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Early Insights from the University of Minnesota's COVID-19 Hospitalization Tracking Dashboard (4/13, University of Minnesota)

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Abstract

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What is the message? Early daily data from a new publicly-available dashboard at the University of Minnesota Carlson School of Management reports a high variance in COVID-19 hospitalizations across the United States. The data can help public health officials promote the adoption of best practices and resource sharing, including hospital capacity and ventilators.

What is the evidence? The authors have created a publicly-available real-time tracking model.

Link to dashboard:
https://carlsonschool.umn.edu/mili-misrc-covid19-tracking-project

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Pandemics Are Inevitable – A Weak Response Is Not

While the emergence of COVID-19 may not have been preventable, the tragic impact of the virus could have been mitigated with better preparation and response. As the pandemic unfolds, one of the greatest barriers to prospective planning has been credible and consistent data. While case rates have been reported in the U.S. since January 20 – the date of the first confirmed case of 2019-nCoV infection in the country – this does not adequately reflect the spread of the virus because testing capability has been limited. As a result, the only metric available from all 50 states is the number of deaths, at least those that are not attributed to other causes, a moderately accurate but trailing indicator that does not provide an adequate lens to the impact of the crisis on our healthcare infrastructure.

A Data Collection and Reporting Dashboard for Hospital-Based Deaths

In March, the Medical Industry Leadership Institute [1]and the Management Information Systems Research Center [2] at the University of Minnesota Carlson School of Management launched a project to collect daily data from state Departments of Health on COVID-19 hospitalizations. The project team sent serial emails to the communication/media director of each state describing the project and requesting information starting March 26. At that time, only 23 states publicly reported any hospitalization data on their publicly available websites.

Fortunately, we now have a majority of states. As of April 10, 40 states are reporting data on hospitalizations: 23 states are reporting total hospitalizations to date and 21 states report current hospitalizations. Minnesota, Montana, North Dakota, and Oregon report on both measures for COVID-19 hospitalizations.

Since April 6, this data has been shared on a publicly available dashboard. The University of Minnesota COVID-19 Hospitalization Tracking Project (https://carlsonschool.umn.edu/mili-misrc-covid19-tracking-project) displays real-time and historical (since project inception) data for current and total hospitalizations as well as ICU data. All data are adjusted for states' population. In addition, each state's hospital bed capacity is

calculated. The projects' early results, reflecting nine days of data, were published in Health Affairs.

Actionable Insights From the Dashboard

Ongoing data collection expand these insights and, after only 16 days of data collection and tracking, there are new actionable insights from this new comprehensive state by state view. Two key implications involve variance among states and forecasts of hospital resource needs.

- **High variance in hospitalization among states.** The average total hospitalizations per 100K adults is 14.9 (Table 1) among the 23 reporting states. Minnesota's rate (7.6) is significantly lower than the average and remarkably lower than Wisconsin (20.6), a neighboring state. Public health officials can use these data comparisons to identify and potentially adopt best practices from other states. In addition, visibility to the hospitalization data of neighboring states means states can work with each other to share resources – from hospital capacity to ventilators to personal protective equipment to personnel.

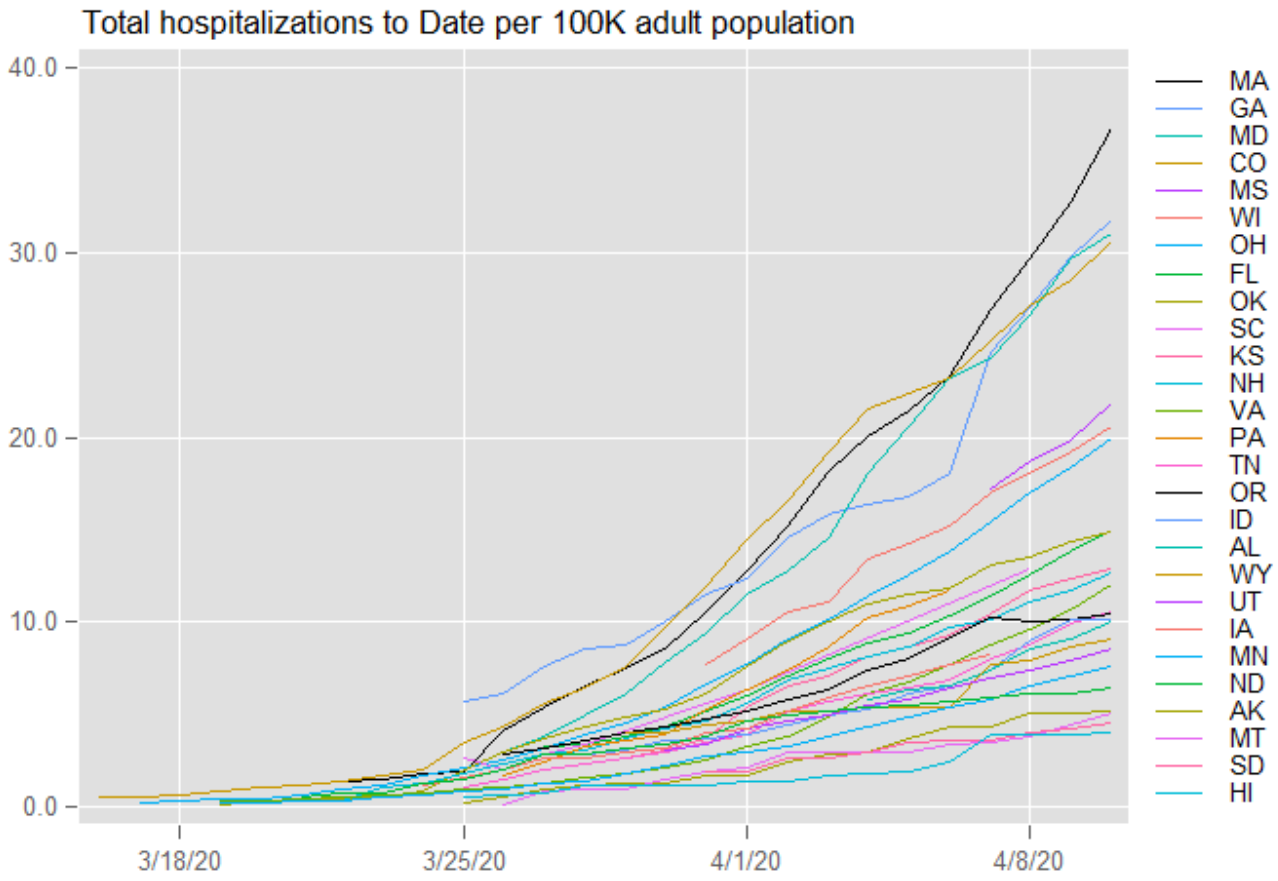
Table 1: Hospitalizations per capita among reporting states, April 10, 2020

State	Total hospitalizations to date per 100K adult population	State	Current hospitalizations per 100K adult population
Hawaii	3.96	North Dakota	2.32
Montana	5.08	Minnesota	3.43
Utah	8.58	Montana	3.59
South Dakota	4.53	Arkansas	3.85
North Dakota	6.43	Oregon	4.35
Alaska	5.22	New Mexico	4.82
Minnesota	7.61	Iowa	5.10
Oregon	10.50	North Carolina	5.43
Virginia	12.02	Vermont	6.54
Tennessee	10.52	Texas	7.47
Idaho	10.16	California	9.81
Massachusetts	36.72	Maine	10.51
New Hampshire	12.62	Missouri	11.02
Alabama	10.03	Washington	11.39
Kansas	12.90	Pennsylvania	21.31
Florida	15.05	Rhode Island	22.25
Ohio	19.97	Delaware	24.52
Wisconsin	20.63	Connecticut	57.14
Oklahoma	14.86	Louisiana	59.57
Mississippi	21.82	New Jersey	112.32
Maryland	31.07	New York	123.99
Georgia	31.79		
Colorado	30.64		
Average	14.90		24.32

- **Hospitalization trends are leading indicators of resource needs.** Trending each

state's hospitalizations per 100K adults over time (Figures 1 and 2) offers a lens into the severity and activity of the virus. As the pandemic's impact in Massachusetts, Georgia, Maryland, and Colorado trails one to two weeks behind New York and New Jersey, state health agencies can perform predictive modeling of their upcoming needs to forecast their hospital bed utilization. At a federal level, this national view can help optimally allocate the addition of hospital resources and capacity across states.

Figure 1: Total hospitalization to date per 100K adult population



Looking Forward

We will continue daily data collection for the foreseeable future. We are also collecting more within-state geography data that will refine modeling and support predictive analyses to help optimize management of hospital resources and capacity. This is particularly important as we anticipate and prepare for a potential second round surge of COVID-19 in the fall.

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References

[1] https://carlsonschool.umn.edu/faculty-research/medical-industry-leadership-institute

[2] http://www.misrc.umn.edu/