Our Data Guide

We built this model to provide the public, health care leaders and policy makers with a better understanding of hospital bed capacity across the United States. We have run the numbers not just nationally, but for each Hospital Referral Region — 305 local hospital markets in the country. By making this information available on such a granular level, we can showcase which regions will be particularly stressed as coronavirus infections rise, and an more and more people need to be hospitalized.

Our model offers two main levers framing the bed capacity outcomes: Users can select the percentage of the population that will be infected with SARS-CoV-2, and they can select in which time frame this percentage of the total population of the selected region will be infected. For example, our pre-set when first clicking on a Hospital Referral Region shows hospital bed capacity for a scenario in which x percent of that region's population are infected in y months.

When we first published our model in collaboration with ProPublica, we chose nine main scenarios on which to focus: A population infection rate of 20 percent, 40 percent, or 60 percent, each modeled over either 6, 12 or 18 months.

Our original infection rate scenarios are based on estimates by leading epidemiologists such as Harvard's Mark Lipsitch, who predicts that 20 to 60 percent of the population will get infected with the novel coronavirus over the course of the pandemic. Our original time stamps – 6, 12 or 18 months – are based on the assumption that it will take about 18 months for a vaccine to be widely available (if there will be a vaccine.) These scenarios allow us to explore the impact of mitigation efforts such as physical distancing — which help us keep the infection rate lower for longer — up to the earliest time point when we could have an additional measure — the vaccine or a treatment — to bring down hospitalizations due to COVID-19.

Calculating Hospitalization Rates

Based on the evidence available from Wuhan, including hospitalization rates and information on how age affects both hospitalizations and ICU cases, our model assumes a 19% hospitalization rate in those under 65 and a 28.5% hospitalization rate in those over 65. We applied these same rates to our hospitalized totals to determine ICU rates, which means that from the overall infected population those under 65 had a 3.6 percent probability to end up needing ICU care, and those 65 and older had an 8.1 percent probability to need ICU care.

Given the challenges with identifying mild cases, it is possible that these percentages overestimate the proportion of severe cases. Some more recent studies show lower hospitalization rates; others show much higher rates. In general, this helps us highlight that this model serves as a guide in times of uncertainty — there are no perfect numbers, so we are using the best evidence available, and will update our models as better information emerges.

Calculating Length of Hospital Stay

Also looking at Wuhan data, we determined an average hospital stay of 12 days. Given a 12-day length of stay and the time frame selected via the slider, we determined the necessary capacity to treat all patients in that time period and compare it to the available capacity. We compared needed capacity to available capacity (total beds multiplied by average occupancy) and to potential available capacity (assuming a 50% reduction in occupancy).

Below is a data dictionary that further explains the model.

Questions? E-mail us.

Data Dictionary

HRR – Hospital Referral Region (HRR), specifying a market within which people generally go to the same hospitals

Total Hospital Beds – Count of all hospitable beds within an HRR that are set up and staffed

Total ICU Beds – Count of all ICU beds within an HRR that are set up and staffed

Available Hospital Beds – How many hospital beds are unoccupied at any given time, on average

Potentially Available Hospital Beds – How many beds could be available if occupancy rate was reduced by 50% for non-COVID patients; in other words, how many beds would be available if 50 percent of used beds could be freed up

Available ICU Beds – How many ICU beds are unoccupied on average

Potentially Available ICU Beds – How many beds could be available if occupancy rate was reduced by 50% for non-COVID patients; in other words, how many beds would be available if 50 percent of used beds could be freed up

Adult Population – How many people over the age of 18 living within the HRR

Population 65+ – How many people over the age of 65 living within the HRR

Projected Infected Individuals – How many individuals over the age of 18 are expected to get infected with COVID-19 over the entire course of the pandemic

Projected Hospitalized Individuals – How many individuals over the age of 18 are expected to need hospitalization due to COVID-19 over the entire course of the pandemic

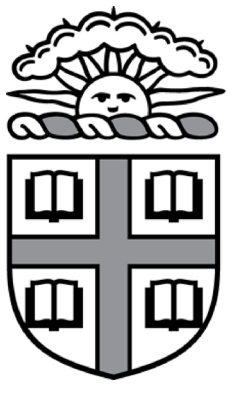
Projected Individuals Needing ICU – How many individuals over the age of 18 are expected to need ICU care due to COVID-19 over the entire course of the pandemic

Hospital/ICU Beds Needed, X Months – How many hospital/ICU beds would have to be available to care for all patients requiring hospital care within X months

Percentage of Available Hospital/ICU Beds Needed, X Months – What percentage of available hospital/ICU beds would need to be committed to COVID patients to care for all patients in X months

Percentage of Potentially Available Hospital/ICU Beds Needed, X Months – What percentage of potentially available hospital/ICU beds would need to be committed to COVID patients to care for all patients in X months

Percentage of Total Hospital/ICU Beds Needed, X Months – What percentage of all hospital/ICU beds would need to be committed to COVID patients to care for all patients in X months



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