

March 31, 2020

Re: Implementation Plan to Accelerate a dense network of Real Time Temperature Monitoring in the City of St. Augustine to Aid in the COVID-19 Monitoring and Response

Tracy Upchurch, Mayor, City of St. Augustine
Leanna Freeman, Vice Mayor, City of St. Augustine
Nancy Sikes-Kline, Commissioner, City of St. Augustine
John Valdes, Commissioner, City of St. Augustine
Roxanne Horvath, Commissioner, City of St. Augustine

EXECUTIVE SUMMARY

The City of St. Augustine, in collaboration with Kinsa, Inc., is developing a pilot project to provide real-time temperature data by distributing an additional 600 thermometers to households in the city. This will enable public health officials to monitor, predict, and respond to aggregated changes in fever data with the presence of the COVID-19 pandemic in the city. The project is intended to be initiated by April 22.

Kinsa has created an internet-connected thermometer that allows it to anonymously collect and aggregate fever data. Kinsa has distributed over 1 million thermometers in homes across America today. With these real-time sensors, Kinsa has accurately predicted flu epidemics weeks in advance of the CDC's own surveillance tool. Just two weeks ago, Kinsa's data indicated an unusual rise in fevers in South Florida, even though it was not known to be a Covid-19 epicenter. Within days, testing showed that South Florida has become an epicenter.

The pilot project plan envisions the distribution of 600 thermometers to voluntary households that would maximize surveillance benefit. The project will prioritize households of first responders most likely in contact with the virus, large member households, and family households in underserved communities which might delay seeking care and treatment.

The data collected and analyzed will allow public health and government officials to identify temperature spikes and deploy testing, quarantine, and other health measures where most needed. The data will also facilitate target messaging to affected neighborhoods and the evaluation of the efficacy of orders aimed at controlling and combating the pandemic.

This project's sentinel monitoring network will not only provide immediate benefits, but will prepare the community for any future recurrence of this virus, which some health officials have predicted for later this year.

John Regan, P.E.
City Manager,
City of St. Augustine

Inder Singh
CEO & Founder, Kinsa
Former Executive Vice President,
Clinton Health Access Initiative

Nirav R. Shah, MD, MPH
Senior Scholar, Stanford University
Former Commissioner, NYS Dept of
Health

PLAN OVERVIEW

Dear Mayor and commissioners:

The authorship of this plan is the collaborative effort between myself and the individuals listed below:

Inder Singh

CEO & Founder, Kinsa Inc.

Former Executive Vice President, Clinton Health Access Initiative

Dr. Nirav Shah

Senior Scholar, Stanford University

Former Commissioner, NY State Department of Health

Additional background articles, Kinsa links and biography links are provided in the appendix. I would also like to thank Commissioner Nancy Sikes-Kline whose perseverance brought us together.

PROBLEM

With a shortage of tests and no early warning systems for where outbreaks are occurring in real time, it's difficult for public health officials to know how to respond to and triage cases of COVID-19. The current predictive tools have a long lag time in response and with the scarcity of COVID-19 test results we are unable to make predictive public health policy decisions. The purpose of predictive analytical methods is to identify trends so that there can be a rapid intervention of testing, isolation and containment. This is the basic principle of public health policy that has successfully reduced diseases throughout the world. A clear example of recent success is Vo, Italy, where the entire town's population was tested and rapid intervention was enacted, thus arresting COVID-19 spread.

PROJECT GOAL

The goal of our pilot project is to give our public health officials an additional tool to monitor and dramatically reduce illness spread from COVID-19, flu, cold and more by providing real time data to speed the public health policy cycle. The pilot project hinges on a technological platform developed by Kinsa that aggregates body temperature data. The City is looking to accelerate the statistical confidence of the tool via rapid deployment of 600 additional thermometers into voluntary households that will provide the maximum surveillance benefit for community monitoring. Between the 600 units, and the already deployed units from historical commercial sales, we are looking to have participation of 10% of City households to create a high statistical confidence monitoring network. It is anticipated that the City pilot project will be the densest temperature sentinel network to date. Besides protecting the health of our neighbors in the City of St. Augustine, the pilot results may lead to an evolution and change in the nation's public health monitoring programs.

The network will be used to develop an operational real-time monitoring system for public health officials, adding important data to existing COVID-19 responses and recovery. Importantly, it also provides a potential communication tool to aid in quick government decision making. It can then monitor the performance of public health policy decisions such as "social distancing" guidelines and mandates. Our pilot could provide the baseline information necessary for a nation wide approach that would allow government officials to better prevent, mitigate, and control the transmission of COVID-19 and other diseases.

The network will be immediately useful today and provide a dense sentinel monitoring network for a possible second wave of COVID-19 that may occur in the fall. This is a major additional benefit.

BACKGROUND

Kinsa has over 1 million smart thermometers in homes across America today -- over 90% of the market -- and with these real-time sensors is able to [accurately predict](#) how flu is spreading across the country. In February, Kinsa

modified this tool to identify anomalous spikes in fever which cannot be explained by seasonal flu trends -- and in many cases, this is the first and only signal of COVID-19 spreading in a community. A public website sharing this information was launched on March 18 at healthweather.us and profiled in the [NY Times](https://www.nytimes.com) and other publications.

PROPOSAL

1. The City will work with Kinsa to **create a dashboard** for monitoring and response specific to our City for use by public health officials and first responders.
2. **Distribute 600 additional thermometers** to households in the City to achieve a level of surveillance resolution that will allow for an even more localized 'signal' of possible COVID-19 spread. The City-purchased thermometers will be distributed at cost (\$20 each) with Kinsa's in-kind support for dashboard development and back-end support.

This is an opportunity to make decisions with real data on whether our responses are having an impact within days instead of weeks or months. It uses the same principles of public health monitoring, but much more quickly. Speed is the key to limiting disease spread.

NETWORK DESIGN

The 600 units will be distributed to targeted households with the priority distribution as follows:

1. Larger households, where COVID-19 is likely to linger longer, leading to unwitting spread once social distancing regulations are relaxed.
2. Families in underserved communities, which typically seek care and treatment later, potentially spreading the virus before testing and treatment occur.
3. Families of first responders who are most likely to have contact with COVID-19 (note: this does not include distribution to clinicians for use in provider settings; Kinsa's thermometers and surveillance are designed for use at home).

DEPLOYMENT

What's important when distributing these thermometers is ensuring a high activation rate. Otherwise, we will not be able to increase the granularity of the data in the City. There needs to be an *opt-in* so that the people who get the thermometers, use and therefore automatically transmit the data via the app. An opt-in is by voluntary participation. It would be preferable to work with the St. Johns County School District to facilitate finding participants.

The City can do a public messaging campaign to find participants and screen callers using a checklist of preferred criteria. We can use our utility customer service representatives or other City phone banks to screen and select participants. Currently, there is low call load to City offices. In other words, we will use our current customer service infrastructure that has been idled down due to the drop in call and walk-in volume from the coronavirus pandemic.

The units can be delivered to the selected households by city employees following good hygiene practices for package delivery. Our employees know our city and our residents; we can distribute the units within a few days.

COMMUNICATION

Our communications team can use our social media and other traditional platforms to communicate to the public. Mr. Singh and Dr. Shah will also do their best to communicate the importance and innovative nature of the program to our community. Dr. Shah carries a large COVID-19 patient case load in the San Francisco Area and Mr. Singh is also busy working with public health officials to track and slow the coronavirus pandemic. Given their time demand, they will do their best to participate in a virtual City Commission meeting in the immediate future.

Dr. Shah, Mr. Singh and I hope our project leads to improving our public health policy and protecting the health of the City through community collaboration. Our City hopefully will also have an impact in the evolution of

technological approaches to public health at the national level.

Again, the three of us would like to thank Commissioner Nancy Sikes-Kline. Without her, this collaboration would not have occurred. If you have any questions, please do not hesitate to call me at (904) 669-1873.

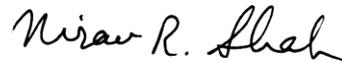
Sincerely,



John Regan, P.E.
City Manager,
City of St. Augustine



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CEO & Founder, Kinsa
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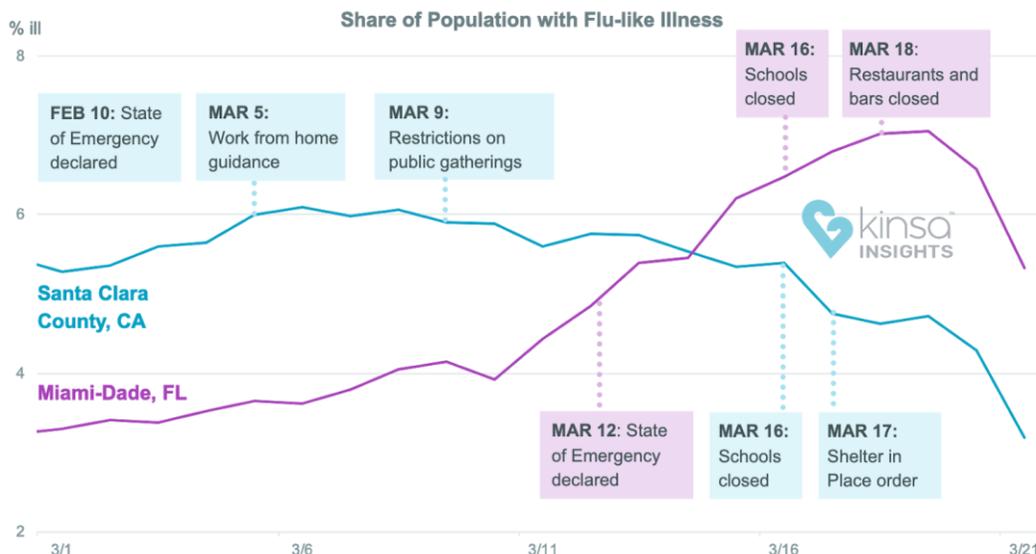
ADDITIONAL BACKGROUND

COVID-19 is spreading quickly throughout the United States. For the coming weeks we lack adequate lab-based testing capacity, personal protective equipment, and clinical staff to conduct the widespread testing seen in countries such as South Korea where the virus has been held in check. To contain the spread and efficiently target limited resources in the US, we need real-time tools that will help us predict where cases are being missed.

Data feeds from clinical locations such as emergency rooms don't help, as only a fraction of total cases show up in clinical care sites, and by then it's too late for containment. And as we've learned from China, most cases are spreading in the community because people don't know they are infected. Yet there is hope: since March 18th — as reported in the [NY Times](#) — real-time data from a network of over 1 million smart thermometers in homes has been identifying abnormal clusters of fever throughout the United States, consistent with COVID-19 in the community. Kinsa Health released this county-level data at <https://healthweather.us> to provide a tool to help stem the crisis.

HOW DOES IT WORK?

Over the past 7 years, Kinsa worked with leading scientists to create forecasting models that can accurately predict flu 20 weeks before a spike is seen in a community, using data from Kinsa's smart thermometer network. This compares to CDC models where high quality predictions extend only 3 weeks. Further, Kinsa models accurately predict flu patterns to the county level while CDC models only have granularity to the multi-state level. By taking actual, real-time levels of fever in a community from the smart thermometer network, and subtracting out the expected cases predicted by the forecasting model, Kinsa can see what's left behind — in many cases, clusters of COVID-19. Spikes in illness are represented in red in the map at the end of this memo.

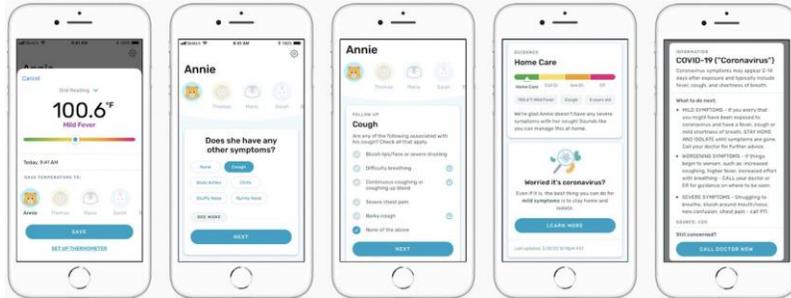


As shown in the figure above, this tracking system not only allows for hotspotting of COVID-19 in the community, but also helps evaluate the effectiveness of various public health responses in containing spread -- earlier interventions in Santa Clara correlate with a quicker “flattening of the curve.”

KINSA SMART THERMOMETERS AND APP

Kinsa smart thermometers are used together with a mobile application, which can be customized to direct users to appropriate local resources (e.g. clinical testing sites) or communicate targeted public health messages specific to their geographic location.

When paired with SARS-CoV-2 testing and other public health measures, such a system is a complete solution for outbreak surveillance and response. As additional Kinsa smart thermometers are distributed in a community, the ability to achieve higher fidelity signals and faster, more targeted response also increases.

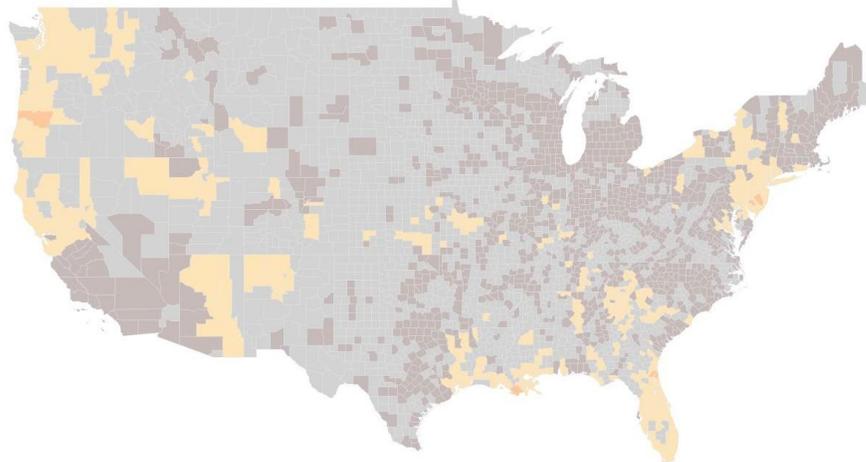


Kinsa Triage App

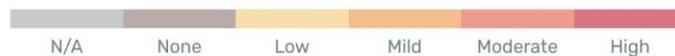


QuickCare and SmartEar

Thermometers The latest country-wide map is available at [healthweather.us](https://www.healthweather.us). The sample below is from March 8, 2020 before most testing began.



Kinsa temperature map of Smart Thermometers
Atypical Illness Levels [?](#)



Appendix. Additional links to Background Information

Public Health Authors

Inder Singh

CEO & Founder, Kinsa Inc.,

Former Executive Vice President, Clinton Health Access Initiative

Inder Singh is the founder & CEO of Kinsa, which is using mobile technologies to create a real-time map of human health to track—and stop—the spread of communicable illness. Prior to founding Kinsa, Inder was the Executive Vice President of the Clinton Foundation's Health Access Initiative (CHAI). While at CHAI, Inder brokered deals between 70 governments and 22 pharmaceutical companies that resulted in nearly \$1.5 billion in cost savings from lower priced drugs and diagnostics for HIV/ AIDS, malaria, and TB. Inder holds five academic degrees, including three graduate degrees from Harvard and MIT.

Dr. Nirav Shah

Senior Scholar, Stanford University

Former commissioner, NY State Department of Health

Nirav R. Shah, MD, MPH, is Senior Scholar at Stanford University's School of Medicine. He is a global leader in digital health and innovation, improving care for older adults, patient safety and quality, and the strategies required to transition to high value, patient-centered care. Board-certified in Internal Medicine, Dr. Shah is a graduate of Harvard College and Yale School of Medicine, and is an elected member of the National Academy of Medicine. Dr. Shah serves as an independent director for public and private companies and foundations and helps set the nation's public health priorities as a member of the HHS Secretary's Advisory Committee (Healthy People 2030). Previously, he served as senior vice president and Chief Operating Officer for clinical operations for Kaiser Permanente in Southern California, and as Commissioner of the New York State Department of Health.

John Regan, P.E.

City Manager, City of St. Augustine

Former Senior Environmental Engineer, Gainesville Regional Utilities (GRU)

John Regan, P.E. is the City Manager and is a Professional Engineer. While at GRU, he was known for establishing monitoring networks that led to the protection of the public water supply from two contamination sites (\$.15 billion in remediation). He also managed the resolution of a water distribution system *Cryptosporidium Parvum* Outbreak. John is a graduate of the University of Florida in Environmental Engineering with a minor in Environmental Sciences. He has also been awarded the Order of Isabella the Catholic by Felipe VI, King of Spain.

Reading References

[New York Times Article Kinsa thermometers 3/18/20](#)

[Miami Herald Article 3/20/20 Florida compare to New York](#)

[The Power Of Purpose: How Kinsa Is Tackling Illness In Real ...](#)

[ABC News Article 3/26/20 St Augustine](#)

[Restrictions Are Slowing Coronavirus Infections ... - nytimes.com](#)

[Kinsa website](#)