# Vanderbilt COVID-19 Report for Tennessee: Statewide Hospitalizations and Mobility

*July 9, 2020*

Transmission of COVID-19 across Tennessee has accelerated in the past several weeks, and the number of hospitalized COVID-19 patients has correspondingly increased. The transmission number (R) has remained around 1.2, which means that cases are increasing, as we reported on July 6.

Due to both testing result delays and the normal course of the viral illness, many cases being reported over the past week reflect infections that occurred as many as 2–3 weeks ago. Of the approximately 2,500 cases reported on July 8, for example, over half had their tests performed on or before July 2. Similarly, hospitalizations resulting from these infections may continue to increase in the weeks ahead.

In this report we provide data and analysis on the number of COVID-19-related hospitalizations in Tennessee, how they have grown, and how that growth varies by region. A concern with this rate of growth in cases and hospitalizations is that the health system may become stressed and unable to accommodate an increase in COVID-19 cases while also providing care for other patients requiring hospitalization. To further inform our analyses of hospitalizations, we also provide data on the median age of cases recently infected (age is a leading risk factor for COVID-19-related hospitalizations) and about increasing mobility across the state (tracked using anonymized cell phone data).

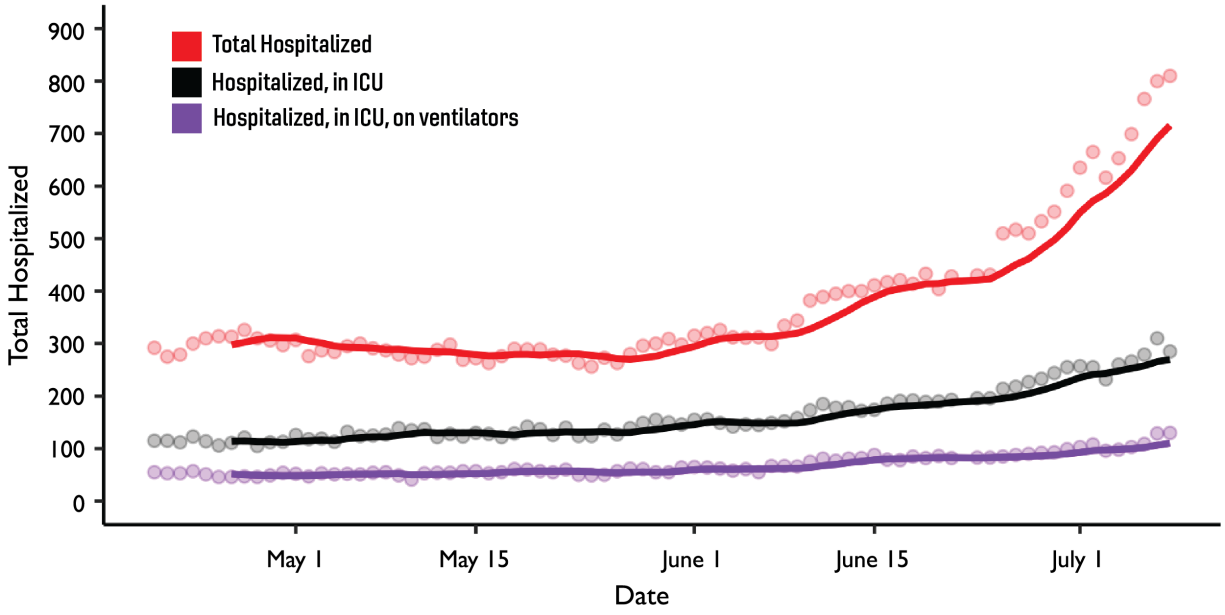
Hospitalizations have increased across Tennessee, with particularly steep percentage increases in Northeast Tennessee and Upper Cumberland, although overall numbers of hospitalized COVID-19 patients remain highest in the largest metro areas of Middle Tennessee and the Memphis Delta.

COVID-19 IN TENNESSEE | *Week of July 8, 2020*

## Statewide Hospitalizations

The charts below show the number of hospitalizations in Tennessee, along with the number of patients hospitalized who are in intensive care and those who are on ventilators. Charts reflect data reported through July 8, 2020.

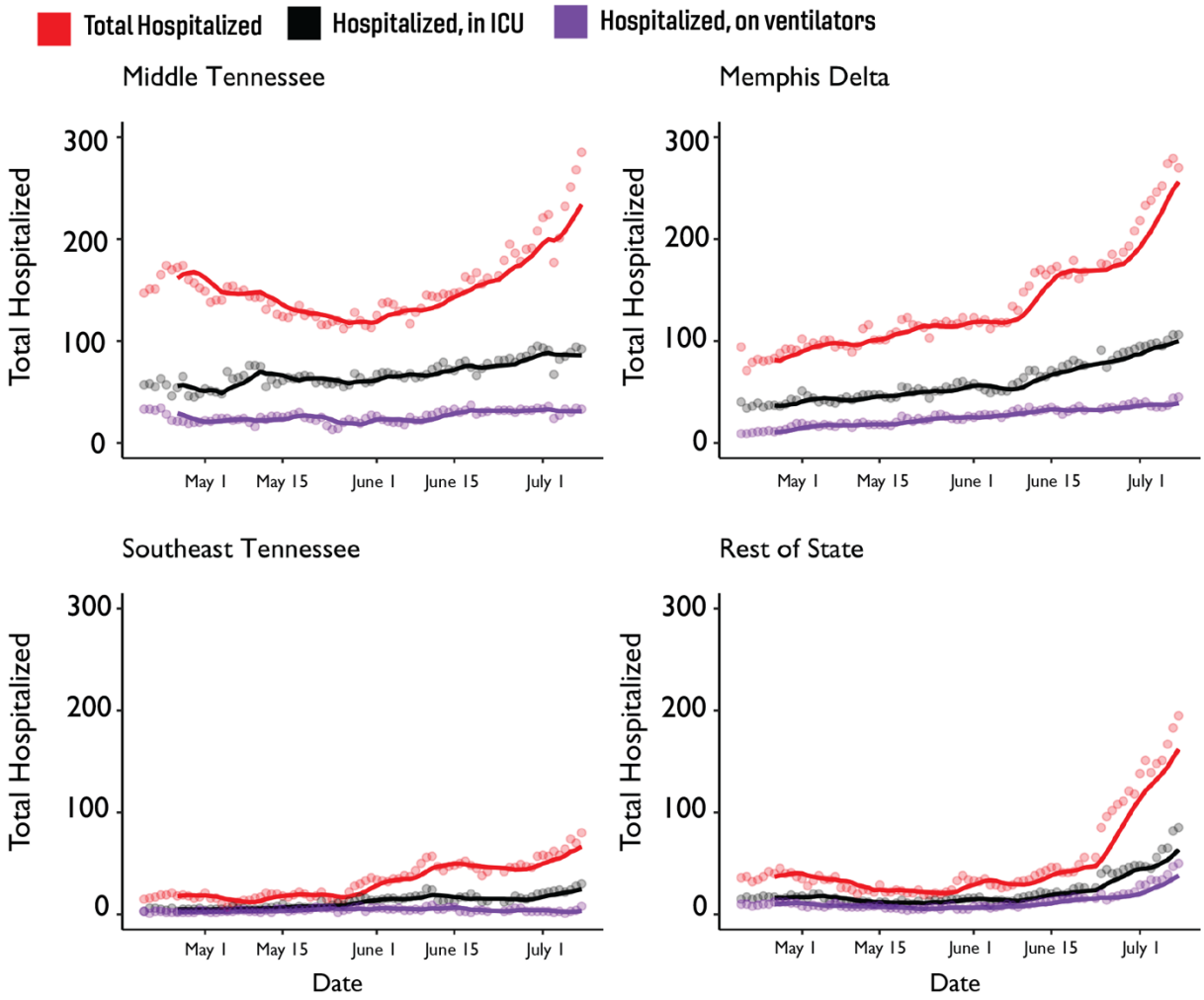
Total Hospitalizations
(estimated as of July 8, 2020 )
**808**



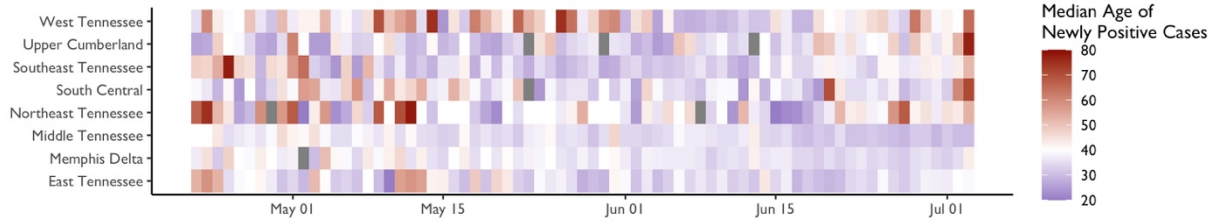
## Hospitalizations by Region

**COVID-19 IN TENNESSEE** | *Week of July 8, 2020*

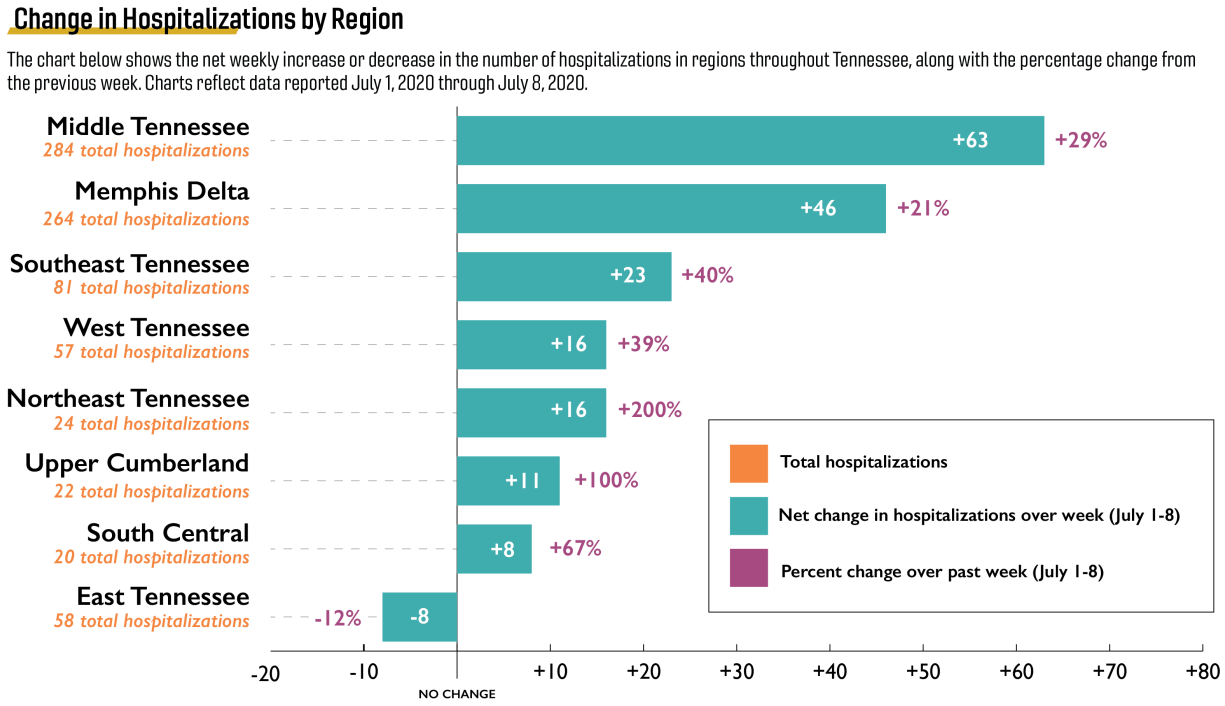
The charts below show the number of hospitalizations in Tennessee, along with the number of patients hospitalized who are in intensive care and those who are on ventilators by regions throughout Tennessee. Charts reflect data reported through July 8, 2020.




One potential explanation for differences in hospitalizations and hospitalization rates across the state is variation in case mix. We are tracking the age profile of cases by region using "heat maps" of the median age of newly identified cases tested on each day. The heat map below shows that half of all new cases in the Middle Tennessee region as of July 1 were roughly aged 30 or below. But in East Tennessee, nearly half were above age 40 and in West Tennessee, half were above age 45.



Differences in growth of hospitalizations across the state, and particularly steep increases in Northeast Tennessee and the Upper Cumberland regions, may be reflective of these differences in age profiles of cases over the past few weeks.




## Statewide Mobility

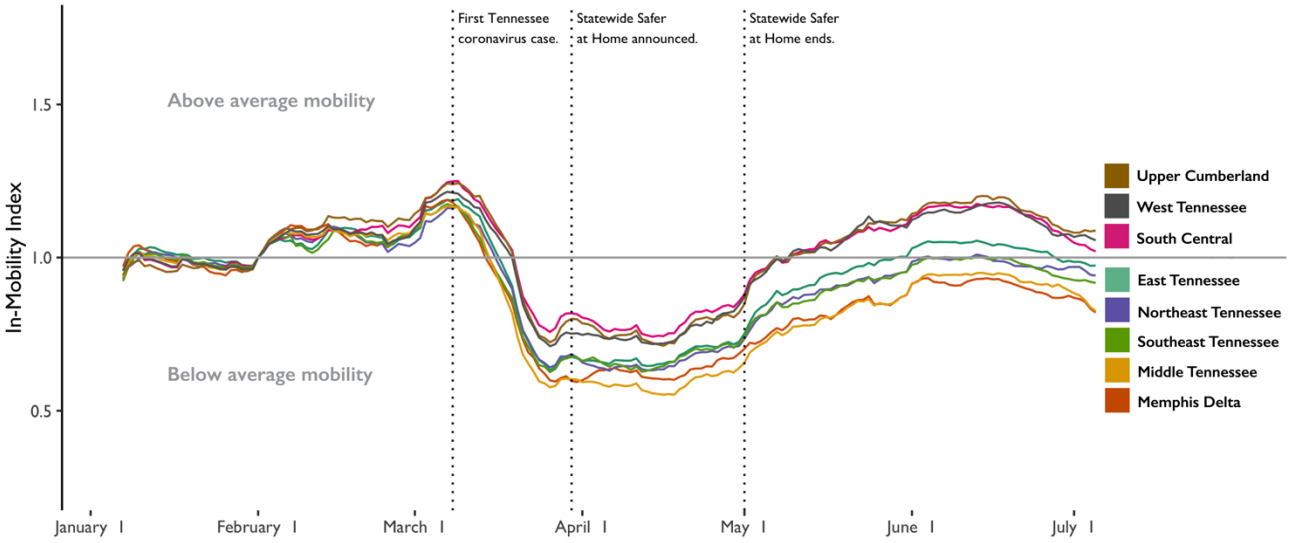
As mobility increases, it is not unexpected that virus transmission will increase and lead to increased hospitalizations. In other words, as more people move around, visit businesses and places of interest, and are closer to more people, transmission of the virus becomes more likely. In some parts of the state, mobility before the July 4 holiday approached levels last seen prior to the first COVID-19 case being identified in Tennessee. Again, this differs by location.

The chart below shows mobility through July 5th: a detailed explanation of our mobility measures is available in our May 28 report.

## Mobility around Tennessee

COVID-19 IN TENNESSEE | *Week of July 8, 2020*

The chart below show how people moved into specific regions of Tennessee over time, using anonymized cellular phone data. The horizontal black line indicates an index value that reflects the mobility at the same time in 2019. When the colored lines are below the black line, for example, that indicates below average travel to into those regions.




### Conclusion

On July 8, there were an estimated 808 hospitalized COVID-19 positive patients statewide, an increase of 173 over 7 days. In our April 24 report we forecast that if R began rising back to 1.2 starting May 1, we would reach 1,000 hospitalizations after 74 days, on or about July 14. Modeling based on data reported through July 8 remain consistent with the state reaching that threshold within the next two weeks.

Increases in hospitalizations are a lagging indicator that there is widespread transmission in the community and thus a potential trigger to make decisions about intervention. Importantly, hospitalizations come after new cases are reported, and will continue to increase for a period even after public health measures are in place, so the decision to intervene should occur before stress on health care capacity becomes critical. Our modeling also accounts for increases in case detection as the state has seen record numbers of tests over the last few weeks. However, despite this increase, the recent increase in test processing times means that the effects of successful mitigation efforts might not show up in reported case totals for 2-3 weeks. Health care system capacity and the associated ability to care for patients remains an important metric Tennesseans and their leaders should focus on to prevent as many deaths and serious illnesses as possible.