitalizations, such as by having less serious cases self-isolate, delays bed shortage more than the same increase in bed counts.

### Continued Research
Many asymptomatic individuals spread COVID-19. ASIR models were recently developed to account for this behavior and we are attempting to improve their fits to Washington data (see below).