

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

2020 Overarching Jurisdictional SARS-COV-2 Testing Strategy

Jurisdiction:	Houston
Population Size:	2,343,365

1. Describe the overarching testing strategy in your state or jurisdiction.

Increase Testing to enhance detection of new infections

A. Expanding testing in Houston

Goals: Expand access to and sustain testing across Houston.

The current literature and guidance suggest that we provide testing to both symptomatic and asymptomatic persons, since a large percentage of infected persons are asymptomatic. We plan to increase testing capacity substantially to support geographic areas of the city with low testing saturation. HHD used a strategic approach to ensure that our residents had a baseline level of access to testing and testing was equitable based on vulnerability. Access and equity was based on 1) low levels of testing penetration, 2) zip codes with more than 20% of the population living below the Federal Poverty Level and 3) zip codes identified by UT School of Public Health as those where there was a greater likelihood of residents having poorer outcomes from the COVID-19 infection. Testing penetration was geographically overlaid with areas with vulnerable populations under the Federal Poverty Level (FPL) that are most likely to have the poorest outcomes from a COVID. Beginning in July, having met our initial testing penetration target, mobile testing efforts are focused on areas with the highest positivity or case density rates. We plan to achieve:

- a) Testing at a level of 2% of our population size (minimum 46,000 tests/month)
- b) Decline in positivity rates - Less than 10% of all tested are positive

Currently, HHD has not found utility in using point of care testing platforms for outbreak control in the settings that we seen thus far (nursing homes, homeless shelter). HHD has coordinating with the Harris County Jail and attempting to get them access to an Abbott ID Now platform.

B. Strategies HHD will use to increase testing:

- I. Fixed Sites for community-based testing.
- II. Mobile testing with equipped vans at high positivity zip codes.
- III. Special population strike teams for testing in long term care facilities, homeless shelters, other congregate sites.
- IV. At-home testing for elderly, disabled, caregivers, veterans, newly released incarcerated
- V. Testing by our partners at FQHCs, hospitals, healthcare systems, state health departments and commercial clinics.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

a) Fixed Sites: Through various partnerships, such as with United Memorial Medical Center (UMMC), FEMA, the State of Texas and commercial partners like CVS, Walgreens, and WalMart HHD has coordinated, supported, and promoted drive-through fixed testing sites across Houston. Currently the two community based (mass) testing sites (CBTS) have increased capacity to 650 tests per day. As the federal and state support for these sites winds down Houston will execute purchase orders and contracts to sustain and augment capacity to 750 tests/day/site. Houston plans to develop up to four quadrant based fixed (anchor) sites to replace the CBTS sites and enhance capacity to 9000 tests per week. Access is for these sites is open to anyone that wants to be tested.

b) Mobile Sites: HHD and its partners (UMMC, Kroger, TDEM, FEMA, National Guard, USPHS) will use multiple mobile teams to rotate through communities to provide community-based access in low testing and high positivity or high case density areas, with the help of this funding. Communities that experience significant access barriers will also benefit from the testing through mobile units. The HHD mobile units each have a capacity of 250 tests per day with potential to surge as needed.

c) Special Population Strike Teams/Outbreak Teams: HHD will expand use of “pop up” sites and use strike teams that can be deployed within 48 hours to address vulnerable populations. The HHD nursing home strike team initiated testing in over 200 Long-Term Care facility (staff and residents). Strike teams have also been deployed to test high-risk settings including homeless shelters, juvenile detention, and transitional housing. The strike teams will also target specific populations, individuals and neighborhoods that are physically, socially or economically vulnerable through a mix of targeted closed population and open public outreach.

Outbreak teams: HHD has developed two classes of outbreak teams. The first class focuses on licensed medical long term care facilities (LTCFs) and the other on non-medical congregate or semi-congregate facilities like homeless shelters, transitional housing, boarding or lodging homes, colleges, and jails/detention facilities. The core of either outbreak team class are Epidemiologists and Surveillance Investigators. LTCF outbreak teams are augmented with paramedics from the Houston Fire Department. For the LTCFs, a baseline of testing across all nursing home facilities was completed in early June. A recurrent testing program that tests all staff on a weekly basis has been adopted.

These outbreak teams can be triggered by emerging cases or consultative requests. Cases or clusters are assigned to the outbreak team so that contact tracing happens swiftly and in a coordinated manner. Currently all of the outbreak control and prevention work that HHD is conducting utilizes RT-PCR testing. For all confirmed cases, a new software package has been implemented that automates the collection of health self-assessment and close contact information via an online tool deployed by email or text message.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

e) At-Home Testing: Recognizing that some people are not able to go to a testing site, HHD has implemented access to at-home testing. This access makes testing available to those who cannot get to a site for a variety of reasons. Testing enhancement through partnerships with academic and community-based organizations: HHD will develop contracts with academic and community-based partners to support testing for their populations through provision of supplies or cost of lab work.

f) Testing by our partners: Leveraging and supporting FQHCs, hospitals, healthcare systems, health departments, and commercial clinics. HHD has coordinated with FQHCs and provided four sites with point of care testing equipment. HHD has leveraged relationships with local health departments and health systems to establish the first community based testing site, prior to FEMA support.

g) Public Health lab capacity enhancement: The Houston Health Department Bureau of Laboratory Services will expand its testing capacity by shoring up its ability to perform the CDC assay, establishing a SARS-CoV-2 assay on high throughput instruments (Hologic Panther), establishing immunologic testing on multiple platforms (BioRad EVOLIS and Diasorin Liaison), and establish a rapid diagnostic platform that can diagnose SARS-CoV-2 along with other common respiratory pathogens. Each instrument is capable of testing 350-500 samples daily. In conjunction with the CDC assay this will push the laboratory's diagnostic capacity to over 1,000 tests daily

h) Contracts with Laboratories: HHD is currently working with an academic partner to provide testing through Federally Qualified Health Centers. HHD will expand the current contract to increase lab capacity and initiate additional contracts with laboratories.

C. Expand serology testing through academic partners: Once reliable serology tests are available, academic partners will conduct serology testing at the population level. HHD will provide support for supplies or laboratory work in some instances. In addition to serology testing at the local universities, serology testing at the city level will help us understand the immunity status of the population and what that may mean. HHD is currently in conversations with CDC Director Redfield to develop and implement a seroprevalence study in Houston. HHD will coordinate with partners and consider appropriate methods including convenience, geographic, and targeted population samples.

D. Obtaining count of total testing in Houston: HHD is working with partnering laboratories that test samples from our jurisdiction but do not send us the negative tests for COVID-19. Not having the negative results hampers clear understanding of the full extent of testing in Houston. Current efforts are ongoing to get the negative tests and to get all labs to send us the number of tests conducted daily. We have also created an online form that our partner organizations populate daily to report the number of tests conducted daily. To ascertain best practices and to better assess the needs of area partners HHD will implement recurring teleconference calls for ordering and specimen collection providers and lab testing providers. This communication platform will form the basis for determining the current state of

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

equipment platforms, testing supplies, reagents, PPE, staffing, and the like, including the development of additional survey tools.

k) Increase Testing Capacity through equipment and additional platforms: Depending on need, HHD will purchase additional testing equipment to increase the level of testing. For example, HHD has provided rapid PCR point of care testing equipment to three FQHC's, so that testing can continue.

Table #1B below represents the current snapshot of testing coordinated with HHD or submitted to HHD via ELRs as a baseline rather than planned expansion.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Table #1a: Number of individuals planned to be tested, by month

BY MONTH:	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
Diagnostics*	47,954	50,000	50,000	50,000	50,000	50,000	50,000	50,000	397,954
Serology	0	0	tbd	tbd	tbd	tbd	tbd	tbd	0
TOTAL	47,954	50,000	50,000	50,000	50,000	50,000	50,000	50,000	

*Each jurisdiction is expected to expand testing to reach a minimum of 2% of the jurisdictional population.

Table #1b: Planned expansion of testing jurisdiction-wide

Name of testing entity	Testing venue (select from drop down)	Performing Lab (if different from testing entity)	Daily diagnostic through-put	Daily serologic through-put	Specific at-risk populations targeted (list all)
Butler Stadium CBTS	Community-based	Quest	650	0	unrestricted open access drive through ages 5 yrs and up
Delmar Stadium CBTS	Community-based	Labcorp	650	0	unrestricted open access drive through ages 5 yrs and up
Texas Dept of Emergency Management (team 1)	Community-based	state consortium of university and LRN labs	250	0	unrestricted open access drive through ages 5 yrs and up, one person per household
Texas Dept of Emergency	Community-based	state consortium of	250	0	unrestricted open access drive through ages 5 yrs and up

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Name of testing entity	Testing venue (select from drop down)	Performing Lab (if different from testing entity)	Daily diagnostic through-put	Daily serologic through-put	Specific at-risk populations targeted (list all)
Management (team 2)		university and LRN labs			
Spring Branch CHC	Federally Qualified Health Center		25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
Lone Star Circle of Care	Federally Qualified Health Center		25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
El Centro de Corazon	Federally Qualified Health Center		25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
UMMC	Drive-thru testing site	Medscan	1,750		7 sites unrestricted access
Legacy	Federally Qualified Health Center	unknown	25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
Stephen F Austin CHC	Federally Qualified Health Center	unknown	25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Name of testing entity	Testing venue (select from drop down)	Performing Lab (if different from testing entity)	Daily diagnostic through-put	Daily serologic through-put	Specific at-risk populations targeted (list all)
Hope Clinic	Federally Qualified Health Center	unknown	25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
Avenue 360	Federally Qualified Health Center	Baylor College of Medicine	25		Proposed capacity per site which has not yet been fully demonstrated. Testing for qualifying patients.
CVS	Drug store or pharmacy	unknown	850		drive through model, self collection, 18 years and older, by appointment. Current available at 17 sites and still expanding, estimated capacity of 50 tests/day/site
Walgreens	Drug store or pharmacy		150		drive through model, 18 years and older, by appointment. Current available at 3 sites and still expanding, estimated capacity of 50 tests/day/site
HHD LRN Lab	Public health lab		250		high risk congregate settings like LTCFs, homeless shelters, support for other LHDs. Increasing capacity to 1000/day next month
Ibn Sina Foundation/CVS	Community-based		50		by appointment
Texas Dept of Emergency	Community-based	Curative Labs	750	0	unrestricted open access drive through ages 5 yrs and up

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Name of testing entity	Testing venue (select from drop down)	Performing Lab (if different from testing entity)	Daily diagnostic through-put	Daily serologic through-put	Specific at-risk populations targeted (list all)
Management (teams 3-5)					
Noted below is a snapshot of current capacity based on ELRs submitted:					
Access Dx Lab	Commercial or private lab		10		
Texas Childrens Hospital	Hospitals or clinical facility		200		children
Altru Diagnostics	Commercial or private lab		21		
American Institute of Toxicology	Commercial or private lab		8		
ARUP	Commercial or private lab		29		
UTMB	Hospitals or clinical facility		423		patients

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

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Baylor University Medical Center	Hospitals or clinical facility		1		patients
Bio Ref	Commercial or private lab		131		
UTMB Laboratory Services-Clear Lake Campus	Hospitals or clinical facility		20		patients
Viracor	Commercial or private lab		3		
CPL	Commercial or private lab		160		
Davita Labs	Commercial or private lab		3		
Diagnostic Laboratory of Oklahoma	Commercial or private lab		1		
Fulgent Diagnostics	Commercial or private lab		3		

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Name of testing entity	Testing venue (select from drop down)	Performing Lab (if different from testing entity)	Daily diagnostic through-put	Daily serologic through-put	Specific at-risk populations targeted (list all)
Galveston National Laboratory	Commercial or private lab		278		
GenebyGene	Commercial or private lab		1		
Genesis Diagnostics	Commercial or private lab		2		
Gibson Diagnostic Labs	Commercial or private lab		1		
Harris Health	Hospitals or clinical facility		65		patients
HCA	Hospitals or clinical facility		1		patients
Houston Methodist	Hospitals or clinical facility		353		patients
ISPM Labs	Commercial or private lab		4		
Labcorp	Commercial or private lab		782		average daily ELR report to HHD

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

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Mayo	Hospitals or clinical facility		14		
MD Anderson	Hospitals or clinical facility		1		patients
Med Fusion	Commercial or private lab		5		
Medical Diagnostic	Commercial or private lab		1		
Medscan Laboratory	Commercial or private lab		5		
Memorial Hermann	Hospitals or clinical facility		321		patients
VAMC	Hospitals or clinical facility		1		Veterans Affairs Medical Center patients
Quest	Commercial or private lab		1,135		

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

2020 Direct Expansion of SARS-COV-2 Testing by Health Departments

2. Describe your public health department's direct impact on testing expansion in your jurisdiction.

2. a) Surge Capacity: Current NSSP data indicates that for the period between June 10th to July 7th over 80,000 COVID-19 test results were reported for City of Houston residents.

Initial surge capacity was provided through federal and state support through CBTS and Texas Division of Emergency Management (TDEM) mobile testing team (MTT) augmentations and lab capacity arrangements. In parallel to those initiatives HHD has contracted additional local surge capacity and has directed numerous supplemental providers with capacities to collect specimens, conduct lab analysis, provide test result communications and medical support to impacted individuals to register as a City Vendor so that they may be available contingent on need. The HHD Lab has purchased new equipment and augmented testing capacity by nearly 5 times. HHD has sourced personnel resources on loan from the Houston Crime Lab to assist with testing operations. Internally HHD surged staff to support testing operations at the lab. For field operations to collect specimens and respond to outbreaks multiple teams have been developed and personnel from the Fire Department leveraged to support. To assist with hard to reach communities several contracts and partnerships have been executed including Spanish language capabilities. Public facing website materials include multiple languages (English, Spanish, Arabic, Chinese, Vietnamese, and French) and American Sign Language interpretations.

The HHD Bureau of Laboratory Services is addressing surge capacity by increasing its own testing capacity as well as implementing contractual agreements with reference laboratories that currently have underutilized capacity.

The laboratory is increasing its internal capacity by diversifying its testing portfolio and increasing its skilled workforce to accommodate two full shifts. The laboratory is currently performing two assays for the detection of SARS-CoV-2, the CDC assay and the Hologic Panther Assay. This decreases the laboratory's dependence on a single reagent supplier and, in the case of Hologic Panther, greatly increases the throughput. As the Hologic Panther supply chain has become increasingly stressed the laboratory is considering additional extraction platforms and a second PCR assay that would allow more samples per plate, thus increasing throughput and further diversifying suppliers. Parallel to this instrument procurement the laboratory is initiating a second round of hiring. The laboratory plans on doubling its SARS-CoV-2 workforce (testing and support personnel) effectively doubling potential capacity by adding a second shift.

HHD has implemented contracts with two local reference laboratories that have reported available capacity to accommodate HHD specimen collection sites within designated turnaround time. These testing partners are able to accommodate fixed sites with steady volumes which allows the HHD laboratory to absorb surge related testing throughout in both the City of Houston as well as the rest of 6/5 South.

Equipment enhancements needed include the following:

2 Extraction Platform with service package

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

3 ABI 7500

Diasorin Liaison Test System

2 GenMark ePlex module

2 Refrigerated centrifuge

MiSeq System

Eppendorf epMotion 5075

EZ1 Automated Extraction Platform

2 Building B Autoclaves

Mobile Laboratory Addition

b) Testing needs for Vulnerable, At-Risk and Homebound Populations

As a result of COVID-19, the vulnerable and at-risk populations like elderly (seniors), disabled, caregivers, veterans and those recently released from incarceration facilities with multiple comorbidities, also those homebound and in fragile health, face formidable challenges.

Vulnerable populations like homebound seniors and people with disabilities are at risk for increased morbidity and mortality due to COVID. Special Populations who are at higher risk of disease transmission due to crowded living conditions include residents in jails, detention centers, long term care facilities, nursing homes and the homeless. HHD proposes to provide options for repeat in-home or point in time PCR testing for these groups as a step to minimize the spread of COVID-19.

Seniors and Caregivers: Many older adults who are non-ambulatory and their caregivers are in these high-risk categories are prime candidates for in-home testing because of their travel limitations and risk of exposure. HHD proposes to offer in-home testing and support in coordination with local partners to meet the needs of the city's most vulnerable seniors and their caregivers.

Disabled: People with disabilities may also be disproportionately impacted by the outbreak because of serious disruptions to the services they rely on. Many have difficulty with social distancing because of additional support needs or because they are institutionalized. Routine in-home coronavirus testing offers a level of support that will reduce their risk of serious health complications and reduce exposure as a result of community-based testing.

Nursing Homes and Long-Term Care Facilities: HHD and its partners assessed over 300 nursing facilities with an expanded CDC ICAR tool. Facilities with multiple structural or procedural vulnerabilities were revisited and testing was initiated among staff and residents. Testing is expected to be offered on a regular schedule along with infection control training and guidance to identify specific conditions that pose a risk for the health and safety for the staff or the residents.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Veterans: The Veterans Administration has documented that many veterans are often homebound due to the severity of their comorbidities. Veterans are often isolated and there are some who have caregivers who often experience a hefty burden. HHD proposes to offer in home testing to these veterans and their caregivers to alleviate the challenges they face with scheduling and being transported to community-based testing sites.

Recently Released Incarcerated Population (Older Adults, Medically Fragile or Person with Disabilities): As a result of recent legislation and other mandatory release requirements, formerly incarcerated individuals residing in the Houston area that identify as older adults, medically fragile and/or individuals with disabilities have been released recently. HHD intends to offer point in time and/or in home COVID-19 testing, education and other community resources to this population to limit the spread of infection among this group as their access to supports is limited.

Homeless: HHD is testing at multiple homeless shelters and facilitating and advising on isolation and quarantine. The homeless shelters vary in size and type of facilities and so far, the COVID positivity rate ranges from 0-50%.

c) Barriers to testing

Consistency and scaling of testing at a minimum of 2% of the population requires extensive end to end coordination and logistical considerations between the staff responsible for testing, site, supply chain, data collection, data reporting to local public health departments, CDC, data analysis and information transformation for public consumption. Supply chain shortages and disruptions will be mitigated via working with secondary and contingency providers and partners ranging from selection and access to appropriate supplies and collection techniques including self-collection, at home testing, outdoor and indoor collection environments; PPE, infection control procedures, decontamination; heat stress implications for staffers, cold chain management of specimens; lab capacity enhancements and method validation studies; to reporting systems and data quality/timeliness issues. To protect against underutilization of available assets a multifaceted data-driven approach will be augmented using these grant resources. The approach relies on extensive situational awareness data monitoring to assess testing penetration, distribution, disproportionate access and cultural/socioeconomic barriers to testing. Coordination and collaboration with community partners on messaging is important to provide the breadth of open access, sentinel, population monitoring, diagnostic, risk and setting-based recurrent testing.

d) Expand lab capacity for serology testing:

HHD laboratory will test for COVID-19 antibodies in serum and plasma using a high throughput automated analyzer that employs the enzyme-linked immunoassay (EIA) principle. A “total” antibody assay will be used that detects antibodies that span the breadth of the immunologic response (i.e. IgA, IgM, and IgG production), and that detects infection during the “window” period between replicating virus detection by molecular procedures and appearance of IgG antibodies. A second assay that solely detects IgG antibodies will also be used to determine acquired immunity; thereby, signifying recovery.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

HHD will also capitalize on pre-existing relationships with surrounding local partners to expand laboratory capacity. Serology testing will provide important data on monitoring and surveillance.

e) Resource Utilization, community mitigation and sentinel surveillance:

A strong sentinel surveillance system will help inform whether additional community mitigation strategies or easing of restrictions are required. HHD utilizes several data sources to understand the spread of COVID 19. The integration of surveillance to monitor trends in outpatient settings, emergency departments, implemented together with hospital-based surveillance, mortality surveillance, wastewater monitoring, monitoring trends at vulnerable congregate settings such as nursing homes, long term care facilities, homeless shelters, colleges and universities coupled with serologic surveys, can provide a multifaceted approach to monitor the epidemiology of COVID-19 and guide community mitigation strategies.

f) Procurement, hiring and onboarding:

HHD plans to make all purchases in accordance with 2 CFR 200. We will streamline and expedite procurement of test kits, reagents and other supplies by quickly assessing what goods and services are needed. Under a public health disaster declaration, we are allowed expedited purchasing of items pertaining to the disaster. Once the declaration expires, we will identify the quickest methods of procurement. For goods or services needing a competitive bid process we will ensure our purchasing department prioritized our requests and reduced the timeframe for each step of the process as much as possible. Numerous vendors have already solicited HHD with offers to provide testing supplies, reagents, lab testing capacity, specimen collection services, and comprehensive collection, testing, and medical services. Processes for vetting vendors and PPE materials, and a range of services (e.g. sterilization of N95 respirators). Resources provided through this grant will assist in implementing remedies to problems that have already been identified with sustained quality assurance/quality improvement problem-solving efforts. HHD will acquire supplies through SETRAC (SouthEast Texas Regional Advisory Council) and other partners. HHD will also approach non-traditional and vetted suppliers and vendors to quickly acquire testing supplies. HHD will have a team of individuals that will expedite hiring staff.

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

Table #2: Planned expansion of testing driven by public health departments

BY MONTH:	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
Number of additional* staff to meet planned testing levels		7	20	20	10				57
FOR DIAGNOSTIC TESTING									
How many additional* testing equipment/ devices are needed to meet planned testing levels? (provide an estimated number, and include platform details in narrative above)		0	15						15

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

BY MONTH:	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
Volume of additional swabs needed to meet planned testing levels ⁺⁺		included below	included below	included below	included below	included below	included below	included below	0
Volume of additional media (VTM, MTM, saline, etc.) needed to meet planned testing levels ⁺⁺		7,000 Aptima Multitest Collectors	36000 sample collection kits	36000 sample collection kits	36000 sample collection kits	36000 sample collection kits	36000 sample collection kits	36000 sample collection kits	0

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

BY MONTH:	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
Volume of additional reagents needed to meet planned testing levels, by testing unit and platform (i.e. 100K/day - Hologic panther; 100k/day - Thermofisher)		1,000/day Hologic SARS-COV-2 assay starting week 4	1,000/day Hologic SARS-COV-2 assay	1,000/day Hologic SARS-COV-2 assay	1,000/day Hologic SARS-COV-2 assay	1,000/day Hologic SARS-COV-2 assay	1,000/day Hologic SARS-COV-2 assay	1,000/day Hologic SARS-COV-2 assay	
FOR SEROLOGIC TESTING									
Number of additional* equipment and devices to meet planned testing levels		0-Serology testing starting in July	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	0

ELC ENHANCING DETECTION: HOUSTON TESTING PLAN

BY MONTH:	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
Volume of additional reagents needed to meet planned testing levels, by testing unit and platform (i.e. 100K/day - Hologic panther; 100k/day - Thermofisher)		0-Serology testing Starting in July	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	TBD-pending test selection, study design & partner support	

* Report new monthly additions only, not cumulative levels

++ For May and June, only include needs beyond the supplies provided by FEMA. Report new monthly additions only, not cumulative levels.