

To City Council Members, Mayors, and City Managers of Champaign and Urbana

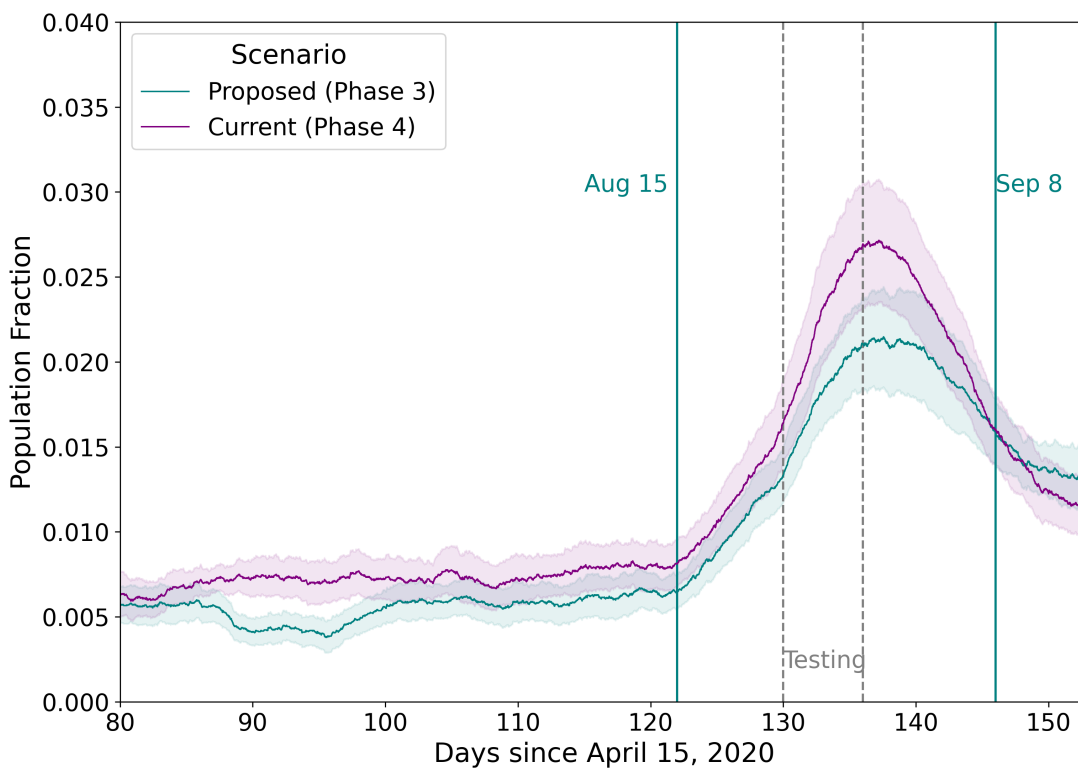
Recommendations to the Cities of Champaign and Urbana with respect to managing Covid-19 as the University of Illinois reopens for Fall 2020

From: Eric Jakobsson, Department of Molecular and Integrative Physiology and NCSA, UIUC  
Santiago Nunez-Corrales, Graduate Program in Informatics, UIUC

Our Covid-19 modeling paper for Champaign-Urbana has been deposited to the repository MedRxiv at

<https://www.medrxiv.org/content/medrxiv/early/2020/07/25/2020.07.22.20159798.full.pdf>

In addition to what has been posted at the preprint repository we have now modeled in more detail the scenario facing the cities in the immediate future, as a large cohort of individuals come to Champaign-Urbana bearing a significantly higher viral load than those who have been here up to now. The results of this modeling lead us to suggest returning to Phase 3 constraints for bars and restaurants for about 3 weeks from August 15 to September 8 until the University testing and isolation has gone through its first cycle. Detailed results and explanation below. Would be glad to discuss individually at 217 390 7024



The above graph contains our best calculation of the effects of moving Champaign-Urbana bars and restaurants between Phase 3 and Phase 4 restrictions. The vertical axis is the fraction of

the total population in C-U actively infected with Covid, which can't be measured directly but is inferred from measured positivity in tests and other factors in the population. Day 117 is August 10, so the curves to the left of Day 117 represent the recent history (Phase 4) and what the history would have been if we had never moved from Phase 3 to Phase 4. It is seen that the difference is minimal. The first vertical line is at Day 122 (August 15), which is a popular move-in date for people returning to campus. Beginning at about August 15, the curves turn distinctly upwards. This is due to the influx into the community of the returning cohort, whom we estimate to be carrying a population-normalized viral load characteristic of Illinois as a whole, which is approximately nine times that in Champaign-Urbana. As the curves turn upwards, they start to diverge, so a significant difference begins to be seen between the effects of Phase 3 and Phase 4. The reason for this is the Phase 3 restrictions reduce contact between the incoming cohort and everybody else. Between Day 130 (August 23, first day of classes, students and staff must be tested to go on campus) and August 30 the rate of rise in infections slows down and begins finally to turn downwards. The slowing and reversal is due to the completion of the first round of comprehensive testing and isolation of positives of University students and staff. By August 30 the testing and isolation regimen is beginning to win the battle against the imported viral load in the returning cohort.

The widest gap between Phase 3 and Phase 4 is on Day 137 (August 30), at which point under the Phase 4 regimen approximately 2.7% of the cities' population is infected while under a reversion to phase 3 just 2.1% is infected. After this date both the Phase 3 and Phase 4 curves decline and move closer together. They have come together by Day 145 (September 8) which implies that at that point return to Phase 4 would be appropriate, so the total duration of return to Phase 3, should the cities decide to do that, would be about three weeks.

The difference between the peak infective states of the population between 2.7% and 2.1%, 0.6%, amounts to about 800 more people who will be infected if Phase 4 is maintained. We can reasonably estimate that 10%, or approximately 80 of those individuals, will require hospitalization. It is estimated one-half-of one per cent of those infected with Covid-19 die. That would amount to 4 deaths to be attributed to a decision to maintain Phase 4 rather than temporarily return to Phase 3