2020 Overarching Jurisdictional SARS-COV-2 Testing Strategy

Jurisdiction:	Missouri
Population Size:	6.137 million

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

The State of Missouri has a comprehensive testing strategy with multiple lines of effort, which prioritizes vulnerable populations and acknowledges private demand for diagnostic testing. The state is currently developing a plan for serological testing, but as its utility for individual citizens is still unknown, serological testing will be used for research purposes, until more information is available about potential immunity and timelines. Missouri's statewide testing strategy includes:

*Messaging to the public, providers, laboratories, and test collection locations; dedicated Department of Health and Senior Services (DHSS) Health Educators under the direction of DHSS leadership and the DHSS Office of Public Health Information will be employed to enhance these activities

*Prioritized testing for healthcare workers and first responders

*Box-in Outbreaks at State Facilities (such as those run by the Departments of Mental Health and Corrections)

*Box-in Outbreaks at Non-State, Public Facilities (such as county jails and shelters)

*Box-in Outbreaks at Long Term Care Facilities (LTCFs)

*Box-in Outbreaks at Prioritized Employers (such as meatpacking plants and factories)

*Community Testing and Prevalence Studies

*Sentinel Testing of Vulnerable Populations (such as LTCFs and other congregate care settings)

*Baseline Operations of the Missouri State Public Health Laboratory (MSPHL)

*Sector Security (including education and employers)

*Individual Diagnostic Testing (including anticipated increased demand during cold and flu season)

Testing platforms include contractors who can provide testing throughout the state while others are limited to regional efforts. Each contract will be maximized through coordination with DHSS, local public health agencies (LPHAs), and healthcare providers. PCR resources available at the MSPHL will provide testing as part of the State's "Box-in" strategy, sentinel testing of vulnerable populations (such as LTCFs), and as the provider of last resort for outbreaks among vulnerable populations. Additional considerations are being made for expansion of MSPHL capacities along with the capacities of LPHAs. Point-of-Care machines (currently Abbott ID-NOW) are located in 14 locations throughout the state. POC platforms are used at the discretion of LPHAs and have recently been utilized in response to outbreaks in long-term care facilities. One unit is deployable as a mobile option through collaboration with the Missouri National Guard.

Additionally, the State of Missouri will provide first-round or initial testing of all long term care facilities (LTCFs) with recent or past cases as the payor of last resort. Facilities with cases are the current priority followed by facilities where a case was identified in the recent past. DHSS is working closely with local public health as outbreaks are identified as part of its industry security strategy. As cases are identified where exposures occur within large-scale workplaces, coordination and facilitation of testing resource linkages to employers occur with the employer assuming costs of testing.

Community testing at non-traditional sites began in May and will extend through the remainder of 2020. Sentinel testing among populations receiving direct care from State of Missouri agencies will continue as a priority. Discussions are ongoing with non-traditional providers and sites throughout the state.

In May and June, daily averages of respectively 769 and 650 serology results were reported to the State from non-public health laboratories. The number of reported serology tests is expected to increase as more serology laboratories come online. Serology results from commercial laboratories will be used for surveillance purposes and assessing the prevalence of prior infections as they are available. Serology testing at the MSPHL went live in June 2020.

Communication, collaboration, and coordination with testing resource contractors will be maintained through usual conduits. Their capacities are monitored to ensure contract maximization through effective and efficient use throughout the State or where regionalization can occur. MSPHL communications are disseminated on a regular basis and as information changes. The MSPHL is part of the Division of Community and Public Health, the applying agency of DHSS.

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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*	123,000	159,450	200,000	450,000	450,000	450,000	450,000	450,000	2,732,450
Serology	20,000	20,000	25,000	30,000	30,000	30,000	30,000	30,000	215,000
TOTAL	143,000	179,450	225,000	480,000	480,000	480,000	480,000	480,000	

*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)
Barnes Jewish Hospital System	Hospitals or clinical facility	in-house	800	0	Patients being prepared to undergo various elective surgeries as well as staff
Genetrait	Commercial or private lab	in-house	2,000	0	Patients, hospital staff, sentinal testing, congregate settings
Mercy Hospital System	Hospitals or clinical facility	in-house	750	0	Patients being prepared to undergo various elective surgeries as well as staff
Quest Diagnostics	Commercial or private lab	in-house	3,550	0	Patients, hospital staff, sentinal testing, congregate settings, community testing

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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)
St. Luke's Hospital System	Hospitals or clinical facility	in-house	725	0	Patients being prepared to undergo various elective surgeries as well as staff
Truman Medical Center	Hospitals or clinical facility	in-house	725	0	Patients being prepared to undergo various elective surgeries as well as staff
Gamma Healthcare	Commercial or private lab	in-house	800	0	Nursing homes
Ten Healthcare	Commercial or private lab	in-house	180	0	Nursing homes and patients being prepared to undergo various elective surgeries as well as staff
Quest Diagnostics	Commercial or private lab	in-house		800	Patients
SPHL	Public health lab	in-house		250	Surveillance
SPHL	Public health lab	in-house	1,500	0	Healthcare workers
Point of Care	Hospitals or clinical facility	in-house	400	0	Box-in outbreak control (congregate settings)
CVS	Drug store or pharmacy	Unknown	1,000	0	Diagnostic / community based testing (begins in June date TBD)
Walgreens	Drug store or pharmacy	Unknown	25	0	Dignostic / community-based

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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)
Viracor - Eurofins	Commercial or private lab	in-house	1,500	0	Long term care facilities, diagnostic
LabCorp	Commercial or private lab	in-house	1,600	0	Diagnostic / community based testing
Children's Mercy Hospital	Hospitals or clinical facility	in-house	150	0	Diagnostic / Exclusive to Hospital patients and staff
MAWD	Commercial or private lab	in-house	300	0	Currently contracting to Hopital and clinic patients
North Kansas City Hospital	Hospitals or clinical facility	in-house	50	0	Diagnostic
Viracor - Eurofins	[Select One]			1,500	Diagnostic
Gamma Healthcare	[Select One]			1,500	Diagnostic for clincians needs; expanding clientele
Ten Healthcare	[Select One]			200	Diagnostic for clincians needs; expanding clientele
Truman Medical Center	[Select One]			100	Patients and employees
Barnes Jewish Hospital System	[Select One]			200	Diagnostic for patients and employees

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.

DHSS has expanded testing capacity through 14 contracts with 11 laboratories that support statewide and regional testing, testing in rural areas, testing of vulnerable populations, and outbreak control. Specific contracts have been executed for fast, flexible testing wherein the State can deploy tests at relatively high volumes to either state facilities or those of private partners. The State anticipates entering into additional procurement processes as technologies and collection methodologies change. Statewide throughput capacity exceeds 3.925 million tests through December.

Additional testing equipment recently obtained by the MSPHL for SARS-CoV-2 testing includes: (a) Miseq sequencer for SARS-CoV-2 sequencing work with SPHERES as well as a Minion and Voltrax, (b) Integra Assist Plus Automated pipetting system and installation for use with Voyager pipettes (quantity 4), (c) Voyager electronic adjustable, tip-spacing pipettes (quantity 6), (d) QuantStudio 7 Flex Real-time PCR system with interchangeable 96 and 384-well blocks - used with TaqPath COVID-19 PCR kit (quantity 4), (e) KingFisher instrument used to extract nucleic acid from SARS-CoV-2 samples (quantity 4).

Partnerships with community based organizations, including Federally Qualified Health Centers (FQHCs), LPHAs, and hospitals have allowed DHSS ample logistics support, and DHSS is always seeking to strengthen and expand partnerships with stakeholders. Testing for racial and ethnic minorities is facilitated through LPHAs and community-based organizations to ensure barriers to testing are eliminated. FQHCs play a crucial role in test facilitation and administration.

Vulnerable and at-risk populations were prioritized through a targeted campaign for the months of May and June to accelerate testing and will continue to be targeted through the remainder of 2020. Healthcare workers and first-responders are currently prioritized for testing at the MSPHL with a 24-hour turn-around for test results. The elderly and disabled living in congregate settings are also a priority. The state is funding baseline testing for all residents and staff at long term care facilities (LTCFs) that have had a positive case of COVID-19. These facilities are first to receive facility-wide testing as coordinated by DHSS and LPHAs. Missouri is ramping up community testing in underserved regions, rural counties, and in St. Louis and Kansas City neighborhoods which have the highest numbers of cases and hospitalizations. In May and June, Missouri completed and funded approximately 8,000 and 12,012 community tests, respectively. An average of 10,000 community tests will be completed and funded each month during the July – December 2020 timeframe.   The State of Missouri will support testing for all populations through CDC COVID-19 funds, provided all other avenues for payment have been examined and exhausted.

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Sentinel testing is being offered at all state-operated facilities housing vulnerable populations and those in congregate settings, including the Departments of Corrections, Mental Health, Youth Services, and the Veterans Commission. Monitoring for efficiencies in testing and assessing any underutilization of available assets will be conducted through partnerships with LPHAs. Three of the state's 14 contracts for testing are in the State's major metropolitan areas, allowing for greater access in the event of supply-chain or processing concerns with other contractors.

Serology testing through the MSPHL will focus on surveillance and to estimate the numbers of those previously infected. Additionally, future determinations of any correlation with immunity will make the availability of serology testing to essential workers and those who interact with vulnerable populations more likely. The Liaison XL (DiaSorin) IgG testing instrument is online as of June 8 under an FDA EUA. Expected throughput is up to 170 specimens an hour. As of May 31st, supplies for processing 10,000 specimens are on hand.

Community mitigation recommendations have been promoted since the pandemic began. Sentinel surveillance efforts among vulnerable populations began May 21. Additional sentinel surveillance efforts are underway among LTCFs known to have one positive resident/staff member. LTCFs were required to have a testing plan written, complete with testing resources in place and actionable, by June 26.

A DHSS Rapid Procurement Team will work with the State's Office of Administration (OA) Purchasing Division to perform vendor research and to obtain vendor bids for reagents, supplies, test kits, collection materials, and PPE required to expand testing capabilities as needed. These expedited processes will be used to obtain necessary supplies/equipment to conduct activities planned for the July-December 2020 timeframe and also to obtain these items if an alternate plan is needed due to unanticipated testing changes due to the fluid nature of the pandemic. Furthermore, DHSS is planning to release Notices of Opportunity by July 15 to LPHAs and private laboratories to have equipment loaned to them by DHSS to increase testing capabilities, particularly in preparation for surge volumes anticipated this fall with the onset of COVID/influenza co-morbidity. DHSS' Office of Human Resources has worked with the OA to develop a FAST-TRACK hiring process to expedite filling essential staff positions. In addition, application documents for many positions are being "cross-walked" to promote hiring of staff who have a broad range of skills and experience needed to respond to the ever-changing environment of the pandemic. These expedited hiring practices are currently being used by the MSPHL to hire essential laboratorians needed to increase Missouri's testing capabilities. Increased surge capacity will also be obtained by utilizing state employee contact tracers who can respond as "Strike Teams" to regions of the state experiencing COVID-19 flare-ups that exceed local authorities' response capabilities.

Missouri will continue its long history of improving data reporting processes. In support of the Missouri statewide testing strategy that includes messaging, outbreak response, sentinel testing, community sampling/prevalence studies, and data integration, the MSPHL will hire additional Laboratory Interoperability Technicians to assist in establishing electronic test ordering and reporting with

submitters and data reporting for surveillance. The MSPHL is considering several vendors that will assist with establishing Electronic Test Orders and Results (ETOR) goals. The MSPHL will: (a) Establish an office to work collaboratively with the OA/Information Technology Services Division (ITSD) to solely support the statewide testing strategy, (b) Work with the OA/ITSD to transition OpenELIS to the AIMS platform that will assist with future ETOR enhancements, (c) Contract with Data Innovations to interface serology and PCR testing instruments to automatically send results to OpenELIS, and (d) Work closely with the Bureau of Reportable Disease Informatics (BRDI) to achieve reporting via HL7 messaging. In addition, DHSS is deploying a new comprehensive reportable disease surveillance system, EpiTrax, which will initially be implemented for COVID-19 surveillance. EpiTrax is an open source reportable disease surveillance system that meets all national surveillance and reporting standards. This includes enhanced demographic, location, and case management information. An integral component of EpiTrax is the Electronic Messaging Staging Area (EMSA). EMSA is capable of automatically filtering, processing, and evaluating incoming electronic laboratory reporting (ELR) messages for relevance to public health, and ingesting those messages into the surveillance system. These improvements to the surveillance system and electronic reporting capability will enhance surveillance efforts, identification of vulnerable populations, and identification of outbreaks. BRDI is currently providing a line list of all processed COVID-19 test results to multiple stakeholders daily. These data are used for decision-making and are shared in aggregate form with the public through the Missouri COVID-19 dashboard. The Bureau of Communicable Disease Control and Prevention (BCDCP) along with DHSS and state leadership will use these data to develop appropriate mitigation strategies.

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	0	0	4	14	6	0	0	0	24
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	0	12	6	0	2	0	0	20

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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[++]	167,000	167,000	200,000	300,000	350,000	400,000	450,000	450,000	2,484,000
Volume of additional media (VTM, MTM, saline, etc.) needed to meet planned testing levels[++]	107,000	107,000	150,000	225,000	260,000	300,000	350,000	350,000	1,849,000

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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	0	325/day, KingFisher and Quantstudio	750/day, KingFisher and Quantstudio	1500/day, KingFisher and Quantstudio	1500/day, KingFisher and Quantstudio	1500/day, KingFisher and Quantstudio	1500/day, KingFisher and Quantstudio	
FOR SEROLOGIC TESTING									
Number of additional* equipment and devices to meet planned testing levels	0	0	1	0	0	0	0	0	1

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	0	100/day DiaSorin Liason XL	200/day DiaSorin Liason XL	200/day DiaSorin Liason XL	200/day DiaSorin Liason XL	200/day DiaSorin Liason XL	200/day DiaSorin Liason XL	

* 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.