First look at the outcomes of COVID-19 patients in NY hospitals

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On March 1, New York City confirmed its first case of SARS-CoV-2 infection. By the end of the month, thousands were infected, and hospitals were struggling to manage the influx of patients. On Wednesday, JAMA published an analysis of the outcomes of thousands of patients who ended up at a large hospital system in the city and surrounding areas. While the data is annoyingly incomplete, it does provide a broad overview of how the pandemic is interacting with the health demographics in the United States.

Some of this is expected, as the sorts of pre-existing conditions that exacerbate COVID-19—obesity, hypertension, and diabetes—cause problems here. The study also suggests some dramatically bad outcomes for older patients who ended up on ventilators, with 97 percent mortality for those over 65. But the study period ended before the outcomes of most patients could be tracked, so this number has to be treated with significant caution.

At admission

The work is based on the electronic patient records from the Northwell Health hospital system, which has a dozen hospitals in New York City and the surrounding suburbs. The researchers (Safiya Richardson, Jamie S. Hirsch, and Mangala Narasimhan) pulled out the records of anyone with a confirmed SARS-CoV-2 infection from the period between March 1 and April 4 of this year. This produced a study population of 5,700 patients, which is quite large. However, the study cut off tracking the patients on April 4; if a case hadn't resulted in discharge or death by then, the outcomes couldn't be analyzed. Follow-ups for those who were discharged were also limited, with the medium length being only four days.

Because the case level went up dramatically over the course of the month, there were only outcomes for less than half of the patients who started the study (2,643 of them, to be exact). So while the study provides some insight into the factors that may influence whether someone's COVID-19 symptoms are bad enough to get them sent to a hospital, most of the participants were still in the hospital when the study period ended. This could potentially distort the numbers, especially those regarding survival, since there was an end point for everyone who died during this period.

What can we say about the demographics of US cases of COVID-19 that are severe enough to warrant hospitalization? As seen in other countries, the population skews considerably older, with a median age of 63. (Although the age range runs from a low of less than a year old to a 107-year-old patient.) More males than females had severe problems, as the total population was under 40 percent female.

In general, the people had some significant health problems before the virus sent them to the hospital. Over half of them had hypertension; over 40 percent were clinically obese; and a

third had diabetes. A measure of their general health called the Charlson Comorbidity Index indicates that the people with this level of problems typically have roughly even odds of living another decade. In contrast, only about 1 percent had an infection with another respiratory virus, indicating that SARS-CoV-2 wasn't generally taking advantage of damage caused by a previous infection.

Post-hospitalization

So what happens to these patients once they're brought in to the hospital? Among the 2,634 patients who had died or were discharged, a bit over 14 percent ended up in the intensive care unit. Just under that (12.2 percent) required mechanical ventilation, and just over 3 percent needed dialysis. Kidney problems appear to be a regular issue among a subset of patients with COVID-19 symptoms. The presence of diabetes (which also causes kidney problems) as a pre-existing condition increased the frequency of a need for dialysis.

The eye-opening figures come when the mortality of these patients were considered (which was again, limited to the population that had died or been discharged). Those who had been put on the ventilator among this population died 88 percent of the time. For those older than 65, the mortality reached a staggering 97 percent. For those who didn't need a ventilator, the mortality rate was 27 percent for those over 65 and 20 percent for those below. Nobody under the age of 20 died.

It's important at this point to reiterate the issue pointed out above: most of the patients in the study weren't included in this part of the analysis, because they were still in the hospital when the study period ended. Tracking all these patients until they either die or are discharged will almost certainly lower the mortality rates. This was also the first month of treating COVID-19 patients, and it's possible that

the hospital staff will improve with greater experience with the disease. Still, results like these seem to have caused some facilities to rethink the use of ventilators.

Overall, this study largely reinforces findings from other countries: men have more problems than women, the elderly are hit extremely hard, and pre-existing conditions greatly enhance the risks posed by SARS-CoV-2. They also drive home the big fear regarding COVID-19: a sizable percentage of the patients who require hospitalization need extensive stays and aggressive interventions, enhancing the danger that the pandemic can overwhelm our healthcare system. It’s only by limiting the number of people infected at once that our hospital system is able to handle the number of patients that need this sort of attention.

But it’s also important to note that this study doesn’t answer some critical questions. We’re still getting confused and somewhat contradictory results regarding how many of the people infected eventually need hospitalization. And we don’t really know the mortality rate among the ones who do. By this point, at the end of April, the same researchers would undoubtedly be able to know the full history of everyone admitted during the study period and thus provide a better measure of that—and that work has almost certainly already been done. We’ll probably have to wait a few more weeks, however, for the results to make their way through peer review.

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