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The Public Health Response to COVID-19 in the St. Louis Region of Missouri

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Regional Case Study Series:

The Public Health Response to COVID-19 in the St. Louis Region of Missouri

Spring 2022

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

Missouri Foundation for Health
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The George Washington Milken Institute School of Public Health advances population health, wellbeing, and social justice locally, nationally, and globally by applying public health knowledge to enhance policy, practice, and management; conducting rigorous, basic, applied, and translational research; and educating the next generation of public health leaders, policy makers, practitioners, scientists, advocates, and managers.

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The St. Louis Region's Public Health Response to COVID-19

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The Public Health Response to COVID-19 in the St. Louis Region of Missouri is one of three regional reports that offers findings from conversations with local stakeholders and residents about their experience with the state and region's pandemic response. The study focused on the period from March 2020 through May 2021, just prior to the surge caused by the delta variant and well before the emergence of the omicron variant. Its aim is to document efforts by the St. Louis region's local public health agencies (LPHAs) and a multitude of other stakeholders to combat COVID-19, and to identify lessons that could strengthen public health practices to better safeguard communities in the future.

Missouri's approach to public health is decentralized, and as such LPHAs were tasked with tapping local, regional, and state relationships and resources to wage a locally tailored response to a global virus. Uneven resources and a varied approach challenged pandemic response coordination, both regionally and across the state, despite enormous dedication by local public health; state and local elected officials; health care organizations; first responders; community non-profits; and countless others.

The four LPHAs in the St. Louis region of Missouri profiled in this report—those of the City of St. Louis, Jefferson County, St. Charles County, and St. Louis County—have been chronically underfunded compared to health departments in other states. Years of disinvestment and negligible state contributions to LPHAs took an enormous toll on staff, operations, and all other aspects of LPHAs' response to the COVID-19 pandemic. LPHAs relied heavily on external funding to meet the resource demands of the pandemic. Despite all four LPHAs receiving Coronavirus Aid, Relief, and Economic Security (CARES) Act funding, they did not ultimately have sufficient financial support to alleviate strain on public health departments. LPHAs were challenged to muster a robust pandemic response *and* maintain traditional public health programs designed to help those most in need in their communities.

Our hope is that the following key study findings will be leveraged for the purpose of strengthening the state public health system's ability to continue to respond to the COVID-19 pandemic and to face future crises with greater resources, coordination, equitable strategies, modernized infrastructure, and public trust. Because Missouri is a large and diverse state, we also acknowledge there is no single pandemic story. Experiences and events of the crisis—including the speed of the virus's spread, how infection impacted populations, and how local authorities and stakeholders responded—differed from region to region.

Readers may also be interested in the companion reports, *The Public Health Response to COVID-19 in the Northeast Region of Missouri*[1] and T*he Public Health Response*

1 Trott, J., Mead, K., Markus, A., Acosta, A., Baños, J., Conway, C., Benoit, M., and Regenstein, M. "The Public Health Response to COVID-19 in the Northeast Region of Missouri" (2022). *Health Policy and Management Issue Briefs.* https://hsrc.himmelfarb.gwu.edu/sphhs_policy_missouri/

to COVID-19 in the Southwest Region of Missouri.[2] Findings from the three reports were used to inform the state-level recommendations in our report *Missouri's Public Health Response to COVID-19: Key Findings and Recommendations for State Action and Investment*, which was developed for the purpose of strengthening the state public health system's ability to face future crises, and to capitalize on new and timely federal funding opportunities in the wake of the pandemic.[3]

2 Trott, J., Mead, K., Benoit, M., Hughes, D., Levi, J., Baños, J., Seyoum, S., and Regenstein, M. "The Public Health Response to COVID-19 in the Southwest Region of Missouri" (2022). *Health Policy and Management Issue Briefs*. https://hsrc.himmelfarb.gwu.edu/sphhs_policy_missouri/

3 Levi, J., Regenstein, M., Hughes, D., Trott, J., Markus, A., Seyoum, S., Acosta, A., Benoit, M., Van Bronkhorst, H., Conway, C. "Missouri's Public Health Response to COVID-19: Key Findings and Recommendations for State Action and Investment". (September 2021). *Health Policy and Management Issue Briefs*. Paper 61. https://hsrc.himmelfarb.gwu.edu/sphhs_policy_briefs/61

KEY FINDINGS: ST. LOUIS REGION OF MISSOURI'S PUBLIC HEALTH RESPONSE TO COVID-19

Key Finding		Summary
A	Years of Emergency Response and Preparedness Experience Were an Asset in the Early Response of the Pandemic	Though COVID-19 descended first in Missouri in the greater St. Louis area, LPHAs had been planning weeks before its arrival, mobilizing emergency response staff in their agencies and other employees who were cross-trained to work as emergency responders. For some LPHAs and health care organizations, prior experience with public health emergencies, including H1N1 and flu outbreaks helped to facilitate pandemic response efforts. Nevertheless, stakeholders across sectors did not feel prepared for the magnitude and scope of the pandemic, and LPHAs found their substantial planning efforts to be insufficient in the face of years of underinvestment in public health infrastructure by the state. Stakeholders and residents felt that the region would have benefited from more coordinated leadership from the state.
B	LPHA Staffing and Resource Constraints Profoundly Limited the Response	Even with experienced leadership and staff, LPHAs were not equipped with sufficient resources, capacity, and modernized technology to address the formidable challenges presented by the pandemic. LPHAs had trouble keeping up with the needs of their communities and were overwhelmed with pandemic-related activities such as contact tracing. CARES Act dollars created opportunities to staff up for these activities, but came too late for some LPHAs and did not strengthen overall public health capacity.
C	Community Partnerships Enhanced the Pandemic Response, But Revealed Substantial Limits in Public Health Capacity	The arrival of COVID-19 sparked an unprecedented level of collaboration and partnership that stakeholders described as rare for sectors in the St. Louis region. The four LPHAs communicated frequently as they navigated stages of the pandemic, despite political differences and different mitigation approaches across the region. Deficiencies in LPHA capacity and infrastructure led to the creation of the St. Louis Metropolitan Pandemic Task Force, a unique partnership among the four major health systems. Federally qualified health centers also assumed a larger role in public health activities and served as major service points for testing and vaccinations for their communities. New partnerships (the Regional Response Team and PrepareSTL) were formed to address social and economic needs of local residents. LPHAs were involved in multiple cross-sector partnerships, but were not viewed by stakeholders as having the capacity to lead the regional response. Stakeholders and residents appreciated the strong leadership and clear messaging from Task Force Incident Commander Dr. Alex Garza, but underscored the need for broader representation on the Task Force, especially from people and organizations with experience working with Black and Brown communities.

D	Poor Coordination Between the State and Local Levels Weakened the Region's Response	The state's home-rule approach led to poor coordination across jurisdictions and disagreements over which entity had the final authority to make and enforce pandemic policy. Policies around school reopening, quarantines, business closures, and masking were highlighted by stakeholders and residents as examples that varied from county to county, which added to the overall confusion and a patchwork response. They also noted that a poorly coordinated response was not wise given the nature of an airborne disease. Stakeholders and residents considered the vaccine rollout to be inequitable, with rural areas getting a disproportionate share before the more populated St. Louis region. North St. Louis was considered by several stakeholders to be a vaccine desert. Black focus group participants were frustrated with vaccine distribution, which appeared to indicate a lack of concern from the government about disproportionate impacts of COVID-19 on Black residents.
E	Inconsistent Data Reporting and Outdated IT Systems Stymied a Timely and Targeted Response	LPHA and state data systems were not aligned or up-to-date. Systems of varying sophistication were used locally to track cases, testing, and vaccines. Discrepancies in state and local data, driven by inconsistent reporting methods and systems, and delays, undermined trust in the data among some residents. New case tracking and vaccine registration systems were introduced by the state late. Data reporting by race and ethnicity in the region identified disparities in outcomes and enabled targeted pandemic services, such as testing, to be detected early on. However, some stakeholders felt that the collection and use of data by race and ethnicity could have been more consistent and better utilized for response purposes, including to target vaccination outreach.
F	Trusted Information Sources Enhanced Communication Efforts But Contended with Misinformation and Inconsistent Messaging	Significant efforts were made to tailor and target public health messaging to communities in the St. Louis region. In spite of the various strategies employed by public health, health care, and community-based organizations to convey accurate and up-to-date information, inconsistent guidance and misinformation confused residents and undermined public health strategies. A majority of focus group residents trusted their public health departments and medical experts in the community, yet several residents outside of St. Louis City and County felt that their leaders did not have as strong messaging as the Task Force. Many stakeholders noted a need for direct interaction with the community via trusted messengers, particularly among individuals who experienced mistrust or were difficult to reach with traditional modes of communication.
G	Racial Inequities Were Not Effectively Anticipated and Addressed by the Local and State Response, with Tragic Consequences	Following a familiar pattern in the St. Louis region, COVID-19 disproportionately impacted Black and Brown communities, who were subject to greater health and economic consequences, and inequitable access to testing and vaccines. The considerable expertise across sectors within St. Louis City and County was not adequately leveraged to create equitable action strategies. Missed opportunities to build the infrastructure for equity, including investing in data analysis by race/ethnicity and building upon trusted communication channels within the community, perpetuated predictable outcomes and mistrust in health care and government agencies. A number of focus group residents reported that community- and faith-based organizations were filling the void, reaching out to the most vulnerable and needy residents in the region, including Black, Brown, immigrant and non-English-speaking groups. Focus group participants identifying as racial or ethnic minorities noted the high cost and limited availability of tests in their neighborhoods. Many Black residents experienced racism and discrimination within the context of the pandemic. The pandemic exacerbated language and cultural barriers that hindered access to pandemic-related services, like vaccines, for people with limited English proficiency.
H	The Public Health Response Did Not Sufficiently Meet the Needs of People Living in Poverty	The pandemic created employment instability and eroded the ability to access food, housing, and transportation. Without these basic services, people living in poverty and in under-resourced communities faced greater difficulty accessing essential public health services like testing, vaccines, and PPE. Barriers caused by a lack of internet access and other technology affected access to vaccine appointments, testing and health services. While LPHAs, community organizations, and other sectors tried to address challenges related to accessing essential services, their efforts fell short of addressing the root causes of these issues.

Study Approach and Methods

In summer 2020, Missouri Foundation for Health contracted with The George Washington University Milken Institute School of Public Health to assess Missouri's public health preparedness and response capacities to the COVID-19 pandemic and future public health crises. The purpose of the regional case studies is to 1) document the multi-level and multi-stakeholder efforts to combat COVID-19, and 2) identify lessons from the pandemic that could strengthen public health practices to better safeguard communities in the future.

In the St. Louis region, which is designated Region C[4] by Missouri Department of Health and Senior Services (DHSS) (Figure 2), we spoke candidly with 40 professional stakeholders in various counties and towns (see the types of stakeholders we interviewed in Appendix A, Table A). Our sample included stakeholders within and outside the field of public health, including schools, health care, the business community, faith-based groups, policymakers, and social service organizations. Our interviews began in October 2020 and concluded in May 2021, prior to the surge caused by the delta variant. We promised confidentiality and anonymity to study participants to encourage candor when recounting their perspectives and professional experiences. *We refer to this group throughout the report as stakeholders.*

We also conducted 11 focus groups and four one-on-one interviews with people living in the St. Louis region to examine perceptions of the public health response. *We refer to this group throughout the report as residents or focus group participants.* We spoke with a total of 50 participants during spring 2021. To delve into how the pandemic uniquely impacted people of color, we held four groups with Black residents (a total of 28 participants). Table B in Appendix A provides information on the characteristics of the focus group participants. *One limitation of our study is that our sample of residents consisted of individuals who were well-informed about and interested in discussing the St. Louis region's response to COVID-19. They were also generally supportive of public health's role in helping to stop the spread of the virus.* As such, they provided thoughtful and reasoned input on the public health response in Missouri; however, we acknowledge that our sample does not represent large groups of residents who favored a limited role for public health and other government organizations with respect to the COVID-19 response.

Our interviews with stakeholders and focus group discussions with residents were supplemented by media accounts and other publicly available data sources. For more information on the study methodology see Appendix A.

4 Missouri Department of Health and Senior Services divides its health reporting regions according to the Missouri State Highway Patrol map. To view the regional map, see https://health.mo.gov/data/gis/pdf/map_ReportingRegions.pdf.

How the COVID-19 Pandemic Unfolded in the St. Louis Region of Missouri

March 2020–May 2021

> "There was a really large community-wide shigella outbreak in a lot of daycares… My understanding was that [that outbreak] was an all-hands-on-deck situation. But looking back on it, the people who worked on that have said, 'My goodness, we thought that was an all-hands-on-deck?"
>
> – PUBLIC HEALTH STAKEHOLDER

As context to understanding the COVID-19 response in the St. Louis region of Missouri, it is important to first paint a picture of how the virus impacted the region and its residents over the time of the case study, March 2020 through May 2021.

Missouri's first case of COVID-19 occurred in St. Louis County on March 7, 2020.[5] Knowing that more cases were certain to follow, the St. Louis region had to react decisively (Figure 2). LPHAs, hospital systems, health care providers, community organizations, and other sectors activated new partnerships and opened lines of communication across existing collaborations to control the spread of the virus, protect residents, and provide services and resources to their communities.

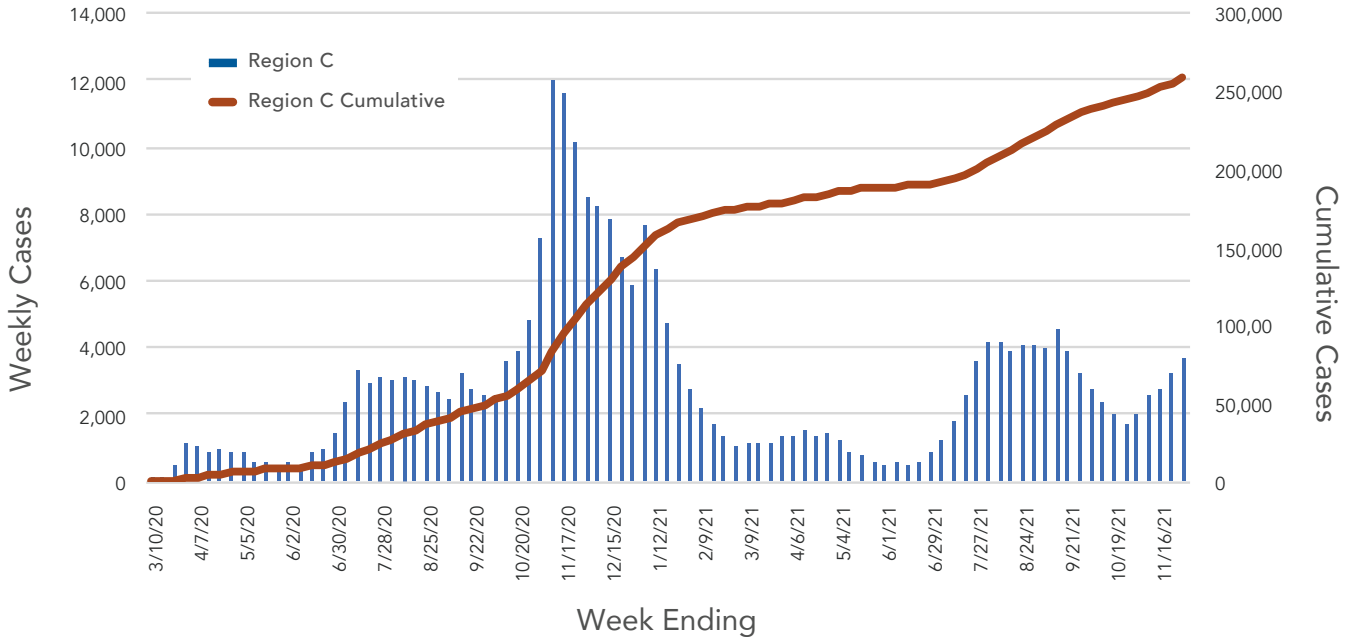
Local authorities in St. Louis City, St. Louis County, and St. Charles County quickly implemented restrictions on indoor gatherings and closed schools and businesses in March 2020[6] and Jefferson County implemented restrictions in late April 2020.[7] Within a matter of weeks, COVID-19 cases were recorded in all four jurisdictions

5 Missouri Governor Michael L. Parson. Governor Parson, state, and local officials confirm first case of COVID-19 to test "presumptive positive" in Missouri. (2020, March 7). https://governor.mo.gov/press-releases/archive/governor-parson-state-and-local-officials-confirm-first-case-covid-19-test

6 City of St. Louis Department of Health. (2020, March 15). Joint statement on COVID-19 from five regional leaders of bi-state government. https://www.stlouis-mo.gov/government/departments/health/news/joint-statement-regional-leaders-covid-19.cfm

7 Jefferson County Health Center. Board of Trustees Order Number 20-04-28-01. (2020, April 28). https://www.jeffcomo.org/DocumentCenter/View/10068/20-0307-COVID-19-Joint-Reopen-Order?bidId=

FIGURE 1. WEEKLY AND CUMULATIVE COVID-19 CASES FOR ST. LOUIS MISSOURI, MARCH 2020 – NOVEMBER 2021



This graph represents weekly and cumulative PCR confirmed COVID-19 cases for all counties and St. Louis City in Highway Patrol Region C. The four areas profiled in this report (City of St. Louis, Jefferson County, St. Charles County, and St. Louis County) make up 85% of Region C's total population.
SOURCE: Missouri Hospital Association analysis of MO DHSS EpiTrax data, Mar. 10, 2020 – Nov. 30, 2021.

with the number of cases growing to over 1,000 within the first month of the pandemic. The region's health systems readied their facilities and staff for high numbers of COVID-19 inpatients, and several hospitals opened testing sites across the region.[8] As the number of hospitalizations and deaths grew,[9] St. Louis County constructed a makeshift morgue to prepare for the worst.[10]

From the moment the pandemic reached the region, people of color experienced higher case numbers, hospitalizations, and deaths relative to their share of the population. The Missouri Hospital Association (MHA) issued a report in April 2020 about COVID-19's disproportionate impact on Black residents in the region. ZIP codes with majority Black residents experienced COVID-19 case rates twice as high as ZIP codes with majority White residents.[11] Early deaths were almost exclusively

8 SLM Staff. (2020, March 17). SSM Health to open five coronavirus testing sites across the St. Louis region. *St. Louis Magazine.* https://www.stlmag.com/health/news/testing-sites-coronavirus-ssm-health-st-louis-covid-19/

9 Clancy, S. (2020, March 30). A timeline of coronavirus in Missouri. *KSDK.* https://www.ksdk.com/article/news/health/coronavirus/coronavirus-timeline-missouri/63-98439849-3152-4f54-80d0-43fe6f50f01e

10 Kohler, J. & Cohen, R. (2020, April 14). St. Louis County builds temporary morgue to house bodies of COVID-19 victims. *St. Louis Post-Dispatch.* https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/st-louis-county-builds-temporary-morgue-to-house-bodies-of-covid-19-victims/article_4975767c-504b-59fa-aac8-bf3d97b180a2.html

11 Reidhead, M., Johnson-Javois, B., Brown, A., Brinkmann, J., Joynt Maddox, K.E., McBride, T., Porth, L., Long, P., McDowell, V., Stoermer, A., Schmidt, S., Echols, F., Purnell, J., Ross, W. (2020). The Disproportionate Impact of COVID-19 on Black and African American Communities in the St. Louis Region. Available at https://bit.ly/COVID19_STL

concentrated among Black people, and early cases were much higher among Black children compared to White children.[12] The St. Louis area has been described as an "epicenter of civil rights," after protests followed the 2014 killing of Michael Brown, a Black teenager, by a White police officer in Ferguson, Missouri.[13] The dual epidemics of systemic racism and COVID-19 contributed to the inequities in health outcomes documented throughout the pandemic in the St. Louis region.

With high rates of cases, hospitalizations, and deaths in the spring, officials in St. Louis County and the City of St. Louis were concerned that relaxing safety measures would put the public at further risk. In May 2020, days before Governor Parson's statewide stay-at-home order was lifted,[14] the City and County implemented local stay-at-home orders that were more restrictive than the State's reopening plan.[15] Attempts to slow the transmission and community spread of COVID-19 led St. Louis City and County to implement a mask mandate in early July of 2020.[16] Citing enforcement challenges, St. Charles County did not require residents to wear masks, but instead encouraged businesses to make masks mandatory for patrons.[17] Jefferson County implemented an emergency order that required masks to be worn where social distancing could not be maintained, but that order was later overturned.[18] By late summer, cases surged to new peaks in all four areas. St. Louis County broke its record for most single-day case increases three days in a row.[19] This led the St. Louis County and City to implement new restrictions, including setting limitations on building capacity, curfews for bars, and requiring quarantine plans for teachers.[20]

As these new restrictions went into effect, the region's schools were preparing for a new academic year. Teachers and concerned residents protested school reopening plans as several school districts announced plans to return to in-person operations, while others would conduct classes fully online or offer hybrid instruction.[21]

12 Rivas, R. (2020, May 27). COVID-19 hitting area black children, youth harder than whites. *The St. Louis American.* http://www.stlamerican.com/news/local_news/covid-19-hitting-area-black-children-youth-harder-than-whites/article_10f83e-be-a045-11ea-a65d-bb555165bc8a.html

13 The New York Times Staff. (2015, August 10). What happened in Ferguson? *The New York Times.* https://www.nytimes.com/interactive/2014/08/13/us/ferguson-missouri-town-under-siege-after-police-shooting.html

14 Missouri Governor Michael L. Parson. Extension stay at home order COVID-19. (2020, April 16). https://governor.mo.gov/press-releases/archive/governor-parson-extends-statewide-stay-home-missouri-order-through-may-3

15 The City of St. Louis. (2020, April 30). City of St. Louis remains under stay at home order beyond May 4th Missouri statewide reopening. https://www.stlouis-mo.gov/government/departments/health/news/city-remains-stay-at-home-order-beyond-state-missouri-reopening.cfm

16 The City of St. Louis. St. Louis County, City mandatory mask requirement to slow spread of COVID-19. (2020, July 1). https://www.stlouis-mo.gov/government/departments/mayor/news/city-and-county-require-mandatory-masks.cfm

17 Cole, A. (2020, July 27). St. Charles County leaders plea to local businesses: require masks. *KSDK.* https://www.ksdk.com/article/news/health/coronavirus/st-charles-county-leaders-plea-to-local-businesses-require-masks/63-01269d4a-a95e-48b9-aae0-4f83cee5a9ff

18 Jefferson County Health Center. Board of Trustees Order Number 20-08-27-01. (2020, August 27). https://static1.squarespace.com/static/57f035cc9f745646c52342b9/t/5f494e456c4b253182f16243/1598639686994/Board+of+Trustees+Order+Number+20-08-27-01.pdf

19 Olmos, D. (2020, July 24). St. Louis County reports record number of new COVID-19 cases for 3rd day in a row. *KSDK.* https://www.ksdk.com/article/news/health/coronavirus/coronavirus-numbers/st-louis-county-coronavirus-record-numbers-cases-trends/63-98265655-db3a-4c15-afd7-dac82ceab7d1

20 City of St. Louis. Health Commissioner's Order No. 15. (2020, November 12). https://www.stlouis-mo.gov/government/departments/health/communicable-disease/covid-19/orders/health-commissioner-order-15.cfm

21 Bernhard, B. (2020, July 20). School reopening plans across St. Louis area vary from all in-person to all online. *St. Louis Post-Dispatch.* https://www.stltoday.com/news/local/education/school-reopening-plans-across-st-louis-area-vary-from-all-in-person-to-all-online/article_b5d61576-8094-5dde-92b7-a5221c838a5b.html

St. Louis County's and the City of St. Louis's health departments would, among other measures, require masks to be worn in schools.[22,23] As people returned to work and school and continued moving between the four areas, the virus spread rapidly throughout the region.

Fall and winter 2020 were particularly challenging for LPHAs as cases, hospitalizations, and deaths reached all-time highs. Hospitals were at or near capacity, and leaders in the area called for state-wide measures to slow the virus's spread.[24] The region was averaging about 3,000 new weekly cases and hundreds of COVID-19 hospitalizations.[25] St. Louis City tightened restrictions, citing a continued surge of cases, with several hospitals reaching 90% capacity.[26] As a result of high case rates, Jefferson County implemented a mask mandate to control community transmission.[27]

Vaccines arrived in Missouri in December 2020, with initial limited supplies directed to major hospital systems for distribution. The state's vaccine allocation plans, which were reportedly based on regional population numbers, left the Greater St. Louis area with less supply than expected.[28]

Rural areas of the state received proportionally larger vaccine shipments, resulting in surpluses that drew some people from the St. Louis area.[29] Vaccine "deserts" emerged in northern St. Louis neighborhoods, where most residents are Black and many have underlying health conditions.[30]

As the state made vaccines more widely available and vaccination sites increased, COVID-19 case numbers began decreasing in the spring of 2021. Just as LPHAs were beginning to breathe a sigh of relief, the delta variant of COVID-19 was detected in rural Missouri, and quickly made its way to St. Louis. Delta's high transmission rate put unvaccinated people at particular risk.

Since our study ended, the St. Louis region continues to fight the virus, including facing the emergence of the omicron variant. The past two years have left many in the public health field feeling defeated; however, this study comes at an opportune time to address the long-standing problems and weaknesses that were made so apparent by COVID-19, and to learn from and invest in the successes of the region's pandemic response.

22 City of St. Louis Department of Health. Guidance for reentry to City of St. Louis school systems. (July 2020). https://www.stlouis-mo.gov/government/departments/health/communicable-disease/covid-19/guidance/phase-one/return-to-school.cfm

23 St. Louis County. Return to school guidance. (2020, July 1). https://go.lindberghschools.ws/cms/lib/MO01920486/Centricity/Domain/4/St.%20Louis%20County%20Return%20to%20School%20Guidance.pdf

24 Martinez, M. (2020, November 13). 'We are danger-close': With St. Louis area hospitals near capacity, task force calls on statewide measures to slow spread of virus. *KSDK*. https://www.ksdk.com/article/news/health/coronavirus/covid19-st-louis-task-force-update/63-c26d65cd-d3a5-4a4d-91e2-8b80ddbdb2b0

25 Martinez, M. (2020, November 17). St. Louis area sets record for hospitalizations, Missouri reports more than 5,000 new COVID-19 cases. *KSDK*. https://www.ksdk.com/article/news/health/coronavirus/coronavirus-numbers/missouri-st-louis-covid19/63-de1197eb-437f-4b72-ab4a-ab8fc49c7ba8

26 City of St. Louis Health Commissioner's Order No. 15. (2020, November 12). https://www.stlouis-mo.gov/government/departments/health/communicable-disease/covid-19/orders/health-commissioner-order-15.cfm

27 City of Jefferson County Executive Order No. 20-109. (2020, November 25). https://www.jeffcomo.org/DocumentCenter/View/10927/20-109-Mask-Order?bidId=

28 Munz, M. (2021, February 10). State's vaccine distribution shortchanges St. Louis region, local officials insist. *St. Louis Post-Dispatch*. https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/state-s-vaccine-distribution-shortchanges-st-louis-region-local-officials-insist/article_3b2b5859-8ef2-5518-8e61-4e59ab84a4f4.html

29 Gray, B. & Merrilees, A. (2021, March 7). Rural vaccine surpluses around Missouri spark frustration and questions. *St. Louis Post-Dispatch*. https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/rural-vaccine-surpluses-around-missouri-spark-frustration-and-questions/article_96c76d86-ccfc-53b9-898a-5ceba944749a.html

30 Weinberg, T. (2021, February 4). Missouri data shows expanding 'vaccine deserts' in St. Louis and Kansas City metros. *Missouri Independent*. https://missouriindependent.com/2021/02/04/missouri-data-shows-expanding-vaccine-deserts-in-st-louis-and-kansas-city-metros/

I. Public Health Infrastructure in the St. Louis Region of Missouri

A Highly Populated Urban Hub

Missouri's public health system represents a decentralized approach that relies on local decision-making. In this report, we focus on four LPHAs in the Greater St. Louis region: those in the City of St. Louis, Jefferson County, St. Charles County, and St. Louis County. These four areas are situated in Region C of the DHSS health reporting regions (see Figure 2).[31] Together, these four LPHAs provide public health services for one-third of Missouri's population.

St. Louis County has one of the highest national rates of workers commuting from outside the County; in 2013, more than 70,000 St. Charles County residents, 45,000 Jefferson County residents, and 53,000 City dwellers worked in St. Louis County, and nearly 140,000 residents in St. Louis County worked in these other jurisdictions.[32] Additional movement across the region is associated with business activity that caters to residents metro-wide.

The region is home to some of the state's largest employers including BJC Healthcare, SSM Health, Boeing International Defense Systems, Walmart stores, Scott Air Force Base, and Washington University in St. Louis.[33] Large, sophisticated hospital systems, research centers, and universities make it a hub for health care with a wide bench of scientific and technical expertise.

As a whole, the St. Louis region is more racially diverse than the rest of the state, though population characteristics vary substantially across the four jurisdictions. Jefferson County is the least diverse among the four areas, with about 94% of residents identifying as White and 6% identifying as racial and ethnic minorities. In St. Charles County, racial and ethnic minorities make up about 13% of residents, while White people account for 87% (see Appendix A, Table C).

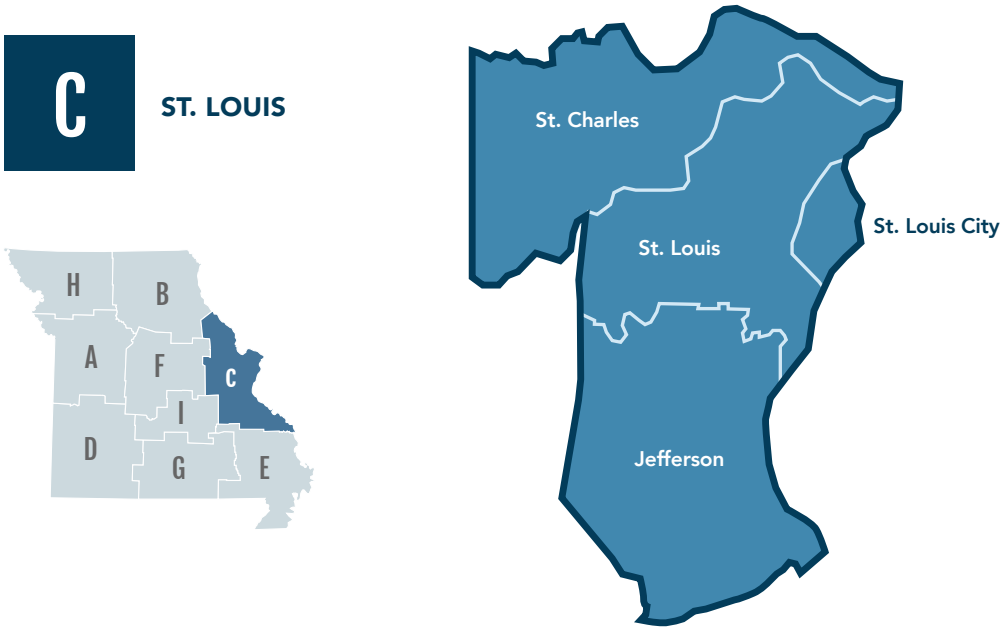
St. Louis City is the most diverse. Black people account for 46.4% of the population, White people make up 43.6% of City residents, and American Indian/Alaskan Natives, Asian or Pacific Islanders and multi-racial groups make up about 7% of the population. About 3% of City residents identify as Hispanic/Latino (see Appendix A, Table C). The Black population represents about 25% of St. Louis County residents and White

31 Missouri Department of Health and Senior Services divides its health reporting regions according to the Missouri State Highway Patrol map. To view the regional map, see https://health.mo.gov/data/gis/pdf/map_ReportingRegions.pdf

32 United States Census Bureau. (2013, March 5). Census Bureau reports 236,000 workers commute into St. Louis County, MO., each day. https://www.census.gov/newsroom/archives/2013-pr/cb13-r24.html

33 Missouri Economic Research and Information Center. Missouri's top 50 employers. (2019). https://meric.mo.gov/industry-research/top-50-employers

FIGURE 2. MAP OF MISSOURI DHSS HEALTH REPORTING REGIONS: ST. LOUIS MISSOURI (REGION C)



Note: City of St. Louis, Jefferson County, St. Charles County and St. Louis County are part of Health Reporting Region C.
SOURCE: Missouri Department of Health and Senior Services. Health Reporting Regions. (n.d.) health.mo.gov/data/gis/pdf/map_ReportingRegions.pdf.

residents constitute about two-thirds of people living in the County (see Appendix A, Table C).

Discriminatory policies in St. Louis, particularly certain historic policies related to housing, have created highly segregated neighborhoods.[34] Most residents in the northern neighborhoods of St. Louis City are Black or other racial/ethnic minorities, whereas most residents in the city's southern neighborhoods extending into St. Louis County are White.[35,36] This racial segregation is known locally as "the Delmar Divide," in reference to Delmar Avenue, where the racial characteristics of residents north and south of the street differ substantially. According to a 2015 demographic analysis of St. Louis, 97% of residents who live "north of Delmar" are non-White versus 38% "south of Delmar." Household income and median property values are substantially lower in North City.[37]

34 The City of St. Louis. Residential Segregation: The percentage of residents that live in racially segregated census tracts in the City of St. Louis. https://www.stlouis-mo.gov/government/departments/mayor/initiatives/resilience/equity/justice/civic-engagement/residential-segregation.cfm

35 For the sake of all: A report on the health and well-being of African Americans in St. Louis and why it matters for everyone. Washington University in St. Louis and Saint Louis University. (2015). https://cpb-us-w2.wpmucdn.com/sites.wustl.edu/dist/3/1454/files/2018/06/FSOA_report_2-17zd1xm.pdf

36 Cambria N, Fehler P, Purnell JQ, Schmidt B. Segregation in St. Louis: dismantling the divide. St Louis, MO: Washington University in St. Louis. (2018). https://healthequityworks.wustl.edu/items/segregation-in-st-louis-dismantling-the-divide

37 Tighe, JR, Ganning, JP. (2015). The divergent city: unequal and uneven development in St. Louis. *Urban Geographic,* 36:5, 654-673. DOI:10.1080/02723638.2015.1014673

Poverty is a critical issue in the St. Louis region where there are vast disparities in household income, wealth, and other economic factors. St. Charles County has the lowest poverty rate (4.6%) and, along with St. Louis County, is ranked among the wealthiest Missouri counties in terms of median family income.[38] The highest rates of poverty in the region are in St. Louis City, where 21.8% of households are classified as living in poverty. This rate is nearly twice the state average of 12.9%. The St. Louis Federal Reserve Bank found that "historical barriers" like redlining and housing discrimination continue to limit Black and Hispanic people's ability to accumulate wealth.[39] Black residents in St. Louis were three times more likely to live in areas where over 40% of people live in poverty.[40] LPHAs work to mitigate poverty's health impacts through a variety of programs related to healthy food and nutrition, chronic disease management, maternal and child health, injury prevention, opioid and other substance use interventions, and many other initiatives.

LPHA Accreditation, Governance, and Financing

The St. Louis City and County Public Health Departments are two of only seven LPHAs in Missouri that are accredited by the Public Health Accreditation Board (PHAB), a national voluntary organization that sets standards for tribal, state, local and territorial public health agencies.[41] LPHAs often cite cost and the demands on their already limited resources as major barriers to seeking and achieving accreditation. Jefferson County's LPHA is accredited by the Missouri Institute for Community Health (MICH), the accrediting body for Missouri's Voluntary Accreditation Program for LPHAs (see Appendix A, Table C).[42]

Missouri's decentralized approach allows for variations in governance structures that have implications for public health decision-making and financing.[43] Jefferson County's public health department is governed by an elected Board of Health that acts separately from the county government to set public health priorities, orders, and regulations.[44] The St. Charles County and the St. Louis County departments of public health are parts of county government and consequently report to their county executives, whose decisions may require review or approval by county councils. The public health department in St. Louis City is also part of local government, with the city LPHA reporting to the mayor and a Board of Aldermen serving as the city's legislative body. A joint Board of Health and Hospitals serves in an advisory capacity to the St. Louis City health director in matters related to public health.[45]

The St. Louis region's LPHAs have experienced chronic underfunding and under-resourcing, which affect their capacity to serve their communities, despite relatively large budgets compared to less-populated regions in the state. Mirroring the wealth divide between St. Louis City and other more resourced communities in the region, the City of St. Louis's health department has

38 Data USA. St. Charles County, MO. (2020). https://datausa.io/profile/geo/st-charles-county-mo#economy

39 Hernandez Kent, A. & Ricketts, L. (2021, January 5). Wealth gaps between White, Black and Hispanic families in 2019. *The Federal Reserve Bank of St. Louis.* https://www.stlouisfed.org/on-the-economy/2021/january/wealth-gaps-white-black-hispanic-families-2019

40 The City of St. Louis. Concentrated poverty. https://www.stlouis-mo.gov/government/departments/mayor/initiatives/resilience/equity/opportunity/neighborhoods/concentrated-poverty.cfm

41 Public Health Accreditation Board. Why become accredited? https://phaboard.org/why-become-accredited/

42 Missouri Institute for Community Health. Accreditation introduction. https://michweb.org/accreditation-introduction/

43 Decentralized local public health governance indicates that local government employees lead local health departments and local governments have autonomy over fiscal decisions. See, https://www.astho.org/Research/Data-and-Analysis/State-and-Local-Governance-Classification-Tree/.

44 Jefferson County, Missouri. Home rule charter of Jefferson County, Missouri. https://ecode360.com/27895367

45 The City of St. Louis. Joint boards of health and hospitals. https://www.stlouis-mo.gov/government/departments/health/board/index.cfm

been particularly affected by budget cuts and lack of investment over the past decades.[46]

Core support from the state for LPHAs in the St. Louis region is negligible. Excluding pass through federal dollars to run public health programs for chronic disease, maternal and child health, and injury prevention, state support ranged from 1.8% in St. Louis County to 8.5% in St. Charles County.[47] For all four LPHAs, local taxes represented over half of their total revenue (pre-COVID).

During the pandemic, the four LPHAs in the region relied on external funding to meet their needs. CARES Act funds were distributed to counties in May 2020.[48] The City of St. Louis, Jefferson County, St. Charles County, and St. Louis County all received CARES Act funding, which was used to increase staffing and, in some cases, to purchase contracted services. Even with substantial CARES Act relief, LPHAs were stretched thin and struggled to maintain their traditional public health services.

46 Missouri Budget Project. The health of Missouri is at stake. (2016, January 16). https://www.mobudget.org/the-health-of-missouri-is-at-stake/

47 In The City of St. Louis and Jefferson County, state support for LPHA programs was 2.8% and 5.7%, respectively. For more information on LPHA revenue sources, see https://health.mo.gov/living/lpha/review18/Table_Contents.php.

48 Missouri State Treasurer. Treasurer Fitzpatrick announces first CARES Act payments to local governments processed. (2020, May 4). https://treasurer.mo.gov/newsroom/news-and-events-item?pr=d1bd7058-eca5-40b3-af74-cae92d8d0da8

II. Strengths and Challenges in the St. Louis Region of Missouri's Public Health Response to COVID-19

The following sections present key findings related to strengths and challenges experienced by professionals from multiple sectors involved in the pandemic response, as well as residents' perceptions of the pandemic response.

A. Years of Emergency Response and Preparedness Experience Were an Asset in the Early Phase of the Pandemic

> "I think this emergency opened up a lot of weaknesses in [emergency preparedness] ... there were a lot of plans that the department wasn't remotely prepared to implement."
>
> — LOCAL PUBLIC HEALTH STAKEHOLDER

When COVID-19 descended on the greater St. Louis area in March 2020, the region was relatively well prepared. A stakeholder in the education sector recalled, *"There's a vivid memory of going, 'Oh my gosh, we've got to pull out that pandemic plan' because I know it was in the file drawer."*

LPHAs in the region had begun preparing weeks before the virus reached Missouri. In mid-January 2020, the St. Louis City public health department met with the fire department, Emergency Medical Services, City Emergency Management Agency, state emergency personnel, and officials at Lambert International Airport to discuss how the pandemic would impact the city. As a local public health stakeholder explained, those early meetings provided an opportunity to *"identify any gaps in communication as well as protocols,"* and to develop accurate distribution lists to ensure that the appropriate individuals at each agency would be notified about potential cases of COVID-19 in a timely manner.

The Jefferson County Health Department's emergency response team also looked to other states to see how they were handling their cases and worked with their administration to *"prepare those planned what-ifs."* There was also careful coordination with department epidemiologists and communicable disease nurses to create efficiencies in the early days of the pandemic. According to one local public health stakeholder: *"They're doing the [disease tracking] and watching for those illnesses ahead of time and were able to help work with the*

hospital systems and the community to start putting those prevention steps in place."

When the virus finally reached the region, LPHAs were equipped with emergency response plans, dedicated staff, and community- and state-level networks. Several health departments utilized an Incident Command System (ICS) and started cross-training staff to work as emergency responders. Two of the four LPHA directors in the region previously held positions as leaders of emergency preparedness and response teams.

Health systems also identified staff with emergency-response expertise to establish hospital-based emergency operations centers in the first few weeks of the pandemic. According to a health care stakeholder, *"Someone said, 'We should get together and we should start to figure out how we're going to manage beds, how we're going to manage ventilators. Make sure we know what our capacity is. Start talking with city and county and state government officials or people like the Public Health Department to begin to plan how we're going to deal with this.'"*

Some public health and health care stakeholders described previous experience and training focused on natural disasters and public health crises, such as flu and Ebola, as helpful when responding to the COVID-19 pandemic. Personal protective equipment (PPE) and other supplies had been stockpiled by at least one LPHA and one hospital in the region during the H1N1 and Ebola responses. Other health care organizations scrambled to find adequate supplies of PPE, with one representative of a long-term facility commenting: *"PPE was extremely challenging. I probably have lost years of my life, honestly, just [from] worrying about PPE in the early days."*

Limitations of Emergency Preparedness and Planning

Stakeholders said that, even with years of expertise and careful planning, the four LPHAs found their emergency preparedness capacity to be insufficient to address the magnitude of the pandemic. One public health stakeholder reported that while their public health department had plenty of *"excellent and technically correct preparedness plans,"* staff had more experience activating natural disaster or bioterrorism plans, rather than a plan appropriate for the pandemic. At the state level, emergency planning had long prioritized natural disasters over infectious disease outbreaks, hampering the speed with which officials could respond to the unfolding pandemic. One public health stakeholder highlighted these shortcomings for the current situation: *"The thing that we've been doing the most with the state has been preparing for the earthquake on the New Madrid Fault… And our level of preparedness for that [was] very different than what our preparedness for a pandemic looked like."* Despite all their planning, some LPHAs felt ill-equipped to put these emergency plans into action.

"There's a vivid memory of going, 'Oh my gosh, we've got to pull out that pandemic plan' because I know it was in the file drawer."
– Local education stakeholder

On the whole, stakeholders from public health, health care, and the education sector did not feel that the region was prepared for the pandemic and pointed to a lack of coordinated leadership from the state as a major hindrance in the response. The State Emergency Management Agency, Community Organizations Active in Disaster, and Volunteer Organizations Active in Disaster were decentralized in their response to the pandemic, and were seen as being limited by an informal and ineffective structure during the pandemic.

Although focus group participants were generally appreciative of public health and health care leaders' efforts, some were surprised at how unprepared and disorganized the region was to deal with the pandemic. As one resident stated, *"I know that no one predicted this and know it was a damage-control-type thing. I wouldn't even expect anybody to be proactive with being able to prepare for this, but I just think it was just poorly executed.*

B. LPHA Staffing and Resource Constraints Profoundly Limited the Response

> "We're all operating with 200 people less than what we really need to do the job well, and no resources to do it. That's a lot of what we struggle with."
>
> — LOCAL PUBLIC HEALTH STAKEHOLDER

The St. Louis region's response benefited from having experienced staff and leadership at the helm of LPHAs. Together, each of the four LPHA directors had decades of practice in relatively large, "full-service" public health settings. One stakeholder commented, *"We were really fortunate that we actually had some top-tier, highly informed leaders in [local] public health."*

Despite expert leadership and staff, however, the public health departments in the St. Louis region were not equipped with sufficient resources or capacity. Some LPHAs were understaffed going into the pandemic and most said that they did not have modernized technology to manage immense disease tracking efforts. Stakeholders from public health, health care, the business community, nonprofit organizations, and education broadly agreed that longstanding underinvestment in public health infrastructure hamstrung LPHAs' ability to respond.

In March and April 2020, prior to the distribution of federal funding, LPHAs quickly reassigned staff to the pandemic response, in some cases shutting down all other services aside from the most-basic necessities. One local public health stakeholder lamented, *"[Local elected officials] handicapped us, because we didn't have the resources to do the essential public health functions and now we're in the middle of a pandemic and we have to not only reallocate our internal resources, but also figure out how to navigate this pandemic."*

CARES Act funding provided a huge financial boost to all four of the region's LPHA budgets and enabled the hiring of staff for pandemic response efforts. The four LPHAs in the St. Louis region, unlike smaller departments throughout the state, were well versed in how to manage multiple funding streams, and eventually were able to take advantage of opportunities to supplement their revenues. However, as one public health stakeholder put it, *"by the time we had some CARES Act funding, the [pandemic] was full blown and had bypassed the benefit of contact tracing."* Furthermore, for each of the LPHAs, new staffing was part of an emergency response to COVID-19 rather than an opportunity to modernize public health interventions or to shore up pre-existing deficiencies in infrastructure.

LPHAs had trouble keeping up with the needs of their communities at different stages of the pandemic. Public health departments lacked adequate data tracking systems and, as the volume of cases rose, existing

tracking systems and personnel assigned to contact tracing became overwhelmed. A public health stakeholder described how their public health department just *"couldn't do [contact tracing]"* prior to receiving CARES Act funding. Another public health stakeholder described turning their agency *"upside down,"* assigning almost every full-time staff member to contact tracing, and having to *"shut down all services aside from very basic necessities."* Summarizing the impact of LPHAs inability to contact trace, another public health stakeholder explained: *"If you can't keep up with the case investigations, you can't identify the contacts. So you can't get in front of the contacts and quarantine them before [they] infect other people."*

"By the time we had some CARES Act funding,the [pandemic] was full blown and had bypassed the benefit of contact tracing."

– Public health stakeholder

The impact of resource constraints on the provision of essential pandemic services was felt by a number of residents in the focus groups, who reported that capacity and staffing issues impeded consistent testing and the initial vaccine distribution. In St. Louis County, for example, several residents noted that the public health department had to rely on volunteers to help with staffing shortages. As one participant said, *"I think just at the beginning with the contact tracing, they just didn't have enough people helping out. That was a big deal … And then they looked for volunteers to help run mass-vaccine events … So I think it was just not knowing how many hands on deck you needed to execute a lot of this stuff."* Due to these resource constraints, residents noted other sectors, primarily health care organizations, stepped in to fill the gap left by public health.

C. Community Partnerships Enhanced the Pandemic Response, But Revealed Substantial Limits in Public Health Capacity

> "I was shocked at the level of collaboration we got, honestly, in the [St. Louis] metro region."
>
> — STAKEHOLDER IN NON-PROFIT ORGANIZATION

The St. Louis region saw unprecedented collaboration during the pandemic. Before the pandemic, LPHAs operated in ways that were *"pretty siloed,"* according to several stakeholders, many of whom described a *"fragmented"* metropolitan area where political disagreements have consequences for public health department collaboration.[49] Cross-sector collaboration pre-pandemic was limited, with one federally qualified health center (FQHC) stakeholder saying, *"Very rarely did we have much interaction with the city or the county department of health prior to COVID."* Another stakeholder added that coordination and collaboration across community organizations and social service providers *"doesn't always happen in the St. Louis region."* While many opportunities for collaboration existed before the pandemic, discussions did not always result in action. In the words of one stakeholder: *"So, yes, St. Louis, we do collaborate. We all sit in meetings together, and we just talk. Then when it comes down to getting stuff done, it's really hard to get us to work together."*

Improvements in collaboration during COVID-19 were noted by many stakeholders, with one health care stakeholder stating: *"I've seen [the public health departments] be a lot more open to figuring out how to work creatively with organizations as a result of COVID, more transparent about what their challenges are, more willing to work together."* Health systems that had long operated in a highly competitive environment forged stronger ties, with one stakeholder reporting that *"the level of collaboration among the major [four] health systems was really impressive."*

Hospital Systems and Health Centers Assume a Major Role

In early April 2020, the four largest health systems—BJC Healthcare, Mercy, SSM Health, and St. Luke's Hospital—created the St. Louis Metropolitan Pandemic Task Force ("the Task Force") to *"ensure collaboration and the best possible patient care and coordination of supplies, hospital beds and other critical assets."*[50] Public health departments, business partners, local elected officials, and infectious disease and data experts from Saint Louis University and Washington University in St. Louis were involved in many Task Force activities. The incident commander of the Task Force, Dr. Alex Garza,

49 Better Together, formed in 2013, was an initiative to merge the City of St. Louis and St. Louis County health departments and other public services, and eliminate the region's fragmentation. To read the Task Force Report, see https://www.claytonmo.gov/home/showdocument?id=4665. To learn more about Better Together, visit bettertogetherstl.com.

50 St. Luke's Hospital. St. Louis regional healthcare systems launch St. Louis Metropolitan Pandemic Task Force. (April 2020). https://www.stlukes-stl.com/St-Lukes-News/2020/St-Louis-Regional-Healthcare-Systems-Launch-St-Louis-Metropolitan-Pandemic-Task-Force/

was SSM Health's chief medical officer and a former U.S. Department of Homeland Security official who led the U.S. response to the H1N1 pandemic.[51] Nearly all stakeholders mentioned that the Task Force allowed regional leaders to *"speak with one voice"* and provide guidance to residents.

FQHCs in St. Louis City, St. Charles County, and Jefferson County were instrumental in providing testing services, prioritizing financially stressed communities and neighborhoods with large Black, Latino, and immigrant populations. FQHCs became part of the Task Force as data revealed the disproportionate impact COVID-19 was having on communities of color in the region. Much of the coordination between the FQHCs, the Task Force, and LPHAs was facilitated by the St. Louis Integrated Health Network, a cross-organizational intermediary that aims to improve quality of care and access for St. Louis residents, especially the medically underserved.[52]

Stakeholders across all sectors as well as focus group participants praised the work of the Task Force, whose fast-acting response was considered critical to preventing even larger numbers of deaths and illnesses. In the words of one resident, *"I think one of the best things that's happened during the pandemic for health care and public health is that there's a St. Louis Metropolitan Pandemic Task Force, and health care systems across St. Louis City, St. Louis County, St. Charles County, Jefferson County, have tried to come together to have one message. That message has been fact-based about the vaccine, about [COVID-19]."*

Several residents said they valued the evidence-based approach of the Task Force and felt it stayed above the political fray, making its recommendations and decisions more credible. As one resident explained, *"I think people are more likely to trust a health director than an elected official because you take the politics out of it… And when you're going straight to the source, it's the health director. That's the one that's the expert on this."* Some stakeholders, however, felt that the apolitical posture of the Task Force meant that LPHAs were left on their own to push for difficult policy decisions, such as mask mandates. As a result, LPHAs and elected officials were often in politically fraught positions related to mitigation efforts.

"I've seen [the public health departments] be a lot more open to figuring out how to work creatively with organizations as a result of COVID, more transparent about what their challenges are, more willing to work together."
– Local health care stakeholder

In spite of its important role in leading the response, many stakeholders pointed out shortcomings with the Task Force, including the need for its leadership to be more diverse. Several stakeholders questioned why the Task Force had not been embedded in the Regional Health Commission,[53] which had served as a collaborative table with broad representation for nearly two decades. A stakeholder in a community-based organization explained: *"A lot of what was missing is probably just having the leaders at the table that have experience working with Black and Brown communities as well as*

51 Langston, MC. Army Reserve medical officer leads St. Louis Metropolitan Pandemic Task Force. (2020, May 1). https://www.usar.army.mil/News/Article/2173045/army-reserve-medical-officer-leads-st-louis-metropolitan-pandemic-task-force/

52 The St. Louis Integrated Health Network, made up of health centers, medical schools, health departments, and large hospital systems, aims to eliminate health care disparities through collaborative partnerships that develop solutions to improve accessibility, affordability, and quality of care for vulnerable populations in the region. To learn more, visit https://stlouisihn.org/about/.

53 The St. Louis Regional Health Commission is a collaborative effort between the City of St. Louis, St. Louis County, the state of Missouri, and health care providers, and community members to improve the health of St. Louis's residents, insured and uninsured alike. To learn more, visit https://www.stlrhc.org/.

data that shows some of the disparities." Some stakeholders also pointed to the limitations of a hospital-led Task Force, especially given that other health care and community-based organizations have more direct links with certain communities. For example, stakeholders observed that the Task Force did not prioritize access to testing and vaccination beyond the hospital setting, and according to one public health stakeholder, the focus was on sharing hospital-based data: *"That was a lost opportunity to really talk about some of the larger issues with [COVID-19]… and to incorporate community-based data along with that hospital data."*

Focus on Social Services

The pandemic highlighted structural inequities in the Greater St. Louis region and exacerbated the social and economic needs of under-resourced communities. Two new community partnerships were created in the early weeks of the pandemic to address these needs.

The Regional Response Team (RRT) provided a centralized social services emergency response to help people whose lives were most severely disrupted by COVID-19. Operating in St. Louis City and County, St. Charles County, and two neighboring counties in Illinois, the RRT collaborated with social service providers, philanthropic agencies, and others in private and public sector groups to develop a targeted, real-time response to community needs. Among its priorities were helping families feed their children, leveraging support for rent and mortgage assistance to prevent evictions, and working with the St. Louis City and County public health departments and others to distribute PPE in the community.

Many stakeholders held up the RRT as an example of a partnership *"born out of necessity"* that created a mechanism to coordinate and collaborate with non-profit organizations and service providers, as well as LPHAs, on behalf of vulnerable residents, which *"doesn't always happen in the St. Louis region."* A stakeholder in a community-based organization noted that the RRT *"was very much attuned to the disproportionate impacts on the Black community and figuring out ways to address that."* Some stakeholders in the non-profit sector, however, were unclear about the long-term role of the RRT and how its work was differentiated from social service agencies operating in the RRT's service areas.

Another partnership created early in the pandemic, PrepareSTL, sought to create a trusted source of information for people at high risk of COVID-19, many of whom were apprehensive of mainstream communications channels when it came to the health of their families and communities. Some of PrepareSTL's early outreach focused on face masks, proper hygiene, social distancing, and other information, occasionally working with the public health departments to co-brand communications or collaborate on strategies for equitable vaccine distribution. In summer 2020, during the outpouring of grief over the murder of George Floyd, PrepareSTL's messaging expanded to address the consequences of battling a dual pandemic of racism and COVID-19.

The disparate impact of the pandemic on the region's most vulnerable populations was a critical concern identified by many in the focus groups. In all four focus groups with Black residents, participants talked about the disproportionate risk of the virus in their communities and the need for more and better services to address the devastating social and economic impacts. For example, one participant pointed out that Black residents with low incomes were especially vulnerable: *"I saw COVID just wreak havoc on every social determinant of health from housing number one to employment. I mean, literally everything like transportation, food, everything I felt like was affected by COVID. And even more specifically to Black and Brown people, especially in areas that are low-income because they don't have resources… We will see the effects of this for years and years to come, especially with the Black and Brown populations."*

The Role of LPHAs in the Midst of Multiple Regional Partnerships

Overall, the St. Louis region was awash in cross-sector partnerships, which stakeholders considered a strength to supplement limited public health resources throughout the pandemic. In the words of one community stakeholder, *"Our health departments were not necessarily positioned as the lead groups. We really went to*

"To be honest, it's the public health departments that seem to be the most strained and have the least collaborative capacity, especially because they're invited to show up at so many tables, but I don't see a table that's oriented to them. I think that's been something that has gotten in our way quite a bit over the last year."

– Local education stakeholder

people who had resources." Many residents saw local elected officials and the Task Force as the principal leaders in the pandemic response in charge of developing policy and guidance, respectively, and viewed public health agencies as serving in a supporting role. In fact, very few participants (15%) could identify their LPHA director by name, while many in the groups were able to identify their county executive and Dr. Garza as the Task Force lead.

Some residents praised LPHAs' connections with the community and their ability to leverage partnerships with community organizations to help provide essential pandemic services. As one participant described, *"[The public health department] partnered with community partners, whether it's qualified health centers or churches. They've partnered with them to make [vaccines] easily available … [and with] school districts, to get it to kids 12 and up who can get it. Yeah, they've really used community partners to get to those people … so I think that's a big part of it."* A few school representatives, however, found LPHAs to be difficult to work with, especially across jurisdictions. Some of the schools' frustrations stemmed from communications lags as well as the state's decision not to prioritize teachers, school nurses, and other staff for early vaccination. According to one education stakeholder, *"I was able to get our school nurses vaccinated, but it took, oh my gosh, so much work and so much anxiety … Our health department was totally unhelpful."*

Participating in multiple partnerships presented practical challenges for LPHAs, given their staffing limitations and obligations related to public health service to their communities. One stakeholder from the education sector explained: *"To be honest, it's the public health departments that seem to be the most strained and have the least collaborative capacity, especially because they're invited to show up at so many tables, but I don't see a table that's oriented to them. I think that's been something that has gotten in our way quite a bit over the last year."*

D. Poor Coordination Between the State and Local Levels Weakened the Region's Response

> "We ended up with such a patchwork of responses that it didn't make sense. It wasn't a cohesive plan in the state. This county did one thing, that county did another, and that made it hard too, because the residents of those two counties were complaining that the other county did it differently."
>
> — LOCAL PUBLIC HEALTH STAKEHOLDER

The state's home-rule approach to pandemic policy and the decentralized nature of public health drove a locally tailored response that was challenged by the scope, scale and novelty of the pandemic. The state strategy led to poor coordination across jurisdictions and school districts, as well as disagreement over which entity had the final authority to make and enforce pandemic policy. Policies around school reopening, quarantines, business closures, and masking were highlighted by stakeholders and residents as strategies that varied from county to county, which added to the overall confusion and a patchwork response. This tension came into particular relief in St. Louis County and City, when restrictions imposed by LPHAs and local elected officials became subject to state legal action.[54]

Several stakeholders pointed to school policies around quarantine and isolation as an example in which state and local authorities were at odds around the best path forward, particularly after Governor Parson loosened quarantine restrictions in November 2020 in the midst of a spike in cases. Some St. Louis area school districts chose to defy the state guidance, noting publicly that they did not agree with the state's approach. As one stakeholder in the education sector said, *"The LPHAs and the state are not on the same wavelength at all."*

The question of authority was also raised in a number of the focus groups, where participants had mixed reactions to the interplay between the state and local levels. Many felt the governor should have initially presented *"a unified message from the top"* that there would be *"no tolerance"* for not complying with local mandates. Others, however, felt the state's lawsuits and legislative actions helped stem concerns that local officials were overreaching their authority and making overly restrictive policies without going through the appropriate decision-making channels.

54 In May and July of 2021, the Missouri Attorney General filed two separate suits against St. Louis County Executive Sam Page and the St. Louis County Department of Public Health Director Dr. Faisal Khan in the first suit and Page, St. Louis Mayor Tishaura Jones, and the city and county health departments in the second suit.

Early collaborations across local jurisdictions became frayed as pandemic policies diverged. Many stakeholders, especially those in health care, the education sector, and public health, voiced concerns that the state's local control response did not make sense from an airborne disease standpoint. In the words of one stakeholder, *"This virus doesn't care about our political borders. It's going to move, and we should have had some consistency in what our response was as a state."* The lack of consistent policy was also felt in the business community, which needed to know *"what you want me to do and how long you want me to do it."*

Many residents in the focus groups found the decentralized approach imprudent given the area's population density and the frequent interchange of people across counties: *"We have a lot of people in a fairly small concentrated geographic area, but we have several different counties [and] they all do their own thing… and it was extremely confusing for people who don't really know anything about viruses."*

Some stakeholders appreciated the nimbleness of a local control approach and the flexibility it gave to leaders to customize the pandemic response to community needs. For example, a faith-based stakeholder considered locally driven communications to be *"more helpful,"* while a business stakeholder *"enjoyed the freedom to choose"* practices that seemed to fit the circumstances of their community.

Vaccine distribution

Stakeholders and focus group residents felt the lack of coordination between federal, state and local levels disrupted the vaccine rollout. In the early phases of the rollout, the state received incomplete information related to certain federal distribution channels, including the timing and amount of vaccine allocation to FQHCs and pharmacies. At the same time, the state's distribution plans for local public health and health care organizations were unclear to localities as they tried to anticipate demand and gear up for the first phase of inoculations. As one public health stakeholder explained, *"Tomorrow I will get vaccine[s]. I still don't know how much vaccine I'm getting as the state does not disclose that to me. I wait and see what shows up… That makes it very hard to plan because they also have this expectation that I administer that vaccine within seven days. It takes hundreds of people to have one of these mass vaccination clinics."*

The question of authority was also raised in a number of the focus groups, where participants had mixed reactions to the interplay between the state and local levels.

Many stakeholders and residents described the inequities of rural areas getting a disproportionate share of doses before the more populous St. Louis region.[55] North St. Louis was considered by several stakeholders to be a *"vaccine desert."* The state's decision to disseminate through hospitals first, instead of FQHCs and community providers, complicated access for many of the vulnerable populations living in underserved areas without proximity to a hospital.[56] Transportation issues and the online vaccination registration system were also cited by residents and stakeholders as barriers to access.

An overwhelming majority of Black focus group participants were frustrated with the vaccine distribution process, suggesting that initial allocation of doses went to areas in St. Louis County and the surrounding counties with higher proportions of White residents, which delayed access for some of the most at-risk populations. This misallocation made some feel like *"the government doesn't care about a certain population."*

55 Munz, M. (2021, February 22). Tired of waiting: elderly, sick in St. Louis area drive hours to get vaccine. *St. Louis Post-Dispatch*. https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/tired-of-waiting-elderly-sick-in-st-louis-area-drive-hours-to-get-vaccine/article_87798811-0a92-5954-8309-ca71b4830645.html

56 Weinberg, T. (2021, February 9). St. Louis County sounds alarm at dwindling COVID vaccine supply, appointments may pause. *St. Louis Public Radio*. https://news.stlpublicradio.org/health-science-environment/2021-02-09/st-louis-county-sounds-alarm-at-dwindling-covid-vaccine-supply-appointments-may-pause

E. Inconsistent Data Reporting and Outdated IT Systems Stymied a Timely and Targeted Response

> "And because we didn't have a great system in terms of communicable disease data management to communicate back and forth quickly, that meant everything was being done on paper and/or on systems that were not capable of handling the capacity, the volume. So that was challenging."
>
> — LOCAL PUBLIC HEALTH STAKEHOLDER

LPHAs in the St. Louis region are accustomed to collecting and analyzing public health data. But during the pandemic, local public health IT infrastructure and capacity were not uniform or interoperable with other sectors. In one example, an LPHA used an Excel form as its case contact management system. Another public health department sought the help of a volunteer to build their case reporting and contact tracing databases from the ground up using REDCap.[57] Although health care organizations tended to use more sophisticated technology for their data collection and reporting, this was not universal — for example, at least one long-term care facility used Excel to track point-of-care testing.

The lack of a modern statewide reporting system and of consistent methods for reporting created barriers for early pandemic tracking efforts. A local public health department staff member explained: *"The state was really slow to make some of those policies and make some of the data and communications on how they wanted investigations reported back up."* As a result, information sharing was slow and case data reported by the state did not always align with data reported at the local level. One health care organization employee called the state's system *"very antiquated"* and reported that people *"lost confidence in the state's numbers"* because of it.

Several focus group residents also noted that inconsistent data from the state level caused them to question the state's ability to effectively manage the response: *"Missouri's tracker — it seems wrong. I know it was wrong."* Other participants noted delays in reporting numbers of cases, hospitalizations, and deaths, which further

57 REDCap is a web-based data collection software program that can be utilized to capture diverse types of data, including COVID-19 case data. For more information, see: https://www.project-redcap.org/.

undermined their trust in LPHAs. As a result, some participants looked elsewhere for information and found a local Joplin resident, Matthew Holloway, to be a more timely and reliable source.[58] One focus group participant reported, *"He posts every day the data from across the state because not all the data's accurate or up-to-date. So, he took that project on, and I follow him, and I trust him as well."*

In order to improve tracking and increase the accuracy of data, the state eventually implemented state-wide reporting systems, including EpiTrax and MO ACTS.[59] Local stakeholders, however, noted that the implementation of these systems came late in the response and caused frustration as already overburdened LPHA staff had to switch gears midstream: *"everybody's sort of built their own [system] to start with and now they're trying to transition over into what the state's trying to create."*

Notably, the ability of all four Greater St. Louis area public health departments to collect data by race and ethnicity (via ZIP code data) was instrumental in the identification of disparities in health outcomes and access issues related to the COVID-19 in the area. As early as April 2020, the region's public health and health care organizations had indications that the virus was disproportionately impacting communities with greater numbers of Black residents, and worked with the Missouri Hospital Association to document these disparities.[60] Further analysis that used area hospitalization data uncovered inequitable testing within these communities.[61,62]

While the state's early data reporting system was not sophisticated enough to provide such data at a granular level, the state made efforts to facilitate access to local data: *"What the state did do is they allowed public health departments to request data independently from different health care providers and testing labs that were serving the residents of their county. That provided a legal mechanism…to request COVID testing, hospital admission, death, race, comorbidities, a lot of additional data from health systems [themselves], which was more than what they were getting from the state centralized database."* However, some stakeholders felt that the collection and use of data by race and ethnicity could have been more consistent and better utilized for response purposes, including to target vaccination outreach. As one community organization noted: *"Nobody's data system is working to collect race data the appropriate way."*

During the vaccine rollout, LPHAs and health care organizations were tasked with identifying their own registration solutions, which were not always the most efficient or user friendly. One health care organization described maintaining sign-ups through the platform they chose as *"a laborious, very manual process. I had one staff that had to stay up overnight so that we didn't get too many people in certain slots."* By the time the state implemented the Vaccine Navigator platform, many LPHAs already had robust sign-up lists of their own, with one LPHA noting they had as many as 100,000 on their list before Vaccine Navigator was launched.

58 Holloway, M. Missouri COVID-19 update. (2020). https://theholloway.wixsite.com/mholloway-covid19

59 Missouri Department of Health and Senior Services. COVID-19 technology response system. (2020). https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/technology.php

60 Reidhead, M., Johnson-Javois, B., Brown, A., Brinkmann, J., Joynt Maddox, K.E., McBride, T., Porth, L., Long, P., McDowell, V., Stoermer, A., Schmidt, S., Echols, F., Purnell, J., Ross, W. The disproportionate Impact of COVID-19 on Black and African American communities in the St. Louis Region. Available at https://bit.ly/COVID19_STL

61 Mody, A., Pfeifauf, K., Geng E. Using lorenz curves to measure racial inequities in COVID-19 testing. *JAMA network open*. 2021;4(1):e2032696-e2032696. doi:10.1001/jamanetworkopen.2020.32696

62 Mody, A., Pfeifauf K., Bradley, C., Fox, B., Hlatshwayo, M.G., Ross, W., Sanders-Thompson, V., Joynt Maddox, K., Reidhead, M., Schootman, M., Powderly, W.G., Geng, E.H. Understanding drivers of coronavirus disease 2019 (COVID-19) racial disparities: a population-level analysis of COVID-19 testing among Black and White populations. *Clinical Infectious Diseases*, Volume 73, Issue 9, 1 November 2021, Pages e2921–e2931.

F. Trusted Information Sources Enhanced Communication Efforts But Contended with Misinformation and Inconsistent Messaging

> "What could we have done better? I don't know. I feel like most things boil down to communication."
>
> — COMMUNITY ORGANIZATION STAKEHOLDER

Stakeholders across sectors said that clear communication with the public was a critical tool in the response. Communication strategies took several forms and mediums. For example, local public health partnered with community leaders and the Regional Health Commission to launch PrepareSTL. Commercials, social media campaigns, and canvassing efforts were used to educate the community on COVID-19 and how to connect with social services.

Focus group participants were aware of many of these communication strategies and discussed the importance of press briefings, community outreach, and online strategies. A number of residents also pointed to the utility of trusted social media platforms as a way to amplify the public health messaging, including from public health departments and the Task Force. Some described how social media can be a powerful tool for conveying information and curating reliable sources geared to younger people: *"I think a lot of my friends… got their information from articles shared on Twitter and Instagram, because my demographic, the 20-somethings, don't really watch the news that often, so they're always on their phones."*

Tailored and grassroots strategies were employed to provide information to a variety of individuals and communities and efforts were made to provide complicated information—as one health care stakeholder put it—in *"readable plain language information to the community."* For example, health care leaders provided guidance to the community, including lengthy videos encouraging vaccination. The City of St. Louis created a FAQ page about the COVID-19 vaccine development; St. Louis County held town halls about the vaccine; and organizations partnered to provide vaccine awareness and vaccine knowledge, particularly in North St. Louis.

Inconsistencies in Public Health Messaging and Misinformation

Stakeholders across sectors felt that, in spite of their best efforts, they contended with confusion and apprehension due to evolving guidance related to the novel virus and inconsistent messaging across counties and the state. One community organization stakeholder noted: *"The guidance kept changing. That made people feel like they didn't trust it, even though that's what it's supposed to do. It's supposed to evolve as we learn more, but people didn't trust that."*

Focus group residents echoed stakeholders' frustrations and suggested that inconsistent communications undermined the importance of public health messaging: *"I really think that probably the biggest failure of this pandemic was there was not clear messaging from all levels of government, and I think if we can have that now, it will help convince a lot of… people."*

Most focus group participants said they also worried about the influence misinformation might have had on the public's behaviors and how its spread undermined evidence-based messaging. As one resident reported, referring to public health guidance: *"The people I've talked to, they know what's being said by the health care community, they don't agree, and they're not willing to do it."* A few residents highlighted the negative role social media played in quickly spreading misinformation to large numbers of people and stoking negative sentiment toward public health measures.

Misinformation was especially pervasive when it came to the vaccine, and many focus group residents said they thought better messaging around the development and safety of the vaccine, and an explanation of the reason for their rapid emergency use authorization, might help address some of the legitimate hesitancy in their communities.[63] Some focus group participants expressed disappointment that decisionmakers in the state did not try to dispel misinformation by more emphatically encouraging people to get it. One participant recounted a local press conference that was held when the vaccine became available: *"I was very surprised that the tone was… much more 'It's an important decision. We would never want to force someone to do something to their own bodies,' and to me, that was a real missed opportunity… So, I think… those elected leaders or leaders in government ought to have said, 'Yes, I got vaccinated. I trust this. I think it's the right step for our community'—I think it's an important message and something that many people would be persuaded by."*

"I really think that probably the biggest failure of this pandemic was there was not clear messaging from all levels of government, and I think if we can have that now, it will help convince a lot of… people."
– Focus group resident

Trust in Communication Sources

Using a trusted messenger to convey information was recognized as an effective strategy in the St. Louis area's pandemic response, and was one that was frequently employed. For example, PrepareSTL looked to individuals from the community to hold conversations with friends, family, and others about protecting themselves from the virus. The Jefferson County Public Health Department made sure to create education campaigns in collaboration with community leaders to ensure messaging was coming from multiple trusted sources of information in the community.

Focus group residents also talked about sources of information they relied on most to get updates on the pandemic. Information coming from local officials and medical professionals, such as Dr. Garza from the Task Force, were highlighted by some residents as especially helpful and trustworthy, particularly at the beginning of the pandemic when many people relied on press briefings for information. Poll data from residents who

63 The GW study's findings are consistent with findings from work previously commissioned by the Missouri Foundation for Health, investigating Missourians' attitudes towards COVID-19, vaccines, and vaccine messaging. See: Perry Undem & Betty & Smith. (February 2021). Insights from twelve focus groups: messaging to Missourians about the COVID-19 vaccine. https://mffh.org/wp-content/uploads/2021/03/MFH-Vaccine-Presentation-FINAL.pdf.

participated in focus groups showed that an overwhelming majority said they mostly or completely trusted information coming from their LPHA (90%) and local hospital and health care leaders like the Task Force (94%).

Many health care and community-based organization stakeholders, however, noted a need for direct interaction with the community in order to build trust. As one community organization leader put it: *"How do you get masks, hand sanitizer, and accurate information to people who we know won't trust the usual media outlets, won't believe anybody else?... They'll believe me when I come to their door and say to them, as part of their community, 'This is what's happening, and this is what you need to consider, and here in your hands is what will help you through this.'"*

The Task Force was not always viewed as the best mechanism for community outreach, particularly with vulnerable populations. One health center staff member explained: *"The population that we serve is not really interested in the Pandemic Task Force. They will not log in to hear Dr. Garza speak about the data and hospitalizations. That's just not a concern for them."* Health centers and community organizations located in these communities were thought to be better positioned to build trust, actively listen to community needs and concerns, and offer information.

Poll data from residents who participated in focus groups showed that an overwhelming majority said they mostly or completely trusted information coming from their LPHA (90%) and local hospital and health care leaders like the Task Force (94%).

Many residents echoed these sentiments, using vaccine messaging as an example. Several said hearing from community doctors and nurses about the risks and benefits of the vaccine was important because these medical professionals had built up trust and rapport with the community. A number of Black focus group participants said they would appreciate messaging that is inclusive of Black people and shows how the vaccine is affecting people in their communities. One participant described feeling reassured when they realized *"a Black lady basically was one of the main people that was involved with putting [the research] together. So that made me feel better."*

Other residents were confused by the different partnerships and spokespeople discussing the local impact of the pandemic, at times questioning who they should be following for the best, most up-to-date information on the pandemic. Several who lived outside of St. Louis City and St. Louis County also felt their local leaders did not seem to have as strong a voice or media presence as the Task Force. These focus group participants said they turned to national sources of information instead of local leaders: *"There was a St. Louis pandemic group with some doctor that was kind of covering the St. Louis region, but as far as St. Charles County, there hasn't been anybody saying anything. So I mean, it's basically been following what the national news is saying as far as where we are, the CDC."*

G. Racial Inequities Were Not Effectively Anticipated and Addressed by the Local and State Response, with Tragic Consequences

> "'Oh, we want data and we want equitable distribution of vaccines'... Nobody's worried about equitable distribution of really anything in St. Louis, and now you want to do it for [vaccines]?"
>
> — HEALTH CARE STAKEHOLDER

COVID-19 exacerbated racial and ethnic inequities in a way that was both predictable and regrettably familiar to many in the region. Based on Missouri's COVID-19 case reporting, Hispanic/Latino people were more likely to contract COVID-19 and Black people were more likely to die from COVID-19 than White residents.[64] Public health equity was a major concern among stakeholders and focus group participants in the region, and especially among people in St. Louis City and County.

Many stakeholders advocated for a better distribution of resources based on data analysis showing racial and ethnic disparities. One public health stakeholder was especially frustrated by the distribution of COVID-19 funding: *"After we documented that the more severe cases of COVID were in this underserved area of North St. Louis, the deaths were disproportionately in North St. Louis, the Cares Act Funding went predominantly to St. Louis County… So that's alarming and that only perpetuates the inequities that we have here in the City of St. Louis."* According to several stakeholders, considerable expertise across sectors in St. Louis City and County was not adequately leveraged to create equitable action strategies. Some stakeholders mentioned that while discussions around race and equity take place in the St. Louis area, most organizations are still relatively new to developing interventions to address inequities in their own institutions.

Black focus group residents recounted experiencing racism and discrimination within the context of the pandemic. Most Black participants in the focus groups expressed frustration that leaders were not doing more to address their unique needs. Some felt elected officials as high up as the governor were ignoring them altogether, while others felt leaders were simply paying lip service to the concerns of Black and Brown communities. One resident said, *"I think the attitude overall has been to*

64 The COVID Tracking Project. Missouri: all race and ethnicity data. (2021). https://covidtracking.com/data/state/missouri/race-ethnicity

ignore [the disparity] and downplay it and certainly I don't think there's been any particular focus on caring about what disparate impacts the virus might have." Another participant suggested leaders were focusing on the concerns of White residents over those of Black residents, *"The people that were leading the charge were leading in the wrong way… They were making it worse, trying to cater to the White business owners."* Some residents in the focus groups felt that the high cost and limited availability of tests in predominantly Black and minority neighborhoods suggested that those in charge *"did not care"* about their communities.

A number of Black residents reported that community- and faith-based organizations were filling the void, reaching out to the most vulnerable and needy residents in the region, including Black, Brown, immigrant, and non-English-speaking groups. Several participants said these groups played an essential role in the pandemic response because they were trusted organizations that already regularly served these populations. These organizations have been especially helpful in encouraging uptake of the vaccine among minority residents, some of whom have been reluctant to get inoculated because of mistrust in the government.

Language and Cultural Barriers

Throughout the state, the COVID-19 pandemic exacerbated language and cultural barriers that hindered access to pandemic-related services for people with limited English proficiency. In the St. Louis region, LPHAs did not always have the resources to provide culturally and linguistically tailored information. Advocates explained that immigrant communities experienced trouble accessing the vaccine when information about it was not available in multiple languages.[65] One public health stakeholder in St. Charles County noted the need for mobile vaccination sites that target Hispanic/Latino and non-English speaking groups to have appropriate, accessible resources for people with limited English proficiency. They also cautioned not to tie these resources to the National Guard or law enforcement because *"those that may not have a legal status in the country are afraid to come to [mass vaccination events] because they know that the National Guard is with us for some of our events."*

In response to disparities in vaccine uptake and health outcomes among the Hispanic/Latino, immigrant, and non-English speaking populations, community and volunteer-based organizations like STL Juntos worked to provide more culturally tailored pandemic resources. STL Juntos started its volunteer support services in response to the pandemic, and has since been lauded for helping lead the state in vaccination rates among the Hispanic and Latino population.[66,67]

Throughout the state, the COVID-19 pandemic exacerbated language and cultural barriers that hindered access to pandemic-related services for people with limited English proficiency.

65 Henderson, A. (2021, March 11). Language hinders St. Louis immigrants from registering for COVID-19 vaccine. *St. Louis Public Radio*. https://news.stlpublicradio.org/coronavirus/2021-03-11/language-hinders-st-louis-immigrants-from-registering-for-covid-19-vaccine

66 Hamdan, L. (2021, September 24). How STL Juntos helped Latinos lead Missouri in vaccinations. *St. Louis Public Radio*. https://news.stlpublicradio.org/show/st-louis-on-the-air/2021-09-24/how-stl-juntos-helped-latinos-lead-missouri-in-vaccinations

67 Ndugga, N., Hill, L., Artiga, S., Haldar, S. Latest data on COVID-19 vaccinations by race/ethnicity. (2021, December). Kaiser Family Foundation. https://www.kff.org/coronavirus-covid-19/issue-brief/latest-data-on-covid-19-vaccinations-by-race-ethnicity/

H. The Public Health Response Did Not Sufficiently Meet the Needs of People Living in Poverty

> "I think we underestimated the level of poverty … [the] impact of poverty, … having individuals who are struggling on a day-to-day basis to provide food and to provide shelter for just themselves and their families, but then also to have some businesses in poor neighborhoods inflating prices, or price gouging, and making it so that individuals can't afford a simple disposable face mask."
>
> — LOCAL PUBLIC HEALTH STAKEHOLDER

As the St. Louis region experienced school and business closures, unemployment rates tripled in all four areas by May or June of 2020, compared to earlier in the year, further straining communities.[68] One focus group resident working at a hospital said, *"I just think it was so overwhelming … dealing with living check [to] check, and now on top of that, you got to worry about a virus … I just think it just took a huge toll."* Stakeholders and focus group residents highlighted challenges accessing food, housing, and transportation, as well as income declines with reduced or lost wages.

Transportation emerged as a significant access barrier to social services and to testing and vaccines. Public transportation was not available in all neighborhoods; even when it was available, it risked exposing people to the virus and therefore served as a disincentive to mitigation efforts. According to focus group participants, some local food distribution sites were actively involved in addressing food insecurity but were not always convenient to those in need, requiring that some residents rely on public transit and haul heavy boxes from the sites.

Barriers to access caused by a lack of technology were also a source of concern. According to one stakeholder in a community-based organization, *"The issue with telehealth was our patient population didn't actually have internet and phone service, so it became a different barrier and [health care providers] had to figure out how to cover those types of needs."* Residents indicated that relying on the internet to disseminate public health messaging and access public health services excluded vulnerable communities, including those living in poverty, people experiencing homelessness, and older adults. A resident working in health care explained that health care organizations sometimes wrongly assume that people have internet access, saying, *"In a lot of our communities … [people] are in a poorer environment and they don't have access to Wi-Fi. They've been impacted tremendously by not being able to schedule appointments to get a test, to get a vaccine. A number of them had symptoms and weren't able to get tested, and ended up dying from the virus."*

Partnerships like the RRT mobilized efforts to provide housing and social service supports, and local philanthropies restructured some of their grantmaking to address exigencies created by the pandemic. Nevertheless, these efforts sometimes fell short of meeting the substantial need, and certainly were not targeted to addressing the root causes of decades of poverty in the region.

68 Missouri Department of Labor & Industrial Relations. Unemployment benefits by county. (2021). https://laborwebapps.mo.gov/ui_stats?s=1&county=107&month_year=All+Months%2FYears

Key Recommendations: Strengthening the Public Health Response to COVID-19 and Future Crises in the St Louis Region of Missouri

The infusion of new federal dollars into Missouri has the potential to bring more money to the state's public health infrastructure than ever before. Our hope is that these findings will be leveraged for the purpose of strengthening the public health system's ability to continue to respond to the COVID-19 pandemic and face future crises with greater resources coordination, equitable strategies, modernized infrastructure, and public trust. Specific recommendations for advancing this vision are detailed in our report *Missouri's Public Health Response to COVID-19: Key Findings and Recommendations for State Action and Investment.*[69]

69 Levi, J., Regenstein, M., Hughes, D., Trott, J., Markus, A., Seyoum, S., Acosta, A., Benoit, M., Van Bronkhorst, H., Conway, C. "Missouri's Public Health Response to COVID-19: Key Findings and Recommendations for State Action and Investment". (September 2021). Health Policy and Management Issue Briefs. Paper 61. https://hsrc.himmelfarb.gwu.edu/sphhs_policy_briefs/61

TABLE 1. MISSOURI'S PUBLIC HEALTH RESPONSE TO COVID-19: KEY RECOMMENDATIONS FOR STRENGTHENING PUBLIC HEALTH INFRASTRUCTURE IN MISSOURI

Recommendation		The State of Missouri Should:
1	Provide financial support and technical assistance for public health accreditation.	Create a special fund to provide technical assistance for LPHAs to assess readiness for accreditation via the Public Health Accreditation Board, identify costs to close gaps, and cover fees associated with the accreditation application process.
2	Prioritize equity.	Expand funding, staff, and other support to help LPHAs integrate equity principles into data collection and reporting and community engagement (i.e., trust building, links to social services). Increase workforce and funding for the Office of Minority Health.
3	Build a modernized surveillance system.	Build a modernized system and provide LPHAs or regional bodies with hardware and software to manage the system, consistent with federal standards.
4	Create regional coordinating bodies.	Incentivize and support greater formal sharing of staffing and services among smaller LPHAs, with a lead public health agency designated to convene and coordinate, designed to develop and strengthen all foundational public health capabilities.
5	Bolster the public health workforce.	Support workforce development through equitable recruiting, hiring, and promotion practices; new training programs; enhanced salaries for LPHA leaders with advanced training; and by deploying skilled staff within regions.
6	Ensure equitable public health funding across the state.	Provide a minimum level of funding for LPHAs, linked to delivery of foundational public health services and an equity analysis incorporating social vulnerability, and ensure that public health money flows directly to LPHAs.
7	Clarify LPHA governance structure and authorities.	Commission legal analysis to create greater consistency in decision making and oversight across LPHA governance and financing.
8	Harmonize policy development.	Ensure consistent policies across jurisdictions for public health prevention and mitigation measures. DHSS should establish and adhere to protocols for consultation with LPHAs on new policies during emergencies.

SOURCE: Levi, J., Regenstein, M., Hughes, D., Trott, J., Markus, A., Seyoum, S., Acosta, A., Benoit, M., Van Bronkhorst, H., Conway, C. "Missouri's Public Health Response to COVID-19: Key Findings and Recommendations for State Action and Investment". (September 2021). Health Policy and Management Issue Briefs. Paper 61. https://hsrc.himmelfarb.gwu.edu/sphhs_policy_briefs/61

Appendix A: Methods and Data Sources

Stakeholder Interviews

This project employed a mixed-methods, qualitative comparative case study approach to conduct an evaluation of the public health response to COVID-19 in Missouri. The findings in this report come principally from interviews with stakeholders. A total of 131 stakeholders from state and local public health departments, elected and other government officials, health care organizations, educational institutions, the business community, faith-based organizations, membership associations, and a variety of social support services and other non-profits were interviewed virtually from October 2020 to May 2021. Forty stakeholders were interviewed in the St. Louis region *(Table A)*. Interviews were supplemented by media accounts and other publicly available data sources, as well as focus groups with 50 residents in Missouri *(Table B)*.

A purposeful sample of stakeholders was recruited in four areas in the St. Louis metropolitan area (City of St. Louis, Jefferson County, St. Charles County, and St. Louis County) *(Table A)* to reflect variation in experiences with public health practice, local governmental processes and structures, and potential opportunities for strengthening public health statewide. Participants were recruited through snowball sampling, reviews of media reports, and general research techniques. All interviewees were promised confidentiality. Interview questions came from guides developed by GW for this study and customized to the sector represented by the interviewee. In the vast majority of cases, each interview consisted of one individual stakeholder and two GW study members. Interviewees did not receive compensation for their participation.

Interviews were audio-recorded with permission and then transcribed. Alternatively, careful note-taking was used when interviewees did not consent to audio-recording. All of the transcripts and notes were coded using the Dedoose qualitative software platform and following standard protocols for building a codebook and applying the codes to transcripts. Each interview transcript was coded by two or more GW study team members. Coded interview excerpts were reviewed for common themes, both within and across geographic regions. Themes were identified based on a variety of rationales, including the frequency with which they were mentioned in different transcripts and regions, the emphasis with which they were presented, and consensus amongst different GW study team members.

The selection of regions for in-depth analysis was informed by the Missouri State Emergency Management System (SEMA) division of the state into nine distinct regions (A-I), which are each affiliated with a Highway Patrol Troop. Highway Region C consists of the four areas profiled in this report, plus eight additional counties located in the eastern central portion of Missouri (Figure 2).[70] This analysis focuses on the following four areas: City of St. Louis, Jefferson County, St. Charles County, and St. Louis County.[71] These areas collectively represent approximately 85% of Region C's population.

Quotes were selected from transcribed interviews in the region and were condensed, abbreviated, or minorly redacted to protect confidentiality and clarify phrases in the event that the transcription service made errors or if the interviewees repeated themselves or added filler words (e.g., "um") that distracted from their overall statements.

70 In addition to the four areas profiled in this report, Region C includes Franklin County, Lincoln County, Perry County, Pike County, St. Francois County, Ste. Genevieve County, Warren County, and Washington County.

71 Missouri Department of Public Safety SEMA. State regional coordinators program. https://sema.dps.mo.gov/programs/area_coordinator.php

TABLE A. INTERVIEWEES IN ST. LOUIS MISSOURI (OCTOBER 2020 – MAY 2021)

Sector	Who is Included?	Number of Interviews
Business	Chamber of commerce, business councils, economic groups	3
Community/Faith Organizations	Non-profits, for-profits, health networks, community partnerships, social services, churches, faith-based social service organizations	9
Education	K-12, higher education, and education-focused entities	5
Health Care	Hospitals and health centers, health care associations, long-term care facilities, and behavioral health	11
Policy	Government entities (city, county)	1
Public Health	Emergency management, LPHAs, research, and other public health-focused organizations	11
Total		40

Focus Groups with Residents

We held 11 focus groups and four one-on-one interviews with a total of 50 participants, all of whom resided in the St. Louis region. We recruited participants through community-based organizations and leaders, faith-based institutions, local public health forums, such as COVID-19-related Facebook groups, and other community coalitions. We also used a qualitative market research firm to help recruit Black participants.

Our focus group sample comprises self-selected participants, who take the pandemic very seriously. In line with the convention of purposeful sampling in qualitative evaluations, this sample provides us with an intentionally well-informed group of participants, who have thoughtful and reasoned input on the public health response in Missouri. While we appreciate participation from a more representative population of residents would have given us perspective on those with whom the public health response struggles to engage, we believe our sample provides a more useful and accurate assessment of how the public health response unfolded, how it was interpreted by those who understood its importance, and how the social and political context in the state impacted it.

We collected socio-demographic information from participants using a screening survey disseminated prior to the focus groups. Participants also provided information on COVID-19-related questions, including changes in employment and housing as a result of the pandemic, whether they worked in an essential job, whether they had school-age children, whether they had tested positive for COVID-19 and their vaccination status. During the focus groups, we also collected information from participants using Google polls. These polls focused on topics related to the public health response and asked participants to: reflect on specific guidelines, including those recommended by the CDC; identify sources of information they use to get updates on the pandemic; and report their level of confidence in local public health officials.

All focus groups were conducted via Zoom and participants were invited to contribute through oral discussion or written comments using the chat function. Focus groups were recorded and transcribed for accuracy. Study members analyzed transcripts and chat records using *NVivo* software and examined key themes that emerged during the discussions. Themes were identified based on the

frequency and intensity with which participants discussed an issue both across and within groups. Poll data were also analyzed to triangulate themes that emerged in the groups. Focus group participants received gift cards to Amazon or local stores in appreciation of their time.

Socio-Demographics of Focus Group Participants

We collected socio-demographic information from participants using a screening survey disseminated prior to the focus groups. While the majority of participants in the focus groups lived in St. Louis City and County, we also had residents participate from Jefferson County and St. Charles County. The vast majority (86%) of participants were female and a majority (60%) were below the age of 50. Less than half of the participants (40%) identified as White, while a majority (60%) identified as Black.

Half of respondents (54%) had completed either some college/two-year degree or four years of college, and 38% had earned a graduate degree. Most (66%) had a household income of less than $99,000. Those participating in focus groups had a variety of employment situations. Most (62%) reported they worked as paid employees, and a small percentage (18%) said they were retired. Another 20% reported not working at the time of the focus group. Most participants lived in urban communities, with the majority (58%) reporting they lived in a city/metro area with a population of 250,000 people or more. More information about the St. Louis focus group participants can be found in Table B.

TABLE B. ST. LOUIS FOCUS GROUP PARTICIPANT DEMOGRAPHICS

Number of Respondents	50

Age	Respondents (% of total)
21-29	11 (22%)
30-39	7 (14%)
40-49	12 (24%)
50-59	6 (12%)
60-69	10 (20%)
70+	4 (8%)

Gender	Respondents (% of total)
N (%) female	43 (86%)

Race/Ethnicity	Respondents (% of total)
White	20 (40%)
Black	30 (60%)
Other	0 (0%)

Identify as Hispanic/Latino	Respondents (% of total)
N (%)	0 (0%)

Language	Respondents (% of total)
Speaking a language other than English at home, N (%)	2 (4%)

TABLE B. ST. LOUIS FOCUS GROUP PARTICIPANT DEMOGRAPHICS (CONTINUED)

Number of Respondents	50

Highest Grade Level/ School	Respondents (% of total)
Some high school, but did not graduate	0 (0%)
High school degree or GED	4 (8%)
Some college or 2-year degree	14 (28%)
4-year college graduate	13 (26%)
Graduate school degree	19 (38%)
Other/prefer not to answer	0 (0%)

Income	Respondents (% of total)
Less than $49,999	13 (26%)
Between $50,000-$99,999	20 (40%)
Between $100,000-$149,000	6 (12%)
Above $150,000	6 (12%)
Other/prefer not to answer	5 (10%)

Employment Status	Respondents (% of total)
Working (as paid employee)	31 (62%)
Self-employed	0 (0%)
Retired	9 (18%)
Not working*	10 (20%)

Urban-Rural Makeup	Respondents (% of total)
City/Metro Area with a Population of 250,000 or more people	39 (78%)
City/Metro Area with a Population of 50,000 to 250,000 people	10 (20%)
City/Metro Area with a Population of 20,000 to 49,000 people	0 (0%)
Non-Metro Area (population of ≤ 20,000)	0 (0%)
Other/prefer not to answer	1 (2%)

*Category includes those that are unemployed, students, and those with disabilities which prevent them from working

TABLE C. PUBLIC HEALTH INFRASTRUCTURE AND DEMOGRAPHICS IN ST. LOUIS MISSOURI

County	Population[72]	Racial & Ethnic Composition[73]	Persons living below poverty (%)[74]	LPHA Governance[75]	Per Capita Public Health Revenue[76]
City of St. Louis+	301,578	White: 43.6% Black: 46.4% AI or AN: .3% Asian or PI: 3.5% Multiracial: 2.4% Hispanic: 4.0%	21.8%	City Council (Board of Aldermen)	$70.83
Jefferson County*	226,739	White: 94.1% Black: 1.2% AI or AN: .3% Asian or PI: .8% Multiracial: 1.6% Hispanic: 2.1%	8.4%	Board of Trustees	$29.97
St. Charles County	405,262	White: 86.6% Black: 5.3% AI or AN: .2% Asian or PI: 2.9% Multiracial: 2.1% Hispanic: 3.4%	4.6%	County Council	$12.03
St. Louis County+	1,004,125	White: 65.3% Black: 25% AI or AN: .2% Asian or PI: 4.7% Multiracial: 2.2% Hispanic: 3%	9.3%	County Council	$54.96

**MICH Accreditation[77], + PHAB Accreditation[78]*

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