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Public Health
MADISON & DANE COUNTY
Healthy people. Healthy places.

DATE: May 26, 2020

TO: City of Madison Common Council Members: Patrick Heck, Marsha Rummel, Max
 Prestigiacomo, Syed Abbas, Tag Evers, Grant Foster, Samba Baldeh, and Rebecca Kemble
 and Dane County Board of Supervisors: Heidi Wegleitner, Elena Haasl, Yogesh Chawla and
 Michele Ritt.

FROM: Janel Heinrich, MPH, MA,
 Director, Public Health Madison & Dane County

SUBJECT: *Forward Dane*

Dear All,

I appreciate the shared desire to protect the health and well-being of all Dane County residents. Until we have a vaccine, treatment, or more research around immunity to COVID-19 we have limited tools to fight this pandemic.

Forward Dane is intended to provide a framework to guide our community forward in a way that mitigates risk of transmission of COVID in the places that we live, learn, work, and play. Public health orders are one tool available to minimize risk of transmission. As you outline in your letter, the majority of the work of Public Health Madison & Dane County is focused on the other tools we have available to us to stop the chains of transmission via testing, isolation of cases, contact tracing, and quarantine of contacts. Before I speak to these activities, I'd like to focus on Forward Dane.

The goals of Forward Dane are multifold:
- to use data and science to inform our decision making to support our community's ability to slowly and safely return to recreation and economic activity
- to keep Dane County moving forward through the phases of the plan, realizing this may take time as we continue to measure locally tailored metrics related to our ability to contain and mitigate the spread of disease
- to use our public health knowledge to protect Dane County residents and workers by putting requirements into orders that assure appropriate preventive measures and risk mitigation strategies are in place for everyone when they live, learn, work, and play
- to be as transparent as we can be with our community members and business owners as we navigate an unprecedented pandemic of a novel disease

The metrics we have identified in Forward Dane are the result of a deep assessment of the landscape of existing plans—local, regional, state, national, governmental, nongovernmental. The metrics for moving through phases are locally tailored, and built using both national guidance as well as our historic data. As a smaller jurisdiction with a low-incidence epidemic, the state-level metrics are not as sensitive as we need to detect meaningful change. Hence our nine metrics outlined in Forward Dane and described in

the attached spreadsheet (Appendix A). We are in alignment with most other plans—a steady, stepwise re-opening that uses metrics based in epidemiology and health system capacity. We appreciate and value the COVID-local metrics cited in your letter. Unfortunately, these metrics were released days after our Forward Dane plan went public. The Forward Dane metrics largely align with the suggested COVID-local metrics.

In addition to the Forward Dane metrics, we are utilizing process measures (Appendix A) to understand the reasons behind the values that show up in the Forward Dane metrics. We have shared the rationale behind the Forward Dane metrics in a data snapshot available here. These and all metrics have detailed sourcing, threshold justification, and codebook in a spreadsheet that we are happy to share upon request.

Our data team has years of training and experience working at state and national organizations and world-class universities. They also regularly consult with partners at the University of Wisconsin and Department of Health Services who are experts in this field.

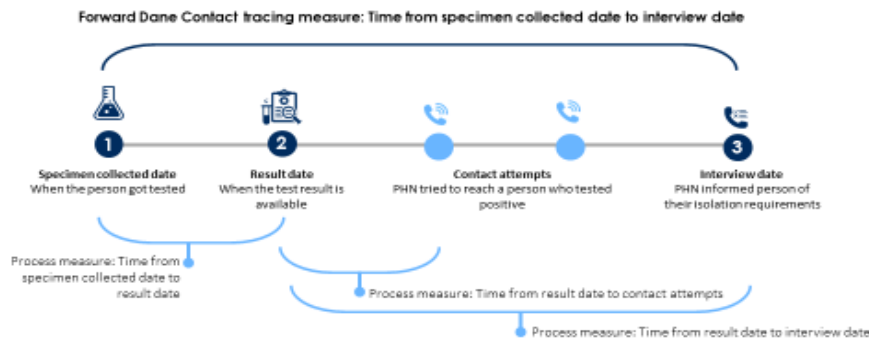In response to the questions raised in your letter:

Infection Rate:
With a median number of new cases per day at 7, (or 10 for the latter half of May, when community-based testing started ramping up) Dane County has seen low numbers of new cases over the course of the epidemic. Consequently, demonstrating a statistically significant and meaningful decline would be challenging. As a result, we have adopted a metric for a low incidence threshold that is *below* 1 case per 100,000. We use 0.71 cases per 100,000 based on CDC's low incidence plateau threshold of less than 10 cases per 100,000 over 14 days. The Forward Dane metrics are more tailored to our community than the COVID-local plan metrics referenced in the letter.

Lab reporting timeliness
We certainly agree that rapid lab reporting is vital for contact tracing to be effective. This is why we've linked lab timeliness and contact tracing together in one bound metric. A majority of the tests are currently being returned within 24 hours, with 70% of tests being reported within 24 hours since the beginning of the epidemic. Our Forward Dane metric is "greater than 85% of all new cases are provided isolation guidance by public health within 48 hours of test collection." This means we start the contact tracing clock the moment a specimen is collected. Not when PHMDC learns about it, but the moment the specimen is collected. This requires both rapid lab processing and rapid contact tracing. This is another important metric of Forward Dane that the COVID-Local plan does not account for.

Metric: Test to Interview Timeline

Forward Dane Contact tracing measure: Time from specimen collected date to interview date

Specimen collected date
When the person got tested

Result date
When the test result is available

Contact attempts
PHN tried to reach a person who tested positive

Interview date
PHN informed person of their isolation requirements

Process measure: Time from specimen collected date to result date

Process measure: Time from result date to contact attempts

Process measure: Time from result date to interview date

Contact Tracing:

Our capacity for contact tracing is, and has been, sufficient during our COVID response.   The recommendation for 30 contact tracers per 100,000 (~160 contact tracers for a county the size of Dane) does not fit our local conditions at this time. We have internal metrics (including a nationally-developed contact tracing calculator) to help us determine if contact tracing capacity is sufficient and are monitoring this regularly to assure we are scaling our contact tracing capacity accordingly. Our test metric to conduct 800 tests per day (152/100,000 population) means that at a 3% positivity rate, we would expect to see 24 cases per day. Conservatively, this would require 22 contact tracers (24 cases would generate approximately 50 contacts, based on our actual rate of 2.1 contacts/case) using a rate of 2 cases per case tracer per day and 5 contacts per contact tracer per day). At a positivity rate of 5%, we would expect to see 40 cases per day. This could require 36 contact tracers. Our positivity rate has been consistently below 3%--hovering between 0.9% and 1.2% on a biweekly basis. We currently have a contact tracing team that exceeds that required to support a 5% positivity rate. Should we require additional contact tracing staff, we are prepared to activate additional cohorts of contact tracers.

At-risk populations

We agree that long-term care facilities (LCTF) represent a priority population. 28% of cases in the last 28 days were in long-term care or congregate living facilities (including both residents and workers). This is why PHMDC is working with the state health department to facilitate more testing. Our contact tracing team has nurses who specifically follow up with long-term care facilities. Additionally, PHMDC is currently recruiting for two Infection Control Prevention Specialist who would provide additional technical assistance to long-term care facilities. A Forward Dane process measure includes looking at outbreaks in LTCFs. In fact, many of our process measures (these are measures that inform where a 'breakdown' has occurred when a Forward Dane metric edges closer to red) are similar to those indicated in your letter. (see process measures in Appendix A).

Additionally, we are grateful that the City of Madison and Dane County have allocated resources to create additional housing solutions for those who are housing insecure as well as a Medical Respite

Center (MRC) to support quarantine and isolation for those who are unable to do so at home. This is in addition to the creation of a $250K fund built into the PHMDC budget to support individuals with isolation and quarantine resources such as temporary shelter, food, cleaning supplies, or assistance with bills while unable to work.

Inpatient and ICU capacity in the region
The data source Milwaukee uses to report inpatient and ICU capacity has been an identified challenge. We have been communicating regularly with our major health system partners in Dane County to understand capacity. We recognize that Statewide, health systems have different definitions of these variables. There is effort to achieve consistency in definition but without that, the variables can be misleading and not meaningful.

The variables with consistent definitions—COVID ICU patients and COVID-related inpatients—are presented daily on our dashboard. For Forward Dane metrics, we utilize the same metric as the state—hospitals reporting whether they are able to treat patients without crisis case, which takes several factors into account beyond ICU capacity, including adequate staffing to care for patients, critical supplies to care for patients, and ability to care for patients without utilizing non-patient care areas.

How to determine if we need to retighten?

The combination of the dashboard metrics and process metrics that would indicate that we are unable to care for, contact within a timely fashion, and quarantine or isolate individuals to stop the spread of disease are of critical importance to future decision making. Depending on the future trajectory of this virus, if the metrics start to turn red, we are prepared to reconsider whether in the best interest of public health we would need to potentially move to a more restrictive phase to slow the spread of this disease.

As you are also well aware, this has been an extremely challenging time for both state and local public health. With the strike-down of Safer at Home, the responsibility for setting re-opening plans fell to the local level. We have been working diligently to rapidly assess the landscape of existing plans—local, regional, state, national, governmental, nongovernmental—and worked to develop one that was scientifically sound but also rational. We are in alignment with most other plans—a steady, stepwise re-opening that uses metrics based in epidemiology and health system capacity. The metrics for moving through phases are locally tailored and built using both national guidance as well as our historic data.

Thank you for your ongoing support and commitment to using data to drive decisions about how to re-open in ways that keep our community safe and healthy,

Regards,

Janel Heinrich, MPH, MA
Director, Public Health Madison & Dane County

CC: Madison Mayor Satya Rhodes Conway
County Executive Joe Parisi
Dane County Board of Supervisors
City of Madison Common Council
Board of Health for Madison & Dane County

Category	Measure Category	Measure	Levels	Justification for inclusion in plan	Justification for threshold	Source of Metric	Calculation	Variables used	R Code	SAS Code	Badger Bounce Back variable?
		NOTE: the date range for all calculations for "14 days" are for 16 days prior to today's date through three days prior to today's date (e.g., if today's date is 5/13, the date range for calculations is 4/27-5/10)									
Epidemiology	Cases	1. Below a threshold of 5% for positive tests as a percent of total tests averaged across most recent 14 days period	Green: Below 5% positivity Yellow: 5-10% positivity Red: Above 10% positivity	If a high percentage of tests come back positive, it's clear there's not enough testing to capture all of the infected people in the community - testing is likely only being completed for the most severe cases or high-risk individuals. A low rate of positivity in testing data can be seen as a sign that there is sufficient testing capacity for the size of the outbreak and we are testing enough of our population to make informed decisions about reopening.	5% benchmark is based on levels seen in Dane County throughout the epidemic. 10% benchmark is based on recommendations from the World Health Organization. https://coronavirus.jhu.edu/testing/testing-positivity	Confirmed daily case counts and daily total number of tests from WEDSS	Sum of people who had their first positive test by day for the past 14 days, divided by the total number of tests conducted by day for the past 14 days, multiplied by 100 to get a percent positive for each day. If someone has more than one positive test, only their first positive test is counted in the numerator, but all tests are counted in the denominator. The denominator is total tests rather than total people tested because percent positivity is also an indicator of testing capacity. We want people, especially those in high risk groups, to be tested more than once, and to include all those tests in our calculations to gauge the spread of COVID and to know whether enough testing is occurring.	Resolution_Status, DILR_resultvalue_001-DILR_resultvalue_026, DILR_organismdescription_001-DILR_organismdescription_026, DILR_resultdate_001-DILR_resultdate_026, DILR_speccollecteddate_001-DILR_speccollecteddate_026	R Code	SAS Code	Yes, but a threshold level used instead of significant downward trend.
Epidemiology	Cases	2. 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 a 14 days period	Green: Below 4 cases per day Yellow: 4-20 cases per day Red: Greater than 20 cases per day	Decreasing cases, alongside a sustained low level of cases, gets us closer to an effective reproduction value of less than 1--that is, an infection is not able to spread through a population effectively. A low rate of new cases allows for public health capacity (contact tracing) and healthcare capacity (hospital resources) to not get overwhelmed.	0.71 new cases per 100,000 has been cited in CDC's "low incidence threshold" (<10 cases per 100,000 per day over 14 days). This translates to less than four (3.75) new cases per day over 14 days for the Dane County population. https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/CDC-Activities-Initiatives-for-COVID-19-Response.pdf https://www.americanprogress.org/issues/healthcare/news/2020/05/04/484373/evidence-based-thresholds-states-must-meet-control-coronavirus-spread-safely-reopen-economies/. A 'medium incidence' is 10-50 per 100,000 per day, or approximately 4-20 at the Dane County level. At a level of 20 cases per day, Dane County's contact tracing capacitywould not be overwhelmed (see contact tracing capacity document, which uses both a national contact tracing calculator as well as capacity estimates from PHMDC's contact tracering team).	Confirmed daily case counts from WEDSS	The sum of confirmed cases in the past 14 days is divided by 14 for a daily average, then divided by the county/region's population. The resulting rate is multiplied by 100,000 to get an average daily rate for the past 14 days per 100,000.	Resolution_Status	R Code		No
Healthcare	Testing (community and vulnerable populations)	3. Testing supplies and staff facilitate adequate testing for disease control and surveillance (goal of 152/100,000 in most recent 14-day period)	Quantitative metrics Green: Greater than 800 tests per day Yellow: 400-800 tests per day Red: Less than 400 tests per day	Widespread testing improves our ability to identify as many cases as possible, minimizing the spread of COVID-19. Comprehensive testing is critical in congregate setting such as long term care facilites and essential businesses upon identification of a positive case, as rapid spread of infection is likely without rapid identification and isolation of individuals within those facilities. Adequate testing is necessary to interpret doubling time and percent positivity appropriately, as we cannot identify cases without robust testing in place.	There have been varied estimates for what a minimal level of testing may require, ranging from 750,000 tests nationally/week (which would correlate to 32 tests/100,000 population/day) to Harvard's suggested 152 tests/100,000 people/day (https://globalepidemics.org/2020/04/18/why-we-need-500000-tests-per-day-to-open-the-economy-and-stay-open/) to Wisconsin state's target of 85,000 tests/week (which would correlate to 209 tests/100,000 population/day--meaning 1,128 for Dane County). Recently, state-level estimates from Harvard Global Health Institute suggests 68 tests/100,000 population/day are needed for Wisconsin, which correlates to a 372 test/day for Dane. https://www.npr.org/sections/health-shots/2020/05/07/851610771/u-s-coronavirus-testing-still-falls-short-hows-your-state-doing. We advise aiming for a higher testing level, since the case metrics are dependent on sufficient testing levels. If testing numbers decrease, process measures should be used to understand if the reason is due to lessened capacity or demand.	Daily total number of tests from WEDSS	Sum of all DILR_resultdate_001-DILR_resultdate_026 where the date is within the past 14 days and resolution status is Confirmed or Not A Case. If test result date is missing, use specimen collected date; if that is missing, use lab report date; if that is missing, use date created.	Resolution_Status, DILR_resultvalue_001-DILR_resultvalue_026, DILR_speccollecteddate_001-DILR_speccollecteddate_026, date_of_lab_report, date_created	R Code	SAS Code	No
Healthcare	Testing (healthcare workers)	4. 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 Yellow: Significant increase in healthcare worker cases due to a known cluster in a single facility for most recent 14 days Red: <95% of hospitals have arranged for all COVID-symptomatic clinical staff treating	Health care workers, including non-medical staff who work in patient care settings, are at higher risk for exposure to COVID due to the nature of the essential service they provide to the community. Testing of health care workers is critical to protecting this workforce and ensure their capacity to care for patients seeking medical care.	DHS set threshold	EMResource	Hospitals answering a yes/no question on a weekly basis in EMResource		N/A	Yes
Healthcare	Hospital capacity (crisis care)	5. Treat all cases without crisis care	Green: 95% of hospitals answer no to all 3 of the following: -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	Keeping the healthcare system stable is essential to ensuring care for COVID and non-COVID patients.	DHS set threshold	EMResource	Hospitals answering a yes/no question on a daily basis in EMResource		N/A	Yes
Healthcare	Hospital capacity (healthcare workers)	6. Stable or decreasing numbers of infected health care workers	Green: No significant increase in weekly health care 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 14 days	Health care workers, including non-medical staff who work in patient care settings, are at higher risk for exposure to COVID and for spreading COVID to vulnerable community members due to the nature of the essential service they provide to the community. Ensuring that infections among health care workers are not increasing is important to ensure that the health care workforce is not depleted and is not unknowingly passing on the virus to other individuals in the health care setting.	Trend included in Badger Bounce Back. Dane Co has had a small number of infected health care workers and does not anticipate the ability to see a significant downward trend over time, which is the justification for a non-significant trend. A threshold was not selected due to a lack of an evidence base for determining a threshold. The yellow level accounts for contained clusters within a facility (such as a long term care facility) that impact the calaculation, but are less concerning at a population level. A significant increase in healthcare workers across facilities would better indicate an underlying systems problem.	Number of health care workers who had their first positive test in the past four weeks, summed by week	Linear regression of cases over past four weeks (each data point = number of new cases in one week); significant increase at p<0.05 level Use date of first positive test to assign dates to cases	IsAHealthcareWorker, OccupationLinked, and variables used to identify positive result date for percent positive calculation		SAS Code (not complete)	Yes, but does not need to be a significant downward trend.

Category	Measure	Measure	Levels	Justification for inclusion in plan	Justification for threshold	Source of Metric	Calculation	Variables used	R Code	SAS Code	Badger Bounce Back variable?
Public Health	Laboratory timeliness and contact tracing	7. All positive cases be contacted quickly to facilitate rapid isolation and quarantine for disease control	Green: >85% of all new cases are provided isolation guidance by public health within 48 hours of test collection Yellow: 70-85% of all new cases are provided isolation guidance by public health within 48 hours of test collection Red: <70% of all new cases are provided isolation guidance by public health within 48 hours of test collection	In order to contain the spread of the virus it is imperative to quickly identify who has the virus and contact them to ensure they are isolated from others, and to identify people they had contact with while they were infectious so those people can also be notified and isolated.	It is critical to quickly identify and isolate cases AND identify contacts, which is dependent on talking with cases. We want to be able to contact nearly all cases within 24 hours of public health receiving their lab results, and want lab results to be reported within 24 hours of when the test specimen was collected, but know that 100% is not feasible. A recent report on HIV contact tracing indicated over 20% of cases are not able to be interviewed (https://www.cdc.gov/mmwr/volumes/68/wr/mm6804a2.htm). The yellow threshold was selected because we would beconcerned about our capacity to adequately contain the spread of COVID if fewer than 70% of cases are contacted in a timely fashion.	Time between date of specimen collected (associated with the first positive test result) and date of first meaningful contact with the case	Calculate the number of days between the date of specimen collected (associated with the first positive test result) for all new cases in the past 14 days and the first meaningful contact of a case, which is either the date of interview or the first date of attempted contact where the "Spoke to client (or designee)" box is checked.	DILR_speccollecteddate_001-DILR_speccollecteddate_026, InterviewDate1, date_001-date_016, spoke_001-spoke_016; variables used to identify positive result date for percent positive calculation		SAS Code	No
Public Health	Community spread	8. Proportion of new COVID-19 cases with no known route of disease transmission in the most recent 14 day period	Green: <20% of cases have no known route of disease transmission Yellow: 20-30% of cases have no known route of disease transmission Red: >30% of cases have no known route of disease transmission	A high percent of cases with no known route of disease transmission means there is likely a large number of individuals unknowingly spreading the virus in the community, which makes isolation and contact tracing much more difficult.	We based this threshold off of historical Dane County data early in the epidemic; before and during Safer at Home.	WEDSS Risk Tab: asks whether the client is a contact of a known COVID case or if they had other risk factors such as travel or health care contact	Identify percent of cases who tested positive in the past 14 days that had no known risk factor/case contact. Cases with NO boxes checked/no interview completed should be excluded from both the numerator and the denominator. Jail cases are not included in the numerator.	"Infection most likely attributed to" variables from the Risk tab		SAS Code	No
Public Health	Surveillance (Covid-like symptoms) *In an environment of robust testing, a yellow/red here should not be viewed as a barrier to re-opening.*	9. Stable or decrease of COVID-like syndromic cases reported within a 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	Included in state level Badger Bounce Back.	Trend included in Badger Bounce Back. Dane Co and the Southern Region has highly volatile data for this metric and does not anticipate the ability to see a significant downward trend over 14 days, which is the justification for a non-significant trend.	ESSENCE	Linear regression of cases over most recent 14 days; significant increase at p<0.05 level. Linear regression is a way to look for trends across time		R Code		Yes

Process measures

Category	Measure	Measure	Levels	Justification for inclusion in plan	Justification for threshold	Source of Metric	Calculation	Variables used	R Code	SAS Code	Badger Bounce Back variable?	
Epidemiology	Transmission dynamics	Reproductive Number "R" is below 1 (indicating each person with COVID is infecting fewer than on other person on average)	Green: R<1 Yellow: ≤ 1 R <2 Red: R >2	R is the average number of secondary cases caused by an infected individual. Looking at R can help us quantify temporal changes in the transmission intensity of the epidemic.		https://doi.org/10.1093/aje/kwt133	Utilizing tool from journal article, "A new framework and software to estimate time-varying reproduction numbers during epidemics"			No		state: https://rt.live/
Healthcare	Testing (timeliness)	Laboratory results of anyone tested for COVID-19 are reported to public health within 24 hours of when the test was collected	Green: at least 95% of tests are reported to public health within 24 hours Yellow: 85-94% of tests are reported to public health within 24 hours Red: Less than 85% of tests are reported to public health within 24 hours	Timeliness of receiving positive lab results is critical in preventing spread of COVID-19 so that cases and contacts can be quickly identified and isolated as appropriate.		WEDSS, date of specimen collection and date of result	Should calculate by test (not by person). Take the difference between the date of specimen collected and the date of result. If date of result is missing, use date of lab report. If date of lab report is missing, use date created. If both date of specimen collected and date of result missing, drop this observation (from numerator and denom)	Resolution_Status, DILR_resultvalue_001-DILR_resultvalue_026, DILR_speccollecteddate_001-DILR_speccollecteddate_026, date_of_lab_report, date_created	R Code		No	
Public Health	Outbreak monitoring (priority populations)	Outbreak monitoring among CDC priority populations, with a focus on LTCFs	Green: No current outbreaks in LTCFs Yellow: One or more cases at one or more LTCFs Red: Significant increase in cases among LTCF residents and/or workers	LTCFs are a source of outbreaks, and this is a way to see if an increase in cases is tied to LTCF outbreaks. Also, this is a vulnerable population and we'd want to know about outbreaks.		WEDSS		Outbreak_id	R Code		No	
Public Health	Contact tracing (process measure)	All positive cases and their contacts be contacted quickly to facilitate rapid isolation and quarantine for disease control	Green: All contacts have at least one contact attempt within 24 hours of the first meaningful contact of the associated case Yellow: One or more contacts were initiated within 24-48 hours of the first meaningful contact of the associated case Red: One or more contacts weren't initiated within 48 hours of the first meaningful contact of the associated case	In order to contain the spread of the virus it is imperative to quickly identify and the contacts a case had while they were infectious so those people can also be notified and isolated.							No	
Public Health	Isolation	Capacity for isolating/quarantining individuals where appropriate	Green: Ability to offer gift cards for financial support, food assistance; ability to house people in alternate locations if needed Red: Unable to offer gift cards for financial support, food assistance; limited ability to house people in alternate locations if needed	Isolation is an essential component of limiting disease spread	Qualitative metric	Public Health Liaison Team; communication with community partners, assessment of city/county-level supports available					No	
Public Health	Surveillance (influenza-like-illness symptoms) *Pause during non-flu season*	Downward trajectory of influenza-like-illness syndromic cases reported within a 14 days period and below a threshold of TBD	Green: No significant increase in ILI syndromic cases for most recent 14 days Red: significant increase in ILI syndromic cases for most recent 14 days	Included in state level Badger Bounce Back.		ESSENCE	Linear regression of cases over most recent 14 days; significant decrease at p<0.05 level		R Code		No	