

# Vanderbilt Dept. of Health Policy COVID-19 Report for Tennessee: The Pandemic Is Spreading Beyond Large Metro Areas

Aug. 3, 2020

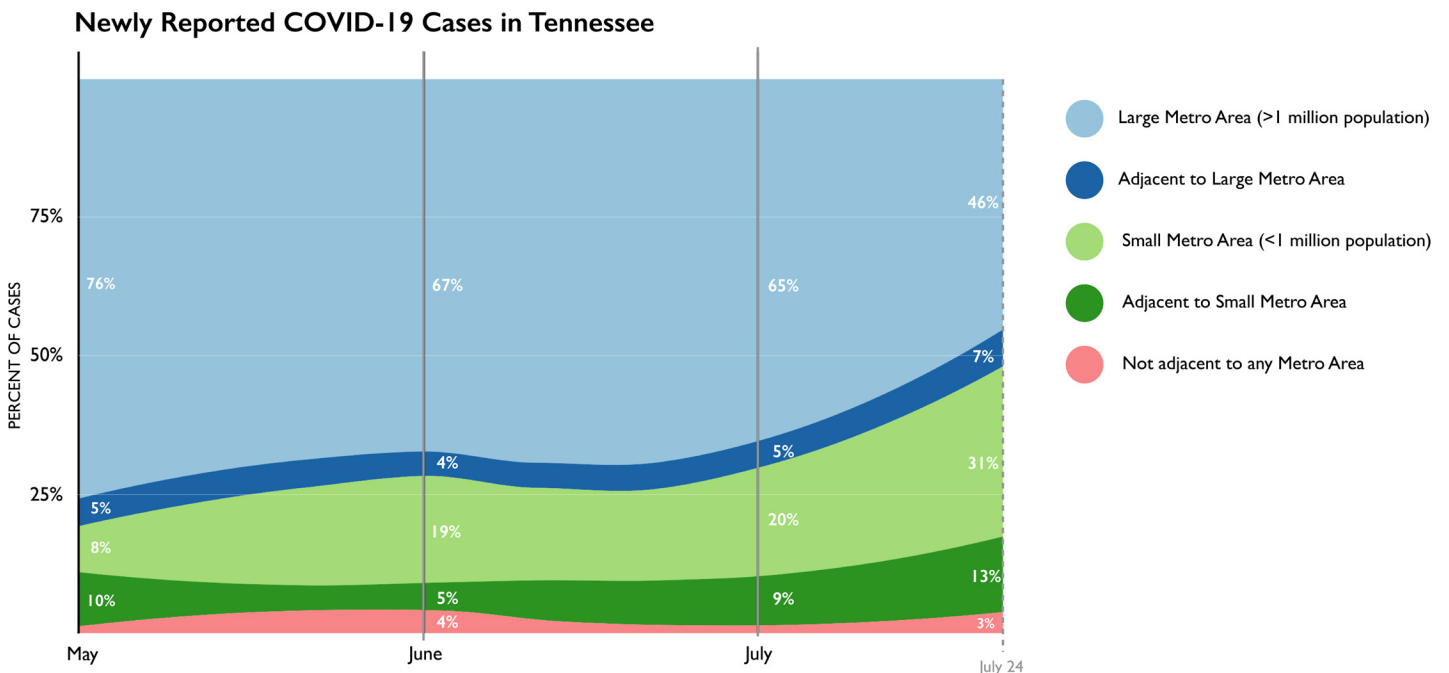
The COVID-19 pandemic is playing out in very different ways across the country and state by state. What was initially an outbreak concentrated in large urban areas has moved into more rural communities with fewer health care resources. Understanding this shift is critical for targeting resources and preparing to address increasing needs for services and effects on rural health care systems. As a largely rural state, Tennessee stands to be among the states most affected by this shift.

This report examines trends in reported coronavirus cases and hospitalized patients with COVID-19 in Tennessee by type of community setting. These settings include: large metro areas of 1 million or more residents (i.e., the Nashville and Memphis regions), smaller metro areas less than 1 million people (this category includes other Tennessee cities like Chattanooga, Knoxville, Clarksville, Jackson and the Tri-Cities area), rural areas adjacent to large and small metro areas, and rural areas not adjacent to any metro areas. Specifically, we consider the percentage of cases occurring in each setting over time, as well as the proportion of hospitalized patients in facilities located in each setting.

The two panels of Chart 1 summarize the percentage of cases and hospitalizations by location type over time. As of the date of this report, the majority of new coronavirus infections in Tennessee are originating in communities outside the largest metropolitan areas surrounding Nashville and Memphis. This case profile is in stark contrast to earlier in the pandemic, when three-quarters of new infections were concentrated in the Nashville and Memphis metro areas. It is worth noting that this change has occurred in the context of high overall numbers of new reported

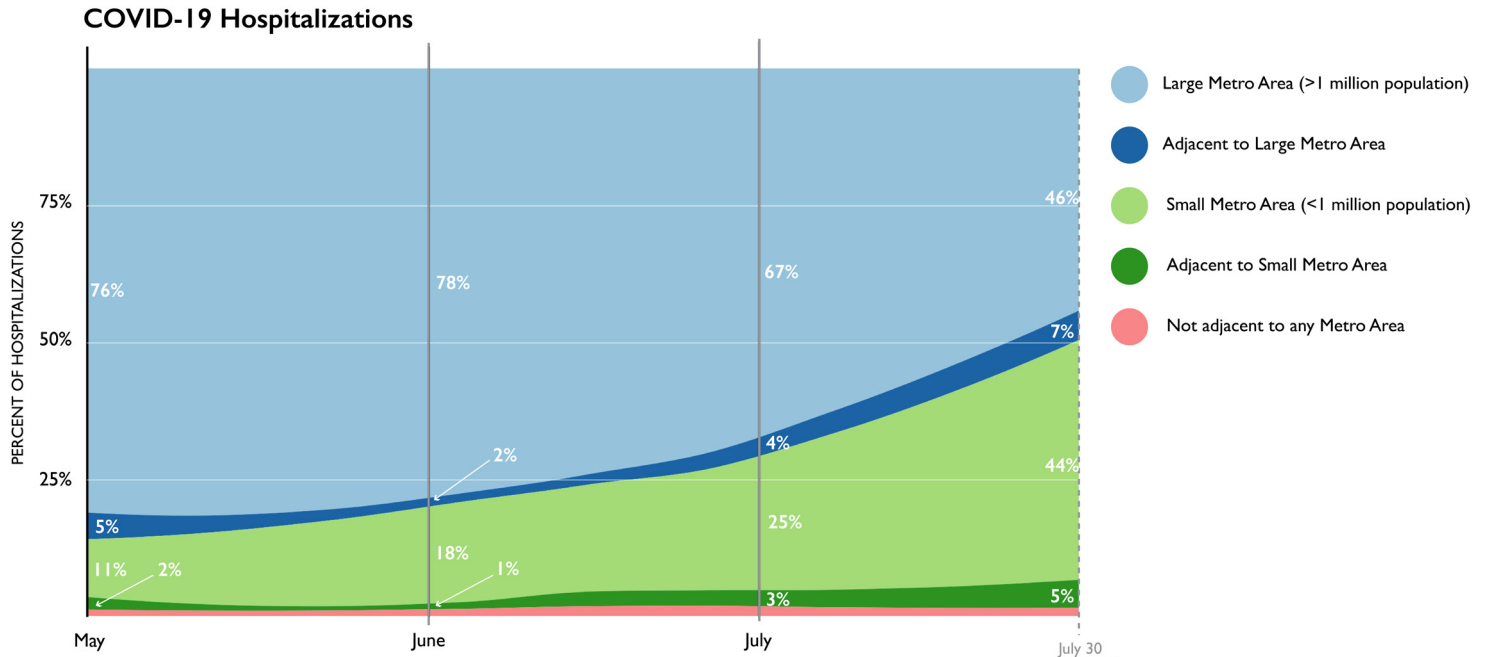
## Chart 1

The charts below and continued on Page 2 show the percentage of newly reported cases of COVID-19 in Tennessee (top) and COVID-19 hospitalizations (bottom) by type of community setting, including large metro areas with more than 1 million residents, small metro areas with fewer than 1 million residents, areas adjacent to each of those metro areas and areas of the state not adjacent to any metro area. Due to testing report delays, the data for newly reported cases is through July 24.



## Chart 1, cont.

The chart below shows the percentage of COVID-19 hospitalizations (bottom) by type of community setting, including large metro areas with more than 1 million residents, small metro areas with fewer than 1 million residents, areas adjacent to each of those metro areas and areas of the state not adjacent to any metro area. Hospitalizations reflect totals reported through July 30.



cases—so it does not necessarily mean that large metro areas are experiencing fewer cases than they had earlier in the pandemic.

The geographic profile of hospitalized COVID-19 patients has seen similar changes over time.

The second panel of Chart 1 above shows that by late July, less than half of currently hospitalized COVID-19 patients (44%) were in facilities located in large urban areas. As the virus has taken root in smaller metro areas and in rural communities that had previously seen few cases, hospitalizations in those areas have grown substantially as a share of the state total. For example, on May 1, 11% of hospitalized patients were in facilities located in small metro areas. By late July, hospitals in small metro areas were treating 44% of hospitalized patients statewide. It is worth noting that our estimates likely understate the growing burden outside of the major metro areas, as several hospitals in Nashville and Memphis are also treating patients from the adjacent and rural communities.

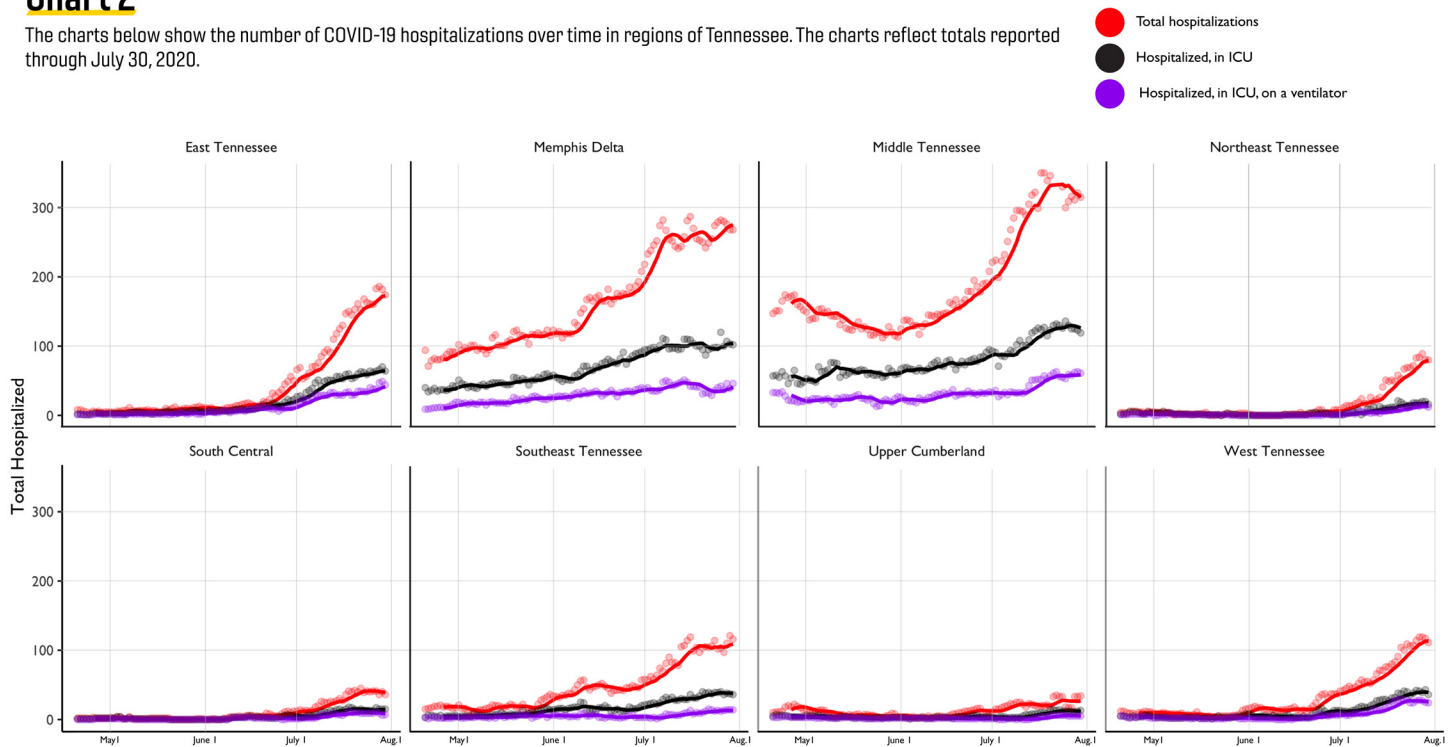
To the degree these changes reflect hospitalizations that have increased rapidly over the last month, these recent trends underscore the potential to stress health care systems in areas with fewer staffing and bed resources. These challenges could then spill over into facilities located in large urban areas, who are likely to see rising numbers of transfers and walk-in cases originating from more rural areas.

As shown in Chart 2, regional breakdowns in the number of hospitalized COVID-19 patients demonstrate additional variation across metro and non-metro areas. Among large metros, hospitalizations in the Nashville region and Memphis stabilized starting in mid-July.

Among smaller metros, hospitalizations in the Chattanooga region have stabilized around 100, but continue to climb in hospitals around Knoxville (East Tennessee region). As of July 29, hospitalizations also remained on an

## Chart 2

The charts below show the number of COVID-19 hospitalizations over time in regions of Tennessee. The charts reflect totals reported through July 30, 2020.



upward trajectory in Northeast Tennessee, around Johnson City, and in West Tennessee, around Jackson. The South Central and Upper Cumberland regions, by comparison, saw growth and then more recent stabilization the number of hospitalized COVID-19 patients.

### Conclusions: What does this mean?

Throughout June and early July, regions across Tennessee were on similar trajectories, with rising caseloads followed by rising hospitalizations. However, since mid-July, the experience of Tennessee communities has begun to diverge. Cases and hospitalizations appear to be stable in large urban areas, while many small metro areas continue to see growth. The impact of this shift remains to be seen.

If smaller metro areas have fewer resources for contact tracing, or if individuals and policymakers in those communities are less likely to adopt mitigation strategies (e.g., mask ordinances and limitations on large group gatherings), there is the potential for the disease to spread further. There is also the potential that as numbers increase in those areas, depleted health care resources may result in transfers of patients back to facilities in metro areas. It is critical to watch these trends and to ensure that communities that are being hardest hit are able to respond quickly and adequately.

Finally, we would note that new cases and hospitalizations are stable, concurrent with increased use of masks in those areas, while areas without mask orders have seen increases. It is also important to note that there are other mitigation strategies in effect or reinstated in these areas that could also be contributing to these trends. While these data do not establish a causal relationship, they are consistent with other research about the efficacy of masks at reducing transmission of COVID-19.

*This report was prepared by John Graves, PhD, associate professor of Health Policy and director of the Center for Health Economic Modeling, Melissa McPheeters, PhD, research professor in the Department of Health Policy and co-director of the Center for Improving the Public's Health Through Informatics, Melinda Buntin, PhD, Mike Curb Professor of Health Policy and Chair, Department of Health Policy. Data analysis and presentation support were provided by Jake Lowary, Leonce Nshuti, and Zilu Zhou; the team received input from Vanderbilt's Health Policy and Public Health Advisory Panel.*