FORWARD DANE

Update on Dane County's progress during the COVID-19 pandemic

JULY 1, 2020

Where We are Today

In May 2020, we released Forward Dane, our plan for the phased reopening of Dane County during the COVID-19 pandemic. In the time since then, we navigated from Safer at Home, to Planning for a Safe Reopening, to Phase 1, to Phase 2. During the week of June 22, Dane County saw a rapid increase in cases. Contact tracing interviews revealed cases often had attended gatherings or visited bars, which led to two orders limiting gatherings and activities at bars and restaurants.

As we outlined in the plan, "While we hope that by following this plan our path to reopening will be linear, we cannot predict the path of this virus. It's possible that we may have to tighten or loosen orders so we can all stay safe and healthy and keep our healthcare and public health systems from becoming overwhelmed. We have created Forward Dane using data and the best evidence available so we can ensure our peaks stay low and we avoid the need for additional orders."

We are at the point where planned phases are no longer useful. Rather than completely move the entire county backwards a phase due to a rapid, sustained increase in cases, we are doing what we have always done: looking to the data. Contact tracing interviews have been critical for not only containing the virus, but also helping us have a better understanding where the true issues lie. In the case of Executive Order #6, for example, it didn't make sense to move the county back to Phase 1 when the issues we were seeing were largely due to gatherings at homes and in bars.

Our Forward Dane goals and framework are unchanged. Our goals are to reduce the number of people who contract COVID-19 and reduce the number of people who die from COVID-19. We still are relying on data to drive decision-making and are monitoring metrics to assess when loosening of policies is warranted.
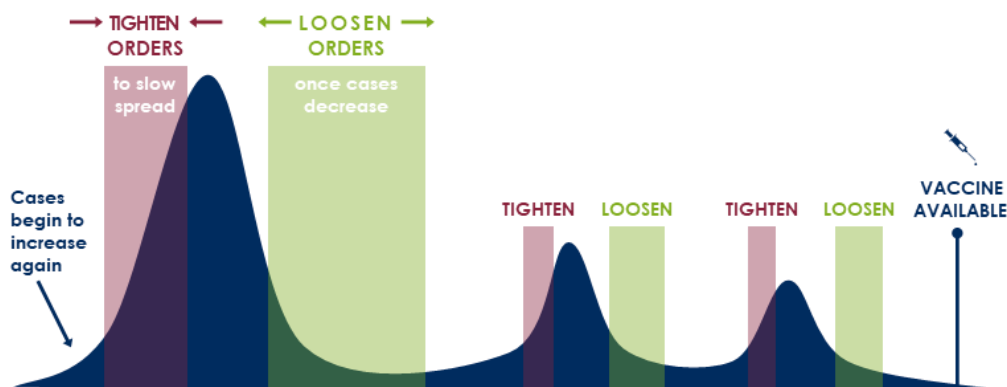
Forward Dane Metrics

We have nine Forward Dane metrics to help us assess our growth and number of cases, the ability of the healthcare system to respond to cases, and our ability to contain infections. The nine metrics fall under three umbrellas:

Epidemiology

From a disease control standpoint, we must have few enough cases of COVID-19 to be swiftly contained. This is an important parameter, and our thresholds for phased reopening are set at levels that align with the progression of our epidemic locally—a lower positivity rate than what is seen at the state level and a low number of cases per 100,000 residents

Healthcare

A sustained, high testing level is a critical metric that ensures our epidemiology criteria are meaningful. Testing is how we detect active infection, which leads to contact tracing and prevention of further disease transmission. Alongside testing to monitor the course of the epidemic, it is vital that healthcare systems are equipped to manage patient care in the context of a surge caused by COVID-19. To establish that hospitals are operating outside of crisis care, one of our metrics measures facility use, staffing, and critical supplies across Dane County hospitals. Given that healthcare workers power healthcare systems, we need to ensure evidence of robust testing of healthcare workers, and sustained low rates of positivity among healthcare workers.

Public Health

The third aspect of disease containment is our ability to identify and isolate individuals with positive diagnoses in order to prevent further spread. Through rapid contact tracing, we can identify and notify contacts who have been exposed. Through education and isolation assistance, we can help keep people who test positive and their contacts separated from others for the duration of the infectious period, and lower the risk of spread in the community. Monitoring community spread—the percentage of cases with an unidentified risk factor—is how we can gain a sense of the scale of undetected disease spread.

Process Measures

In addition to the publicly facing nine metrics, we'll be monitoring process measures when things aren't going well to help us understand where there may be a gap in the system. These process measures look at transmission dynamics (the "R" value of our epidemic), lab result reporting timeliness, outbreak monitoring within priority populations, capacity for supporting isolation/quarantine, and contact attempts of both cases and contacts.

Category	Measure	Threshold Metrics
Epidemiology	Cases	Below a threshold of 5% for positive tests as a percent of total tests averaged across most recent 14 day period	**Green:** Below 5% positivity **Yellow:** 5-10% positivity **Red:** Above 10% positivity
	Cases	Below a low incidence threshold of 0.71 new cases per 100,000 people per day (this is below 4 cases per day for Dane County) averaged over most recent 14 day period	**Green:** Below 4 cases per day **Yellow:** 4-20 cases per day **Red:** Greater than 20 cases per day
Healthcare	Testing	Testing supplies and staff facilitate adequate testing for disease control and surveillance with a goal of 154 tests per 100,000 (this is over 800 tests per day for Dane County) in most recent 14 day period	**Green:** Greater than 800 tests per day **Yellow:** 400-800 tests per day **Red:** Below 400 tests per day
	Hospital capacity	Robust testing in place for health care workers	**Green:** 95% of hospitals have arranged for all COVID-19 symptomatic clinical staff treating patients at the hospital in the past week **Red:** Less than 95% of hospitals have arranged for all COVID-symptomatic clinical staff treating patients at the hospital in the past week
	Hospital capacity	Treat all patients without crisis care	**Green:** 95% of hospitals answer "no" to all 3 questions **Facility use status:** the facility is damaged/unsafe or non-patient care areas are being used by the facility for patient care **Staffing status:** trained staff are unavailable or unable to adequately care for the volume of patients even with extension techniques **Critical supply status:** critical supplies are lacking, resulting in reallocation of life-sustaining resources and/or other extreme operating conditions **Red:** Yes to one or more questions
	Hospital capacity	Stable or decreasing numbers of infected health care workers	**Green:** No significant increase in weekly healthcare worker infections for most recent 14 days **Yellow:** Significant increase in healthcare worker cases due to a known cluster in a single facility for most recent 14 days **Red:** Significant increase in new weekly healthcare worker cases for most recent 4 weeks
Public Health	Lab reporting timeliness and contact tracing	All positive cases can be reported and contacted quickly to facilitate rapid isolation and quarantine for disease control	**Green:** More than 85% of all new cases are contacted within 48 hours of their test collection **Yellow:** 70-85% of all new cases are contacted within 48 hours of their test collection **Red:** Fewer than 70% of all new cases are contacted within 48 hours of their test collection
	Community spread	Proportion of contacted COVID-19 cases who don't know where they could have gotten COVID-19 in most recent 14 day period	**Green:** Fewer than 20% of cases don't know where they could have gotten COVID-19 **Yellow:** 20-30% cases don't know where they could have gotten COVID-19 **Red:** More than 30% cases don't know where they could have gotten COVID-19

Surveillance	Stable or decrease of COVID-like syndromic cases reported within most recent 14 day period	**Green:** No significant increase in COVID-like syndromic cases for most recent 14 days
		Red: Significant increase in COVID-like syndromic cases for most recent 14 days

Criteria for Tightening and Loosening Orders

When Forward Dane metrics turn red—that is, the data fall into levels of concern—there is rationale to pause in a phase and not move forward. However, the metrics do not specify when a "Rebound" is needed—that is, when the data signify a need to urgently adjust course by returning to a previous phase or iteration of a previous phase. There is no specific state or federal guidance about when returning to prior phases is warranted.

For this rebound, we will rely on a metric that combines a measure of number of cases and trends. A sustained, large number of cases paired with an upward trajectory will prompt Rebound action. This could mean fully returning to a previous phase, or returning to elements of a previous phase. When data point to a specific driver (such as a particular sector or activity) of the increased case count and upward trajectory, a more focused Rebound may occur. When data cannot identify main contributing factors to an increased case count and upward trajectory, a more generalized Rebound may occur.

COVID-19 Activity level

Burden status	Trajectory status		
	Shrinking	**No significant change**	**Growing**
Low	Consider forward phase move if criteria met	Consider forward phase move if criteria met	Consider forward phase move if criteria met
Moderate	Consider forward phase move if criteria met	Consider forward phase move if criteria met	Rebound
Moderately high	Rebound	Rebound	Rebound
High	Rebound	Rebound	Rebound

The composite indicator comprised of burden and trajectory is calculated by DHS, updated weekly on Wednesdays, and presented on their website. DHS looks at the total number of cases per 100,000 in the last two weeks and categorizes it as low, moderate, moderately high, and high. The thresholds for case levels are based on the same source as the Forward Dane metrics for cases (CDC). A moderately high burden translates to between about 20 and 40 cases per day in Dane County. A high burden translates to over 40 cases per day in Dane County. Trajectory is defined as an increase in 10% in the most recent 7-day period that is statistically significantly different in the prior 7-day period.

A moderately high or high burden alone or paired with a growing epidemic (red squares, above) will trigger a Rebound analysis. Our Data Team will conduct a rapid analysis to identify significant factors contributing to the increase in cases. When the increase can be attributed to specific sectors (e.g., bars), targeted interventions with those sectors will be considered. There may be circumstances where

broader restrictions would be considered (e.g., the increase cannot be attributed to specific sectors). Once mitigation measures are determined, they will remain in place for a minimum of four weeks.

The Forward Dane metrics will continue to be monitored on a weekly basis, and the DHS composite indicator will be posted on the DHS website weekly. If Dane County has moved out of the red categories (table above) and meets Forward Dane metric criteria [no red metrics; at least half metrics are green; region cannot have a red metric], a gradual re-opening of sectors *not* impacted under the Rebound orders per Forward Dane can resume. Sectors impacted by Rebound orders shall re-enter at a Phase 1 level or an appropriately data-driven, adapted level and remain at this level for four weeks.

Currently, DHS's method for calculating burden:

The confirmed case burden of region r at time t, B_t^r, is based on the CDC definition: the number of confirmed cases per 100,000 people over the past two weeks. Burden is defined as

$$B_w^r = 100{,}000 \times \frac{WC_{w-1}^r + WC_w^r}{Pop^r}$$

where WC_w^r is the total number of confirmed cases during week w. This definition has some disadvantages. First, zero counts are mapped to $-\infty$ by log-transformation. Second, it does not include inference. We propose estimate Poisson rate parameters, θ, from counts, C, using a Bayesian estimator with a non-informative prior,

$$\theta_c \sim (rgamma(\,N, C + \alpha, 1 + \beta))$$

where $\alpha = 0.5$, $\beta = 10^{-4}$ (based on the *bayes.poisson.test* procedure from the R *BayesianFirstAid* package, and $N = 10^7$. It seems simple and transparent to use

$$\bar{\theta}_c = C + \alpha$$

$$B_w^r \sim \frac{100{,}000}{Pop^r} \bar{\theta}_{wc_{w-1}^r + wc_w^r}$$

DHS method for calculating trajectory:

The trajectory of region r at time t, T_t^r, is defined by

$$T_w^r = 100 \times \left(\frac{WC_w^r + 1}{WC_{w-1}^r + 1} - 1 \right)$$

Significance is evaluated using a two-sided exact test of the equality of WC_{w-1}^r and WC_w^r, implemented using the *poisson.test* procedure from the R *stats* package. We note that the stated significance thresholds apply to the two-sided test and that classification is based on both statistical significance and effect size.

We propose to use

$$T_w^r = 100 \times \left(\frac{\bar{\theta}_{wc_w^r}}{\bar{\theta}_{wc_{w-1}^r}} - 1 \right)$$