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## School of Informatics, Computing and Cyber Systems

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December 1, 2020

TO: Steven Bailey  
Chief, Bureau of Public Health Statistics  
Arizona Department of Health Services

FROM: Members of the COVID-19 Modeling Team at Northern Arizona University

RE: Strong concern regarding county-specific COVID-19 modeling projections for Arizona

Since the start of the COVID-19 epidemic in Arizona, our modeling team has been creating spatially-refined models of virus transmission to provide county-specific projections of COVID-19 cases and hospitalizations, and have been distributing weekly reports on our evolving findings to the leadership at each county's Department of Public Health or equivalent. Our county-specific modeling efforts are complementary to the high-quality, state-wide modeling efforts produced by the ASU Modeling Team.

We are writing this letter to further amplify the strong concern that has been expressed recently by the Modeling Team at the University of Arizona, by emphasizing that our county-specific models are showing similar alarming projections for all Arizona counties. This is not just a question of statewide statistics being skewed by a few counties; all counties in Arizona are currently experiencing exponential (or near-exponential) spread of COVID-19. Our aim is to provide further strong data-driven evidence that increased immediate and sustained public health interventions are needed to curb the spread of this virus and avoid unnecessary hardship and death to Arizona citizens. In particular, action is particularly vital to mitigate threats to some of our most vulnerable communities.

Between early October 2020 and the present time, we estimate that the effective R-naught of the SARS-CoV-2 virus has been sustained at or above 1.0 in the majority of Arizona counties. This means that most counties in Arizona have sustained linear or exponential spread of the virus for almost two months now, leading to a sharply increasing number of infections and, proportionally, in hospitalizations. As pointed out by the UA Team, this has led to an unsustainable strain on our state's hospital system that we anticipate will get worse without immediate intervention. *Even with immediate action, hospitalizations could increase for some weeks, as we saw in the early summer<sup>1</sup>.*

Based on our county-specific analysis and modeling efforts, we would like to add the following points to further refine the concerns outlined in the urgent memo drafted by our colleagues at the University of Arizona:

- It is important to note that hospital capacity, staff resources, and financial resources vary across counties in our state. Similarly, some communities have been disproportionately affected by the economic and health burden of COVID-19 through a combination of case loads

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<sup>1</sup> Trends in COVID-19 Incidence After Implementation of Mitigation Measures — Arizona, January 22–August 7, 2020. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6940e3.htm>

and resource scarcity. What this means is that the current surge of COVID-19 has significant potential to increase the health disparities within our state, and we emphasize the need for local and state-level action to assist the communities most at-risk.

- We are in full agreement with the recommended strategies and public health interventions outlined by the University of Arizona letter dated November 27, 2020. Even in the brief history of COVID-19, clear empirical data show that limitations on large group gatherings, shelter-in-place orders, targeted testing and isolation procedures, and mask mandates can all work together to be effective strategies to limiting the spread of this virus<sup>1</sup>. We specifically point out the clear successes in applying these strategies – supported by strict enforcement – in effectively avoiding spread of COVID-19 on the campuses of all three state universities during the Fall 2020 semester. These smaller scale successes emphasize that local-level actions with strong and consistent enforcement can be successful, even in a dense, high-risk community like a college campus; applying them to Arizona communities state-wide has strong potential to have a significant impact in controlling spread of the virus. We encourage our state leadership to leverage these valuable lessons in strengthening public health interventions and mandates to control the current surge in COVID-19 cases.
- We point out an opportunity for our state to become a leader in “smart” COVID-19 mitigation by taking advantage of *innovations in targeted testing*. Because this virus is transmitted by asymptomatic and pre-symptomatic individuals, many in the modeling and public health communities have advocated for a strategy of deploying rapid testing at the household level. This approach has also been recently supported by the Trump Administration<sup>2</sup>. These rapid tests could be provided to citizens by the State at no-cost, could be used on a daily basis, and financial incentives could encourage people to stay home if they show a positive result. Surveillance testing, including wastewater testing, could also be used to identify local outbreaks where the deployment of rapid testing could be more effectively targeted. If implemented on a massive scale and with strong community adoption, this strategy could curb the *asymptomatic* spread of the virus in both the immediate and long term, allowing us to ease or avoid the financial burdens of large-scale closures of the economy. This could allow the state of Arizona to become a leader in using testing to more finely tailor public health interventions based on specific local needs.

*Disclaimer: our assessment and recommendations reflect our individual professional expert opinions and do not constitute an official statement by Northern Arizona University or any of its sub-units.*

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<sup>2</sup> Trump Announces Plan to Ship 150 Million Rapid Coronavirus Tests.  
<https://www.nytimes.com/2020/09/28/health/trump-coronavirus-testing-rapid.html>