Michigan Association for Local Public Health COVID-19 After-action Review

Final Report

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PSC

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Executive Summary

The COVID-19 pandemic that struck the United States in early 2020 gave rise to a maelstrom of efforts to keep people safe from its devastating effects. In Michigan, the pandemic response was led by the Michigan Department of Health and Human Services (MDHHS) and the state's 45 local health departments (LHDs) with guidance from the Centers for Disease Control and Prevention (CDC) and other federal agencies.

The Michigan Association for Local Public Health (MALPH) asked Public Sector Consultants (PSC), a public policy research and evaluation firm based in Lansing, to conduct an after-action review of the local public health system's response to highlight what went well and also where there are opportunities to be better-prepared should a future large-scale public health emergency (PHE) reach the state again.

Methods and Focus

PSC's research included a review of the state's Public Health Code (PHC), orders issued at the state and federal levels, and the infrastructure in place to support the public health system. PSC also held 27 individual and group conversations with people with intimate knowledge of the state and local response to the pandemic to gain insight into the on-the-ground reality of the people working to carry out the response.

The local public health response efforts had three primary components, each of which is examined in detail in the after-action review (AAR):

- Creating and enforcing pandemic orders and guidance
- Conducting contact tracing and case investigation
- Distributing and administering vaccines

Underlying the entire response was Michigan's existing emergency preparedness and public health infrastructure. The effects of this infrastructure are examined in the final section of the report.

Key Findings

Creating and Enforcing Pandemic Orders and Guidance

Michigan's PHC requires MDHHS and LHDs to issue orders to prevent or avoid danger associated with public health threats. It also grants authority to enforce orders to both of these entities. This dual authority had both positive and negative impacts on the public health response to the pandemic. LHDs' authority allowed them to tailor orders to their communities' unique needs and circumstances, and MDHHS' authority, in theory, supported a cohesive statewide response. However, having authority at both the state and local levels created confusion, led to LHD orders being undermined, and belied a lack of cohesion and clarity that frustrated the public and local leaders.

In addition, new orders were being released by MDHHS at what some described as a "frenzied" pace, leaving little time for interpretation and communication to either public health staff or the public. Many residents and public leaders questioned the legitimacy of and need for these orders, which made enforcement of orders challenging, especially in communities where local government leaders and school administrators were directly challenging orders. Ultimately, order enforcement became nearly impossible in some cases where no clear consequences existed.

Conducting Contact Tracing and Case Investigation

The PHC mandates that LHDs investigate transmission of infectious diseases, including identifying and contacting individuals who may have been exposed to the disease by someone with a confirmed diagnosis. Very early in the pandemic, LHDs instituted contact tracing and case investigation as a primary tool for identifying and attempting to slow the spread of COVID-19. Previous experience with this tactic as well as well-established emergency preparedness plans contributed to LHDs' ability to quickly establish a strong network of contact tracers led by dedicated LHD staff.

Several technical and logistical challenges arose, however, that threatened the success of LHD contact tracing and case investigation efforts. Inconsistent and outdated data systems were unable to keep up with the number of cases being tracked and logged. Contact tracers found it nearly impossible to meet expectations for the number of contacts they were expected to reach in a day, due in part to limited staff capacity and also to the fact that calls with contacts tended to be longer than typical contact tracing calls. The people reached early in the pandemic had a lot of questions because so little was known about COVID-19 at that time. LHD staff had to spend time quelling people's fears and supporting them in understanding what an exposure to the disease meant.

Early contact tracing efforts were met by a grateful public who feared COVID-19 and wanted to join the effort to prevent its spread. Eventually, however, the community grew tired of contact tracing and began to disregard LHD phone calls and guidance.

Distributing and Administering Vaccinations

LHDs' efforts and leadership in the distribution and administration of the COVID-19 vaccine were widely heralded as successful. They leaned into their experience and expertise in this area, which provided a strong foundation for establishing the necessary infrastructure. They also employed innovative solutions to address issues such as lack of space for vaccines and the need to vaccinate large numbers of people as quickly as possible. LHDs stood up mass vaccination clinics across the state, mobilizing staff and volunteers, to vaccinate thousands of people a day in some locations.

The challenges faced by LHDs working to distribute and administer the vaccine were based in unclear and rapidly expanding eligibility criteria for people seeking to receive the vaccine, which led to inconsistent distribution of and access to the vaccine across the state. In addition, the technology needed to establish hotlines, wait lists, and vaccine tracking slowed their efforts to respond quickly to high levels of demand. All the while, LHD staff were working with the public, broadly and individually, to increase vaccine uptake and reduce people's hesitancy to get the vaccine.

Working Within the Existing Emergency Preparedness and Public Health Infrastructure

All LHD efforts to respond to the pandemic were inextricably linked to and influenced by the systems in which they exist. These include the state's incident command structure, emergency preparedness response training, public health funding and staffing, and public awareness of public health.

Some interviewees said Michigan's State Emergency Operations Center (SEOC) and Community Health Emergency Coordination Center (CHECC) were implemented poorly during the pandemic and contributed to confusion over MDHHS and LHD roles. They also noted how the composition of the SEOC,

with siloed departments and high-status members, limited its effectiveness. There were varying assessments of the ability of LHD staff to effectively support the pandemic response, with some criticizing the level of emergency preparedness response training as inadequate.

Some held that chronic underfunding of LHDs weakened the foundation and infrastructure of local public health, impeding its ability to implement a strong response. Relatedly, staffing levels in LHDs are low in some critical areas, such as epidemiology, which further hampered their response. Finally, public health as a field and service largely functions under the public's awareness. When faced with orders and information from a previously unknown entity, many in the public became susceptible to skepticism and resisted their guidance, especially when community leaders were fueling the public's fear and doubt.

Conclusion and Recommendations

LHDs rose to many challenges and overcame multiple roadblocks in their response to the COVID-19 pandemic. However, several issues arose that limited the overall effectiveness of their response. The following recommendations offer a path toward an invigorated and reinforced public health system in Michigan, increasing the likelihood of a skillful, effective response to future PHEs.

- Ensure emergency management protocols establish clear roles and authority for future public health crises and emergencies that include a clear chain of command between MDHHS and the LHDs to ensure centralized coordination among public health leadership.
- Establish pandemic response infrastructure and readiness teams, that are broad-based across operational areas of management, finance, volunteer recruitment, and capacity building.
- Establish relationships with agencies and organizations that can support cohesive and collaborative enforcement for quarantining, masking, and closures and promote local support, including law enforcement.
- Vaccines should be distributed through the LHDs, in keeping with the standard vaccine distribution process, to avoid confusion.
- Invest in local public health infrastructure, including in data systems and LHD staffing.
    - Consider identifying, mandating, and funding minimum public health staffing levels for specific public health positions, including epidemiologists to ensure emergency and pandemic response efforts can be quickly implemented.
    - Improve training for those entering the local public health workforce and create career pathways to incentivize epidemiologists to go into public health.
    - Increase Michigan's PPE and medical device stockpile (e.g., ventilators, infrared thermometers).
    - Add public health communication and messaging to the public health curriculum and invest in communication and public information officer positions across LDHs.
- Provide training for local county leaders, hospitals, healthcare systems, and elected officials on their role in public health.

Foreword

Michigan has a comprehensive and multilevel framework for protecting and improving the health of the state's residents and their communities. The focus on community is what constitutes and defines "public health." While clinical healthcare focuses on individuals' health conditions and treatment of those conditions, public health concentrates on the broader health status of populations and works toward individual and systemic change to treat and prevent adverse health conditions. Public health is a complex system designed to protect people from unsafe or hazardous conditions and provide methods for promoting good health and preventing disease (MALPH n.d.).

The State of Michigan assigns primary responsibility for public health to the Michigan Department of Health and Human Services, local health departments or districts created by county governments, and the City of Detroit. The Michigan Public Health Code provides for a state Department of Public Health (administered through MDHHS) and a director of the department, and assigns to that director, or their designee, any functions assigned to the department in the PHC (Michigan Legislature 1978a; Michigan Legislature 1978b).

Those functions include a mandate to "continually and diligently endeavor to prevent disease, prolong life, and promote the public health through organized programs, including prevention and control of environmental health hazards; prevention and control of diseases; [and] prevention and control of health problems of particularly vulnerable population groups" (Michigan Legislature 1978c). The PHC also lists specific duties associated with those functions: collect and use vital and health statistics to protect the public health and investigate the 1) causes of disease, especially epidemics; 2) causes of morbidity and mortality; and 3) causes, prevention, and control of environmental health hazards, nuisances, and sources of illness (Michigan Legislature 1978c).

The PHC requires that county boards of commissioners provide for a county health department, either independently or through participation in a district (multicounty or city-county) partnership (Michigan Legislature 1978g). In Michigan, there are currently 45 health departments, comprising 30 single-county and 14 multicounty LHDs covering Michigan's 83 counties, and the Detroit Health Department. The PHC uses the same language cited above in assigning responsibility for public health within their jurisdiction to the LHDs, and also allows the state director to authorize or delegate to an LHD any function or duty assigned to the director by the PHC. Thus, the language of the PHC makes public health not only a state responsibility, but also a direct mandate to LHDs, creating overlapping mandates for the state and LHDs.

Michigan's State Emergency Operations Center is where "state, local, and federal agencies coordinate the response to a disaster, emergency, or terrorist event" (Michigan State Police n.d.). The SEOC, established by the Emergency Management Act, is headquartered in Lansing, and its leadership includes the governor and the state director of emergency management and homeland security, who also oversees Michigan State Police (MSP) (Michigan State Police n.d). The Community Health Emergency Coordination Center—housed within the SEOC—is intended to "provide real-time public health information, subject matter expertise, and strategic countermeasure distribution" (Michigan Department of Community Health n.d.). Both the SEOC and CHECC were activated in the state's response to the COVID-19 pandemic.

COVID-19 Timeline of Relevant Events

January 7, 2020 (Federal)

- Public health officials in China identified a novel coronavirus as the causative agent of the SARS (Severe Acute Respiratory Syndrome Coronavirus or SARS-CoV-1) outbreak.
- CDC established an incident management structure to guide their novel coronavirus response by following the preparedness plan for developing tests and managing cases made for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) (CDC March 2023).

January 20, 2020 (Federal)

- The CDC reported the first laboratory-confirmed case of the 2019 novel coronavirus in the U.S. from samples taken on January 18, 2020, in Washington state.
- The CDC activated its Emergency Operations Center (EOC) to respond to the emerging outbreak.

February 28, 2020 (State)

- Michigan activated its EOC to coordinate the state's COVID-19 response.

March 10, 2020 (State)

- MDHHS identified the first two positive COVID-19 cases in Michigan.
- Gov. Gretchen Whitmer issued Executive Order (EO) 2020-4 declaring a state of emergency.
- Governor Whitmer issued EO 2020-5 limiting gatherings to 250 people and closed schools.

March 18, 2020 (State)

- Michigan suffered its first COVID-19-related death (Shamus et al. March 2020).

March 23, 2020 (State)

- Governor issued EO 2020-21 suspending activities not necessary to protect or sustain life ("Stay Home, Stay Safe"), effective March 24, 2020–April 13, 2020.

April 2, 2020 (State)

- Governor Whitmer issued EO 2020-35 closing K–12 schools for the remainder of the school year and suspending K–12 sporting events.
- MDHHS issued emergency rules establishing fines for violating EOs issued by the governor, including stay-at-home and business-closure orders.
- MDHHS issued an order reinforcing EOs 11, 20, and 21 "authorizing local health departments to carry out and enforce the terms of this order." The orders also state that "chiefs of police, sheriffs, and other local law enforcement leaders are specifically authorized to investigate potential violations and may coordinate as necessary with the local health department and enforce this order within their jurisdiction" (MDHHS April 2020)

April 14, 2020 (State)

- Protestors opposing closure orders demonstrated for the first time at Michigan's State capitol (Egan and Berg April 2020). Protestors gather formally at the capitol at least two more times.

April 23, 2020 (Federal)

- Using funds from the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the CDC announced $631 million to fund and expand the existing Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC), allowing state health departments to expand their capacity for the testing, contact tracing, and containment of COVID-19.

May 15, 2020 (State)

- Governor Whitmer issued EO 2020-88 creating the COVID-19 Return to School Advisory Council. The Advisory Council was created to identify barriers to students' safe return and to ensure a smooth, safe transition back to school. The Council supported the governor and the COVID-19 Task Force on Education and developed recommendations to the Task Force regarding the safe, equitable, and efficient K–12 return to school in the fall of 2020 (MDHHS June 2020).

May 18, 2020 (State)

- Governor Whitmer issued EO 2020-92 allowing retail, restaurants, and offices unable to conduct business remotely to reopen in two northern regions of the state—Traverse City and the Upper Peninsula. Businesses wanting to reopen had to adopt workplace safety measures to protect employees and customers from transmitting COVID-19 (State of Michigan May 2020).

May 26, 2020 (State)

- Governor Whitmer issued EO 2020-104 establishing a process for and enabling free COVID-19 testing.

June 1, 2020 (State)

- Governor Whitmer issued EO 2020-110 rescinding orders 69 and 96 and providing temporary restrictions on events, gatherings, and businesses. The order included social distancing and face masking requirements.

June 13, 2020 (Federal)

- The CDC released consolidated guidelines for COVID-19 testing, including for nursing homes, long-term care facilities, and high-density critical infrastructure workplaces like food production facilities.

June 30, 2020 (State)

- Governor Whitmer issued EO 2020-142 requiring school districts to develop and adopt a COVID-19 Preparedness and Response Plan consistent with the MI Safe Schools Return to School Roadmap.

July 23, 2020 (Federal)

- The CDC released resources for school administrators, teachers, parents, guardians, and caregivers to help build appropriate public health strategies to slow the spread of COVID-19 in school environments.

September 3, 2020 (State)

- Governor Whitmer issued EO 2020-176 Safe Start Order, organized by the following categories, which became standardized going forward: remote work; individual responsibility (social distancing, masks); public accommodations; bars; liquor license restrictions (dance, topless activity, other activity); gatherings, events and large venues; organized sports; exceptions for Regions 6 and 8; general exceptions; parks; and pools.

October 2, 2020 (State)

- Michigan's Supreme Court ruled that Governor Whitmer can no longer issue EOs as a part of COVID-19 response without consent from Michigan's legislature. The orders issued by Governor Whitmer are no longer legal/enforceable after this date. MDHHS issued orders moving forward (Michigan Supreme Court 2020).

November 17, 2020 (Federal)

- The Food and Drug Administration (FDA) approved the first at-home COVID-19 test (FDA 2020).

December 8, 2020 (State)

- Michigan reached 10,000 confirmed COVID-19-related deaths (MDHHS n.d.a).

December 11, 2020 (Federal)

- The FDA issued an emergency-use authorization for the Pfizer-BioNTech COVID-19 vaccine. The Advisory Committee on Immunization Practices (ACIP) recommended all people 16 years and older receive the Pfizer-BioNTech vaccine to prevent COVID-19.

December 14, 2020 (Federal)

- The first COVID-19 vaccines were delivered to healthcare professionals.

March 9, 2021 (State)

- Governor Whitmer signed a $2.5 billion COVID-19 relief package, including $110 million for vaccine administration and $555 million for testing and tracing.

March 11, 2021 (Federal)

- The Biden Administration announced plans for all adult Americans to be eligible and able to receive a COVID-19 vaccine by May 1, 2021. They plan to make COVID-19 vaccines accessible by delivering vaccines to 700 community health centers in under-resourced communities, doubling the number of pharmacies providing COVID-19 vaccines and the number of federally run mass vaccination centers, deploying more than 4,000 active-duty troops to support these efforts, and by launching the "Find a Vaccination Website" with accompanying 1-800 phone number.

March 25, 2021 (Federal)

- The CDC announced $300 million in funding for states, localities, territories, tribes, and tribal organizations for community health worker (CHW) services to address: 1) disparities in access to COVID-19-related services, such as testing, contact tracing, and immunization; 2) factors that increase risk of severe COVID-19 illness, such as chronic diseases, smoking, and pregnancy; and 3) community public health needs that have been exacerbated by COVID-19, such as health and mental health care access and food insecurity.

March 31, 2021 (State)

- Michigan surpassed 25 percent of its population receiving at least one dose of any COVID-19 vaccine (MDHHS n.d.b).

July 17, 2021 (State)

- Michigan surpassed 50 percent of its population receiving at least one dose of any COVID-19 vaccine (n.d.c).

August 13, 2021 (State)

- Michigan reached 20,000 confirmed COVID-19-related deaths (MDHHS n.d.a).

November 2, 2021 (Federal)

- The ACIP recommended the Pfizer-BioNTech pediatric COVID-19 vaccine for all children ages five to 11 years old.

December 23, 2021 (Federal)

- The CDC updated its recommendations related to isolation and quarantine periods for healthcare workers, decreasing their isolation time after COVID-19 infection. Asymptomatic healthcare workers could return to work after seven days with a negative test. Healthcare workers who received all recommended COVID-19 vaccines doses, including a booster, do not need to quarantine after a high-risk exposure.

December 27, 2021 (Federal)

- The CDC shortened the recommended isolation period for people with COVID-19 to five days, followed by five days of wearing a mask around others if they are asymptomatic or if their symptoms are resolving.
- The CDC updated the recommended quarantine period for people exposed to someone with COVID-19 to wear a mask around others for ten days and get tested on day five if you have been boosted or vaccinated within the last six months. If the exposed individual is unvaccinated, the CDC recommended a quarantine period of five days, followed by strict mask use for an additional five days.

May 31, 2022 (Federal)

- The U.S. Department of Justice asked a federal appeals court to overturn the order that declared the CDC's mandate requiring individuals to wear masks unlawful.

May 11, 2023 (Federal)

- The U.S. Department of Health and Human Services ended the COVID-19 PHE. In Michigan, as in many states, extra benefits were provided connected to food assistance and Medicaid coverage throughout the duration of the PHE (HHS 2023).

Introduction

The federal COVID-19 PHE began January 27, 2020, after the first infection in the United States was identified in Seattle, Washington (HHS 2020). By March 2020, COVID-19 had spread to every state, including Michigan. The PHE prompted a large local, state, and federal response. Hospitals, particularly those in urban areas, were overwhelmed with patients seeking care for this highly contagious and deadly respiratory disease. Detroit, Michigan, was hit especially hard during the pandemic's first three months, with 15,000 known cases, overcrowded hospitals, and more than 1,400 deaths, amid a lot of uncertainty on how to treat this new virus. In addition to limited knowledge about effective treatment options, healthcare systems experienced shortages of acute-care beds, ventilators, personal protective equipment, and disease-testing resources, making them ill-prepared to handle the healthcare needs of those infected.

In spring 2022, after more than two years of COVID-19 as a part of life, the PHE response was no longer focused on crisis management and moved into a new phase, aimed at preventing severe disease through effective treatments and readily available vaccines. On May 11, 2023, with COVID-19 still present, the PHE officially came to an end (HHS 2023). Now, there is an opportunity to reflect on Michigan's response to the pandemic and conduct an after-action review to assess local and state health department responses during those first two years of the pandemic and to identify ways to strengthen the public health system's ability to respond, recover, and build resiliency during the next phases of the pandemic and beyond.

The Michigan Association for Local Public Health engaged Public Sector Consultants, a nonpartisan public policy consulting firm located in Lansing, Michigan, to conduct a COVID-19 AAR. The main goals of the review were to assess the strengths and weaknesses in LHDs' responses to the crisis, the challenges LHDs experienced during the crisis, how their structure and funding prior to the crisis contributed to their response, and to identify opportunities to ensure Michigan's public health system is well positioned to address future public health crises.

To do this, PSC met with MALPH leadership to develop a research plan and outline potential focus areas to shape the AAR. PSC met with the MALPH board of directors—comprising all local public health officers (LPHOs) across the state—and identified four areas of the pandemic response on which to focus the AAR:

- Creating and enforcing pandemic orders and guidance
- Conducting contact tracing and case investigation
- Distributing and administering vaccinations
- Emergency preparedness and public health infrastructure

PSC's research included a review of the state's public health code along with interviews and small-group discussions with state and local public health leaders, as well as others engaged in public health response to the COVID-19 pandemic. The following report offers an overview of Michigan's public health system and key findings and recommendations from the background research, interviews, and discussion groups. More information about the AAR methodology and a list of the organizations that participated in interviews and discussion groups can be found in the appendix.

Findings

The research findings are focused around the four key topic areas of:

- Creating and enforcing orders
- Conducting contact tracing and case investigation
- Distributing and administering vaccines
- Working within the existing emergency preparedness and public health infrastructure

As expected, there were several crosscutting issues that impacted multiple areas, like communication and staffing, which influenced how public health functioned and implemented response activities. These ideas are woven throughout each section but are also summarized in brief at the end of the report.

In each section, background information is provided to contextualize the interview findings with relevant information from the PHC, including LPHOs and LHDs' roles and responsibilities. Findings from the interviews are then shared to illuminate what aspects of the COVID-19 response went well and where there were challenges, as well as how the response was affected by state policies.

Creating and Enforcing Orders

Background

When the state director or LPHOs determine there is an "imminent danger" (i.e., a condition or practice which could reasonably be expected to cause death, disease, or serious physical harm immediately or before it can be eliminated through other enforcement measures), the Michigan PHC mandates the director or LPHO to "issue an order requiring immediate action to avoid, correct, or remove the imminent danger (Michigan Legislature 1978e; The Network for Public Health Law 2019). The order may specify action to be taken or prohibit the presence of individuals in locations or under conditions where the imminent danger exists, except individuals whose presence is necessary to "avoid, correct, or remove the imminent danger" (Michigan Legislature 1978e).

The PHC also grants authority to the director and LPHOs to address an epidemic, saying ". . . [they] may prohibit the gathering of people for any purpose and may establish procedures to be followed by persons, including a local governmental entity, during the epidemic to insure continuation of essential public health services and enforcement of health laws. Emergency procedures shall not be limited to this code" (Michigan Legislature 1978f; Michigan Legislature 1978j). In addition to the independent authority granted to LPHOs, the PHC permits the director to "authorize [an LHD] to exercise any power or function of the department where not otherwise prohibited" (Michigan Legislature 1978d).

In addition to creating orders, the PHC grants both the state and LPHOs authority to enforce orders in a public health emergency (Michigan Legislature 1978e; Michigan Legislature 1978i). Regardless of the existence of a declared imminent threat or epidemic, LHDs also have a specific mandate to "implement and enforce laws for which responsibility is vested in the local health department" (Michigan Legislature 1978h). Enforcement authority for state-issued orders is among the powers that may be delegated to an LPHO by the director (Michigan Legislature 1978e).

What Went Well

Despite overlapping authority between MDHHS and LHDs, there were successes related to creating and enforcing orders—existing emergency preparedness plans were initiated immediately, giving LHDs the freedom to tailor orders to their communities' needs.

Orders Tailored to Local Needs and Strong Local Collaboration

As scientific understanding of the virus evolved, MDHHS and LHDs had to interpret and implement new federal and state guidance quickly. The urgent need to act led to limited time to wait for MDHHS guidance, so LHDs made decisions and tailored orders based on their local communities' needs. MDHHS staff shared that because LPHOs and staff understood community-level nuances better than state or federal representatives, announcements and orders could be adjusted to best reach local audiences. MDHHS applauded LHDs' discernment and communication with state officials when they enacted different or more specific orders than the state.

Local partners, including hospitals and healthcare systems, pharmacies, schools and universities, business leaders, and others, collaborated with LHDs to promote orders and implement guidance specific to their organizations. Some interviewees described receiving support with information dissemination from local businesses, places of worship, jails and youth detention centers, and long-term care facilities. These partners took action to adhere to COVID-19 orders and then acted as trusted sources of information within their respective communities. This strengthened LHDs' outreach, improved their credibility in those communities, and deepened their relationships with community partners. Older adult services representatives said the opportunity to have ongoing conversations and collaboration with LHDs allowed long-term care facilities to set up separate COVID-19 recovery centers for older adults to protect at-risk residents from COVID-19.

> "People in the field representing health departments were great. They were understanding and weren't threatening unless you were in denial of guidance. Those that were helping operators were great, but top-level bureaucracy made [enacting guidance] challenging." —Business representative

Challenges

The decentralized nature of Michigan's public health system, with multiple layers of authority between MDHHS and LHDs, often led to confusion over which entity should lead response efforts and who had the authority to create and enforce public health orders. With little known about how COVID-19 spread at first and how best to respond, along with the uncertainty over who was responsible for creating and enforcing orders, the lack of coordination between the state and LHDs contributed to a breakdown of trust between them and contributed to challenging and disjointed implementation and enforcement of orders.

Limited MDHHS Guidance

Many interviewees asserted that MDHHS did not consistently offer guidance on pandemic-related orders issued by the federal government or the State of Michigan. They said the department often did not respond to LHDs' or other organizations' requests for clarity on written orders. While MDHHS officials attributed this to limited staff capacity, other interviewees viewed their silence as a response to potential liability issues. In other words, in the face of uncertainty, they believed the State chose not to issue any

guidance rather than the "wrong" guidance. Some interviewees suggested the Flint water crisis heavily influenced state officials' views on how to offer guidance. Other interviewees attributed these communication breakdowns to gradually decreasing institutional knowledge within MDHHS, in part due to frequent leadership turnover.

Some LHD staff said the lack of guidance from MDHHS led to lack of support from MDHHS. They said the department would sometimes disagree with and stop measures from being implemented at the local level even when they had not provided direction on approved approaches. And sometimes, the measures being prevented from going into effect in one region had already been implemented in other regions without MDHHS approval. LHD staff shared that while they provided notifications to MDHHS when they were issuing new or localized orders, they ultimately deferred to their own legal counsel rather than MDHHS.

Local Public Health Expertise Undervalued

LPHOs indicated feeling that local public health's expertise was not valued or represented in Michigan's broader pandemic response and attributed this to many MDHHS staff not having experience working at the local level. Many interviewees also asserted that information did not flow well or timely from the state to local public health, which limited how local expertise could be leveraged in decision making.

Some LHD staff asserted that instead of sharing information with LHDs, MDHHS communicated to other state agencies first, despite LHDs being on the front line of pandemic response. LPHOs alleged that MDHHS feared LHDs leaking information early if they were made aware of impending orders or other changes to COVID-19 protocol. MDHHS staff confirmed this, stating that federal officials sometimes requested that information be kept confidential until it could be rolled out from the top down.

> "We felt so frustrated that things weren't being filtered to LHDs first. Our medical director would say they'll hear about updates on CNN." —LHD staff

> "The state didn't trust our LHDs during this process in many capacities. People don't see the value in local public health. Over and over again, the state discounted us." —Health officer

Frequent Issuance of New Orders

COVID-19 orders changed often, especially early in the pandemic when experts were still learning about the disease, how it spread, and its incubation period. A thorough review of new or updated orders could take hours in addition to time needed to meet with the appropriate staff to carry out the order and develop a plan to share accessible, updated information with the public.

> "It's very difficult from start to finish when you have federal orders; then it takes the state a while to create orders that are similar but slightly different, then eventually a more local flavor . . . it's sort of like swimming through quicksand." —Older adult services representative

During the pandemic, LHD staff advocated for MDHHS to implement at least a 24-hour-notice window for future public health orders to provide uniform messaging to LHDs and ensure that all levels of public health would be on the same page when issuing guidance. Unfortunately, MDHHS often received announcements about new orders from the CDC at the same time as LHDs, which meant that MDHHS could not prepare to implement orders or develop messaging strategies any faster than their local counterparts.

> "[Notice to changes in guidance] varied at times. The CDC or MDHHS would announce, we would watch it on the news, and we would have to react that day or the next morning with no guidance. On the CDC side, [the process] never really got better. MDHHS would say, 'CDC is working on updating school/quarantine guidance.' [LHDs] never knew ahead of time when that would happen or what it would look like." —Health officer

An older adult services representative explained that "efforts to be so responsive created a lot of issues," especially the time required for each individual organization (LHDs and community partners) to do their own investigative work and then issue guidance independent of state confirmation or messaging.

> "LHDs were required to make a decision and then hope they didn't contradict the State." —Health officer

With such limited time, typical checks in the process were rushed or missed completely. One business representative noted that guidance sometimes contradicted existing laws, such as how to wear and replace gloves as a food service employee. Many interviewees shared regret that announcements had to be made so quickly, acknowledging that "making the time to meet and think through" a plan would have been better in the long run than retracting and rewriting and reissuing orders.

> "Ohio was on its fifth order when Michigan released [what felt like] its 75th. They should have slowed down and taken time to issue solid advice." —Business representative

Lack of Uniformity in Implementation of Orders

Due in part to confusion over which entities were responsible for creating and implementing orders, local organizational partners viewed LHDs' COVID-19 response as inconsistent. One older adult services representative described how certain LHDs such as the Detroit Health Department chose to enforce more stringent testing than either the state or CDC required at the time, which made for overly cumbersome and confusing protocols for healthcare entities. Another older adult services representative expressed frustration about overburdened staff having to navigate various orders and negotiate with multiple partners, arguing that guidance could have been better coordinated, which could benefit vulnerable consumers.

Inconsistent Enforcement

According to interviewees, order enforcement was the least successful aspect of implementing COVID-19 orders, and possibly the least successful aspect of the COVID-19 response overall. Because Michigan's PHC does not offer guidance for enforcement of policies, state messaging around enforcement was inconsistent and enforcement approaches were difficult for LHDs to explain to the public.

The governor's executive orders and the MDHHS director's orders routinely included authorization for enforcement by LHDs and for direct authorizations for specific enforcement activities related to the order (MDHHS April 2020). As a result, the responsibility for enforcement of COVID-19 orders was so broad it became unclear under what authority an enforcement action should be initiated, and who ultimately had authority for determining the specific action.

> "People who were working with LPH in the field were outstanding—but they also said, 'I don't have an answer for you.' They were winging it or equally frustrated with the inconsistency and lack of guidance." —Business representative

LPHOs described the significant amount of time LHD staff spent providing guidance to the public as well as schools, businesses, healthcare providers, and others on how enforcement was to be carried out. Orders were subsequently enforced differently across jurisdictions, partially due to gaps in guidance, and politicization, law enforcement's willingness to carry out enforcement, and the focus on reopening Michigan's economy. Several LPHOs and LHD staff suggested how some local governments prioritized "keeping the economy rolling" over the health and safety of residents by striving to keep businesses open despite the health risks.

Required Versus Recommended Actions

While most orders early on clearly indicated required actions, a combination of lawsuits, court rulings, sheriff declarations, and rule-following fatigue created a lack of clarity around what could or would be enforced. Several interviewees across stakeholder type highlighted the confusion that occurred at the local level in trying to decipher whether guidance was required or simply recommended. Many felt that enforcement actions did not have support unless orders indicated requirements to be followed. Mere recommendations could easily be challenged and overridden, which not only wasted LHDs' and their partners' time, but further undermined their credibility.

> "Is it protocol or guidance? The terms became difficult." —Health officer

School representatives described superintendents saying, "If this is just a recommendation, we don't have to do it, because there was so much [public] pressure [to roll back orders]." LPHOs and school representatives alike confirmed that in communities with strong opposition to more stringent rules, county governments and school boards often changed or retracted guidance altogether if they could not prove it was required to be followed.

From local partners' perspectives, LHDs gradually stopped acting on their enforcement authority as the pandemic continued due to a surge in political and public backlash against stricter orders. Some partners felt as though LHDs passed the buck on enforcement, leaving hospitals, schools, and businesses to make public health-related decisions they were not equipped to create or enforce.

> "We felt like sometimes LHDs forced us to make decisions. Our lawyers would say, 'If it's "recommended," we could have liability there.' We were put in a position to make health decisions." —School representative

Lack of Interagency Relationships

Enforcement efforts lacked coordination due to nonexistent or insufficient relationships—for example, multiple interviewees described inadequate communication infrastructure within MDHHS, claiming that the state emergency response team organized under MSP was siloed away from experts specializing in

public health crises. Without infrastructure in place to meaningfully connect law enforcement and emergency response representatives with their MSP and disease prevention counterparts at the state level, enforcement guidance was not consistent or uniformly shared.

This resulted in inaction because LHDs did not have support when orders conflicted or were not clear. MDHHS staff said "the state [didn't] have capacity to do enforcement;" thus, enforcement was a local issue. Though Michigan Department of Agriculture and Rural Development (MDARD) oversees restaurant regulation in Michigan, their agency was not included in decision making conversations at the state level, an action some business and law enforcement leaders attributed to the SEOC undervaluing their expertise. This led to some existing state law violations and caused local partners like restaurants and other businesses to question enforcement legitimacy without MDARD's supervision or input.

Lack of Law Enforcement Support

Severe public pressure related to COVID-19 and its rule enforcement led some law enforcement officers—namely sheriffs—to oppose LHDs' actions and to not support enforcement activities. LHD staff were left to manage most enforcement activities on their own, without support from MDHHS or law enforcement. LHD staff described experiencing a sharp decrease in order compliance from the public when the "state stopped taking a stand" on enforcement efforts, leaving LHDs to do the enforcement or rescind orders.

> "We talked [to the sheriff and judge] and said, 'We have the pandemic response plan, you approved the plan, you know your role, and you know a health officer order is lawful. So, you need to enforce the order.' And they said, 'Don't bring us orders; we will not support them.'" —Former health officer

> "Our pandemic planning has been based on public health having a legal authority . . . we never planned on people not following our authority." —LHD staff

The lack of law enforcement and state support left some LHD staff feeling unsafe to do their job, to interact with community members, and to live their regular lives. One LPHO shared that when their LHD enacted orders more stringent than neighboring communities', they suffered personalized attacks questioning their ability to do their job, which they ultimately lost due to "relentless" calls for their firing. MDHHS and LHD representatives shared a few instances in which law enforcement declined to respond to incidents where LHD staff were threatened by members of the public for attempting to enforce COVID-19 orders.

> "Sheriffs didn't want to step in; at one point, neither did state police jump in. [They] left the brunt to health officers." —MDHHS staff

A representative for Michigan's sheriffs described confusion over law enforcement's authority. They asserted that the state did not involve sheriffs in decision making conversations, but that interagency communication is key for developing procedures that work in urban areas like Wayne County as well as rural Keweenaw County in the upper peninsula. Some orders, they said, were unenforceable according to Michigan or constitutional rights, and law enforcement erred on the side of what some described as "lax enforcement." The sheriff's representative explained that many orders were local and county

responsibility, never state police. They added that sheriffs received state funding for PPE and test kits, but never anything to support enforcement.

> "You forget that public health officers are members of local communities—[they're] not trying to just enforce an order, but they have to live in those communities." —MDHHS staff

Contact Tracing and Case Investigation

Background

Investigating the causes of disease, especially epidemics, is a key function of local public health, and one of its mandates under the PHC (Michigan Legislature 1978h). Administrative rules adopted by the department in 1993 provide additional authority and direction for collecting data and responding to outbreaks.

Under these rules, physicians, laboratories, schools, daycares, and camps are required to report any known or suspected cases of a serious communicable disease to the LHD within 24 hours of the confirmation or reasonable suspicion. Within 24 hours of receiving the information, the LHD must report the information to MDHHS (MDCH 2020). The LHD must also, as necessary, initiate an investigation into the situation, including contact tracing—identifying individuals who may have been exposed to the disease by people with a confirmed diagnosis (MDCH 2020). The rules also require physicians, LPHOs, or school officials to arrange for appropriate precautions against the spread of the disease, including treatment and isolation (MDCH 2020).

What Went Well

Interview and discussion group participants said experience from previous public health emergencies and existing emergency preparedness plans, as well as the willingness of LHD staff to fill personnel gaps, were critical to contact tracing and case investigation efforts.

Previous Experience and Emergency Preparedness Plans

Many LPHOs and LHD staff agreed that previous experience addressing infectious disease outbreaks helped prepare LHDs to begin contact tracing. LPHOs noted that their experiences with H1N1, Ebola, Zika, and influenza helped them explain investigation and contact tracing protocols to staff and set planning tasks in motion.

Public Health Staff Filled in Gaps to Manage Contact Tracing Efforts

Many interviewees celebrated public health staff for stepping up to fill capacity gaps, specifically related to contact tracing. Most LPHOs applauded the thorough, exhaustive work of their staff to continue conducting case investigations throughout the pandemic.

> "As far as case investigation and contact tracing, [we had] top-tier staff. They stepped up and carried a lot of that load." —Health officer

MDHHS officials agreed with this assessment, sharing that LHDs' data sharing enabled state staff to review and compare follow-up times across jurisdictions. State staff were then able to divert aid to underperforming LHDs to support the influx of case investigation tasks during times of high infection rates.

Challenges

Contact tracing and case investigation faced several challenges throughout the pandemic. Interview and discussion participants pointed to inadequate and inconsistent data collection systems, unrealistic time frames for conducting contact tracing, limited staff capacity, inadequate public messaging and communication, and public weariness of contact tracing and the pandemic in general.

Inadequate and Inconsistent Data Collection Systems

LHD representatives and healthcare providers alike expressed their appreciation for existing databases, such as the Outbreak Management System and Michigan Disease Surveillance System (MDSS), which allowed COVID-19 information to be circulated instantaneously. However, many asserted that these systems are outdated, not user friendly, and do not coordinate well with other statewide systems, like the Michigan Care Improvement Registry (MCIR).

Outdated and Incomplete Gender, Race, and Ethnicity Data Categories

LPHOs described outdated gender and race demographic categories in the data systems that could contribute to missing disparities in cases and vaccination rates. One interviewee explained that the male/female/transgender options available in MDSS do not exist in MCIR. Other interviewees noted cases in which individuals marked "other" for race, though these individuals identified as American Eskimo or Pacific Islander, which are accepted race identifiers by the U.S. Census Bureau. Another interviewee described individuals marked as "other" who were of Hispanic ethnicity, who do not identify as white or Black.

Time-consuming Software Updates and Data Uploads

In addition to software challenges, the time required for staff to update information in the databases was far greater than the time available. LHD staff described having to "take turns" uploading information due to limited software licenses. Because data reporting took so long, staff sometimes worked through lunch or uploaded data outside traditional work hours. One interviewee recalled entering data at 4:00 AM to keep up with data entry needs. Other LHD staff members described the difficulty of centralizing data entry and uploading because it was hard to keep track of who was responsible for uploading which case data "with so many spreadsheets operating in tandem."

One LHD staff member explained that tracers monitored the test result queue "24/7" to flag positive COVID-19 cases and alert all their potential and confirmed points of contact as quickly as possible. They and others noted that there were many different, sometimes competing, systems to track which staff were working on which cases and to confirm how many contacts had been successfully reached. The same information was often entered into multiple data systems.

Delays in Test Results

Communication challenges between the state, LHDs, and partner organizations related to ordering, receiving, and disseminating patients' COVID-19 test results created confusion and delayed patient care. One hospital representative shared that testing for COVID-19 variants was done at the state lab, where it

could take between ten days and two weeks to receive results, but these results went to the LHD instead of to the healthcare provider that ordered the test. However, healthcare providers' patients lived across multiple LHD jurisdictions, so the lag was compounded by healthcare providers assessing which LHD held jurisdiction for each test and then individually requesting results from the LHDs.

Unrealistic Contact Tracing Time Frames

In May 2020, as COVID-19 caseloads in Michigan increased dramatically, MDHHS issued new, more aggressive requirements for initiating and completing case investigations, requiring that 90 percent of confirmed cases have an attempted interview and 75 percent have a completed interview within one day of receiving a referral. According to a memo issued by MDHHS at the time, the metrics and monitoring were implemented "in an ongoing effort to ensure that LHDs are receiving the resource support that they need to facilitate local action as part of a broader statewide strategic response" (MDHHS May 2020).

More positive COVID-19 cases meant more contacts to trace. Extreme tracing demands left LHD staff scrambling to contact multitudes of people exposed, or possibly exposed, within the stated guidance. Some LHDs—depending on their staffing capacity and the number of cases in their region—would prioritize which populations they contacted within the 24-hour contact tracing window, such as those over 65 or others vulnerable to severe health risks.

> "Our staff were upset if we missed out on people. Cases were so overwhelming that we couldn't call everyone." —Health officer

High Testing Volumes

Hospital representatives asserted that current public health and healthcare systems are not structured to conduct the volume of tracing that COVID-19 eventually required. LPHOs described how tracing demands became more unwieldy once schools reopened following lockdown. Though schools were thorough in developing and sharing contact lists, it was difficult and sometimes impossible for LHD staff to reach out to a classroom's worth of families by that evening to avoid further exposure the next day.

> "With school cases, [they were] good about sending us a list of contacts, but sometimes not until 7:00, 8:00, or 9:00 at night. We were scrambling to call 20, 40 families to keep kids out of school the next day." —Health officer

Time-consuming Contact Tracing Calls

Many participants did not feel that tracing processes were updated to account for the amount of time required to handle individual calls, which exacerbated contact tracing challenges during times with high infection rates. Examples of questions that contact tracers and other LHD staff addressed included whether people who tested positive for COVID-19 were allowed to refuel their car at a gas station since they would touch the gas pump, whether they needed to quarantine in a hotel away from other members of their household, and how they could access food while quarantined. Responses to these questions often required complex problem solving and lengthy conversations. In addition, when tracers and other LHD staff had limited guidance to follow, they relied on their own knowledge and expertise to provide individualized direction and instruction.

> "[We] took guidance that existed and [experienced a] lot of gray area. There was nothing to go back to in emergency preparedness planning—each situation was unique." —Health officer

LHDs and long-term care facilities (LTCFs) were evaluated on the speed with which their staff conducted case investigations. While several iterations of tracing systems—first Qualtrics, then TraceForce, finally Patient Education Genius—streamlined data input processes, the administrative burden, time needed to provide patient support, and time spent contact tracing contributed to frustration and decreased morale among LTCF and LHD staff. LTCF staff explained that strict timelines for uploading patient information did not account for the laborious and often devastating work of managing patient care in real time. LHD staff were also responsible for coordinating COVID-19 treatment navigation, as needed, to help community members receive COVID-19 care.

> "The time that our staff spent sitting on the floor answering calls, passing water [to each other], sitting at someone's bedside while they passed away . . . ridiculing us about how many deaths we had didn't seem fair." —Older adult services representative

Limited Staff Capacity

While many LHDs had long struggled with staffing prior to COVID-19—due in part to longstanding underfunding of public health—the pandemic exacerbated the issue. Even after LHDs repurposed staff to do contact tracing, many struggled to keep up with the ever-increasing case numbers. Some LHDs contracted case investigations out to MDHHS or the CDC Foundation to relieve staffing pressures. Hospital representatives shared that relying on staff unfamiliar with local norms and establishments sometimes meant contact tracing was not as efficient or effective as it could have been. The longer each individual conversation takes, the fewer conversations that could take place on any given day.

> "[When] talking to someone who didn't know you . . . they asked the right questions, but it was better when done by a local county person who knew the locations of schools and restaurants. They [sometimes] didn't know what you were talking about." —Hospital representative

While some LPHOs shared their appreciation for the TraceForce team at MDHHS and staff from the CDC Foundation who provided additional case investigation capacity to LHDs, many LHD staff felt that state and federal aid came "a day late and a dollar short." They said the support sometimes missed peak case windows, leaving little for these supplemental staff to do. Thus, training these new staff sometimes felt like more of a burden than a helpful respite for LHD staff.

Challenges Training New Staff

While LHDs were relieved to have additional staff to conduct case investigations, the time and resources needed to prepare new hires to complete tracing tasks thoroughly, efficiently, and thoughtfully was challenging for staff already stretched thin. Some of the nuances and historical knowledge that could support successfully gathering vital information related to public health crises were difficult to pass on to new staff. With the expectation that so many people be contacted in a small window of time, questions around quality in tracing efforts arose, especially during peak case times, and some LHD staff questioned whether they were trained enough to ensure the best outcomes.

> "Reeducating staff, including a number of temporary employees, [was a] lot of work—with shortcut after shortcut, [people were] getting less training. Are you really [producing] the best output? We worry about customer experience, feeling like their needs are being met—it's hard to teach that." —LHD staff

If guidance changed, tracers might make slight adjustments to local case investigation procedures, which then needed to be communicated to all staff supporting tracing efforts. Since many tracers were temporary employees, updating the tracers on new guidance was often accompanied by confusion and delays. LHD staff used video tutorials to quickly onboard remote workers, but updating these videos with new guidance instead of Word documents was exhausting and time-consuming.

> "I did so many training videos for staff. Once I did them, they changed the next day." —LHD staff

Schools Supplemented School-based Tracing Efforts

Timely and properly completed case investigation was difficult for smaller LHDs to manage when the focus shifted to school-age children and young adults. School representatives noted that schools either repurposed existing, or hired new, administrative staff to support contact tracing efforts to keep kids in school and, in turn, keep schools open. Students, their families, and teachers all struggled to identify whether exposures necessitated keeping kids at home to learn virtually instead of in person. Like LHD staff, school administrative staff became burnt out on this task. Constant meetings were needed to interpret changes in guidance and quickly disseminate that information to all contact tracers.

> "All schools were supporting LHDs. Basically, what building-level admins were doing became the largest part of their job. Local public health isn't staffed for that type of need." —School representative

Inadequate Public Messaging and Communication

Contact tracing efforts were made more difficult by a lack of coordinated and clear messaging about the data being shared with the public. Several LPHOs expressed their frustration with the lack of coordinated messaging around contact tracing and quarantining protocols, advocating for a strategy shift sooner in the pandemic. One LPHO explained that after so many months, the narrative around quarantining should have mirrored that of other widespread respiratory illnesses, which do not employ mass quarantine measures. This missed opportunity to frame COVID-19 as a serious, but preventable, seasonal respiratory illness contributed to fearmongering and perceived shaming of people who tested positive. Testing every possible case and implementing a zero-tolerance policy for COVID-19 infection did not help lessen people's fear of contracting the illness or their mistrust about preventive measures.

> "By the time we're dealing with hundreds of cases per week, any model dealing with quarantining [becomes overwhelming]—we can't isolate around this anymore." —Health officer

Unique Challenges in Small Communities

Though close-knit community connections could make contact tracing more efficient when tracers were familiar with tracing subjects' everyday activities and people they came in contact with, it could be difficult to maintain confidentiality. In small and mid-size communities, some LHD staff shared that fear

and stigma of positive COVID-19 test results could create issues. Volunteers and sanitarians were at times threatened by community members they knew because some call recipients wanted to avoid tracers sharing their information, and their status related to COVID-19, with others they may know in the community.

> "Staff were getting to a breaking point and had to transition [to another position/task] due to the abuse they were taking." —Health officer

Community Weariness

Though initial responses to contact tracing calls were strong, the immediate shock of contracting COVID-19 dwindled as the pandemic wore on. The public, including parents of school-aged children, grew frustrated with both the major and minor inconveniences of possibly being exposed to COVID-19. LHD staff shared that community members screened calls from LHDs or told LHD staff "they didn't care unless [LHD staff] were telling the schools." As contact tracing efforts became a part of life, the calls from LHDs were seen by some parents as a disruption to their children's school routine, which was continuously plagued by uncertainty throughout the pandemic. School representatives shared that students were often forced to miss days of in-person learning due to instances of close contact, despite some students never being sick themselves. Greater access to COVID-19 tests later on in the pandemic meant that parents could confirm whether their child had contracted COVID-19, which alleviated feelings of "arbitrary" decision making posed by contact tracing efforts alone.

Further, both community members' and tracers' feelings of futility grew as the pandemic continued. Opinions about the validity of COVID-19 and the effectiveness of mitigation strategies wore down tracers and affected retention of LHD staff. One LHD staff member described how "talking to someone who's supposed to be in quarantine and hearing their [car's] blinker" made tracing efforts feel useless, and that mitigation strategies were futile if people weren't going to follow recommended procedures.

Distributing and Administering Vaccines

Background

In addition to directly providing vaccines to both children and adults, LHDs are involved in assisting and monitoring other providers' compliance with state and federal requirements for vaccine administration. Typically, providers participating in federally subsidized, free vaccine distribution programs receive vaccines directly from the federal government; other vaccines are received from the manufacturer. LHDs ensure that providers are enrolled in the necessary federal programs and review administration and inventory reports completed by providers. LHDs are accountable to MDHHS for reporting the number of vaccine doses administered within their jurisdiction. They also monitor sites' proper storage and handling of vaccines, information dissemination, posting of required information, and record-keeping. If a provider is unable to use a vaccine prior to its expiration date, the LHD is required to obtain the soon-to-expire vaccine and use it within their own clinic or redistribute it to another clinic within their jurisdiction. LHDs also disseminate immunization information and updates, and provide ongoing education to providers, their staff, and the public (MDHHS n.d.c).

The COVID-19 vaccine was initially allocated to states based on total population, and states oversaw distribution to LHDs, health systems, and other providers. Although the CDC had released federal recommendations for allocating COVID-19 vaccine supplies, it was up to state governments to determine

vaccination eligibility criteria and how to distribute the available doses within their states (Wagner, Slack, and Bajak 2020). In February 2021, new federal allocation and distribution strategies were put in place to address priority populations and equity concerns. Michigan priorities, or tiers, were adopted to follow the CDC recommendations (MDHHS April 2021). Around this time, the federal government and the State began to distribute doses to retail locations, as well as to traditional healthcare providers.

What Went Well

Many interviewees regarded planning and implementing vaccine distribution and administration initiatives as the most coordinated, proactive, successful element of the COVID-19 response. LHDs used previously established protocols to guide their vaccination efforts. While racial inequities in distribution and administration persisted, especially in Michigan's urban areas, LHDs intentionally and successfully targeted vulnerable populations to increase vaccine uptake and reduce hesitancy.

Historical Experience, Existing Protocols, and Innovative Solutions

Due to existing protocols for vaccine storage and administration, LHDs quickly established COVID-19 testing and vaccination sites. These protocols supported coordination with local partners for launching mass vaccination sites, which many LPHOs agreed was where local public health shone. MDHHS attributed the overwhelmingly positive response to, and uptake of, COVID-19 vaccination at locations like Ford Field in Detroit and the DeVos Place in Grand Rapids to "the groundwork local public health laid out . . . on a scale never expected [to be needed]."

Some LPHOs underscored the importance of inventive problem-solving through new service delivery methods. They developed drive-up services for testing and vaccination. LHDs repurposed existing testing and vaccination facilities for COVID-19 to accelerate rollout and increase uptake of those services. Through MDHHS funding, one LHD shared they had transitioned equipment previously used to test for water quality into COVID-19 testing equipment, which increased their testing capacity. Interviewees shared that creating new delivery methods also spurred improvements to some LHDs' intake process, streamlining the testing and vaccination processes by foregoing extensive, time-consuming enrollment paperwork. Ultimately, streamlined processes benefited vulnerable community members who might have struggled to access these services otherwise.

> "Vaccine clinics were the light at the end of the tunnel. When we got vaccines in, we used our plans—this was our bread and butter. The public were surprised at how well we facilitated vaccine clinics because they didn't know that's what we do."
> —Health officer

Dedicated Staff and Excellent Public Service

LPHOs celebrated their staff for continuously providing thoughtful, supportive customer service throughout the pandemic. LPHOs praised staff for guiding community members through decisions about getting vaccinated without judging their fears. One LPHO commented that "many [people] working in public health could go [work in] private healthcare . . . and make a lot more money," but instead, many LHD staff chose to "do whatever [LHDs] needed," including working long hours at 24-hour clinics, sometimes seven days per week. LPHOs further emphasized the risk LHD staff were exposed to, adding that staff volunteered to administer tests and vaccines to homebound Michiganders, adults in congregate care facilities, and mass vaccination clinics.

> "Customer service was great. People were treated as a person, not a number in a mass vaccine clinic." —Health officer

Strong Partners and Volunteers

Many LPHOs indicated that collaborating with partners like federally qualified health centers, local faith leaders, and schools contributed to successful, efficient mass vaccine clinics. Others mentioned the importance of developing strong nontraditional partnerships, including public transportation entities, who LPHOs credited with helping to transport people to vaccination clinics. United Ways around the state helped fund marketing, food, and incentives at community vaccination locations.

Much of this successful coordination was due to established communication channels and relationships between local agencies. Frequent interorganizational calls between local partners helped to establish familiarity and trust between organizational leadership, benefiting constituents who needed vaccinations.

Organizational partners, healthcare professionals, and community members signed up to volunteer to help with vaccinations, with some LPHOs noting that their medical reserve corps "grew exponentially" due to a "tremendous outpouring of people in the community volunteering their time." According to interviewees, volunteers from within health systems helped make mass vaccination clinics possible. In one example in west Michigan, volunteer capacity enabled LHDs and hospitals to administer 40,000 vaccines per day during peak vaccination periods.

Increasing Vaccine Uptake and Reducing Hesitancy

Through strong relationships with leaders and trusted information sources in underserved and vulnerable communities, LHDs successfully increased vaccine uptake and reduced hesitancy. MDHHS created groups focused on reaching racial and ethnic minorities as well as veterans, people with disabilities, and older adults. Each group was tasked with identifying the barriers people in their populations might face getting vaccinated and gathering input from community members on potential solutions.

The group serving older adults and people with limited mobility developed a strategy for homebound Michiganders and developed neighborhood testing sites based on the social mobility index and disparity statistics. These sites were multipurpose, with both testing and vaccination services, as a way to offer efficiency and education to people with mobility challenges and other potential social determinants of health that may impact access to health interventions.

To address some transportation issues, public health and healthcare system partners worked together on ways to vaccinate people in their homes. One older adult services representative described collaborating with a local independent pharmacy to administer at-home vaccines when health systems in the region were unable to provide mobile vaccination due to capacity issues. Another described how adult foster care and assisted living facilities shared patient information with nearby LHDs and hospital systems, which could then provide other healthcare services in-home, keeping homebound patients safer and healthier by ensuring they stay out of hospitals.

Undervaccinated or vaccine-hesitant populations felt more comfortable accessing vaccines in their own communities and at familiar, trusted locations. Thus, hospital and LHD representatives partnered with faith and community organizations, sometimes setting up events or booths at community potlucks or food banks. LPHOs in southeast Michigan noted this approach was especially helpful in conducting outreach with Black or African-American and Arab-American populations. These types of community locations

were also successful in reaching more rural populations, who had more limited vaccination locations and, in some cases, significant transportation barriers.

The lieutenant governor's Racial Disparities Task Force, which was one of several pilot projects helping to ensure equitable vaccine distribution, combined LHDs' data reporting and U.S. Census tract data to inform where to focus vaccination efforts.

Strong Federal and State Support

The elements of vaccine distribution and administration that proved most successful were supported by state and federal efforts to push the COVID-19 vaccine, including communications, data sharing, and funding. LPHOs agreed that Michigan "geared up quickly as a state," partially attributing the rapid mobilization of vaccine supply to clear immunization program protocols that were broadly understood and correctly followed. One LPHO noted that MDHHS and the governor's office were responsive in addressing potential challenges like unrealistic distribution deadlines and how to manage increased public demand despite limited LHD capacity during the holidays.

With the Federal Retail Pharmacy Program, hospital representatives praised strong coordination "with all retail pharmacies within the White House partnership," and noted that VaccineFinder enabled federal partners to understand the connection between vaccine distribution and administration efforts (The White House 2021). It also helped that federal funding had started to flow ahead of vaccine distribution efforts. LPHOs explained that state and federal representatives regularly updated storage, handling, and transportation requirements and informed LHDs as early as possible.

Challenges

Despite an overwhelmingly positive, efficient, and effective vaccination rollout, LHDs still faced difficulties communicating the distribution plan to the public, setting up wait list technology to manage the initial public demand for vaccines, and combating misinformation and vaccine hesitancy.

Inconsistent coordination between MDHHS and LHDs, as well as healthcare and other local organizations, led to distribution setbacks. At times, efforts to quickly distribute vaccines outweighed careful planning and coordinated messaging, which affected how protocol changes were explained to the public. Interviewees shared their frustration over the perceived lack of coordination between organizational partners and emphasized the need for more conversations about equitable distribution to support vulnerable populations.

Disruption of Typical Vaccine Distribution Responsibilities

Confusion about responsibility for vaccine distribution was a significant and recurring challenge for LHDs throughout the pandemic. Though LHDs usually lead vaccine distribution strategies for disease outbreaks, some hospitals and pharmacies received COVID-19 vaccine shipments from MDHHS ahead of LHDs. One LPHO described how the state followed informal priority lists based on whether healthcare partners—including hospitals, pharmacies, and primary care practices—requested vaccine doses. According to LPHOs, prioritization seemed arbitrary and not based on organizational capacity or assurance they would collaborate with partners to distribute the vaccine according to the state-approved tier system.

This break in the typical flow of resources and information, along with limited communication from MDHHS regarding its distribution strategy and intense demand for a vaccine with a short shelf life, led healthcare partners to make decisions about vaccine distribution without consulting LHDs. Confusion over decision-making authority created competition between organizations who were then vying for vaccines to provide to their patients rather than collaborating and sharing resources.

> "Some vaccine was going directly to hospitals early on, not to LHDs. We had no control over who was getting vaccinated or not." —Health officer

Unclear Eligibility and Rapid Expansion of Eligibility

When vaccines first became available, the Whitmer administration established priority populations for receiving early doses—essential workers and older adults (LEO n.d.). LHD staff noted that communication about eligibility criteria was either nonexistent or unclear and often came too late to be helpful. They said the little guidance from MDHHS made it difficult to know which professions were included as essential workers and they were unsure how to assess eligibility. Without guidance, LHD staff interpreted guidelines to the best of their ability, which sometimes led to public frustration.

LHDs also grappled with rapid and unexpected changes to eligibility tiers, which were difficult to explain to the public when LHD staff did not have much warning or reasoning for each change. LPHOs expressed frustration when recalling their attempts to vaccinate essential workers when the governor expanded eligibility to adults over 65 after just two weeks. Though state leadership felt public health was ready for this eligibility expansion, LPHOs explained that LHDs did not have the doses to meet greater demand, nor were the first priority groups fully vaccinated yet. Vaccinating Michigan's older adult population necessitated 700 to 800 additional doses per week in most communities, more than LHDs were receiving initially.

> "Healthcare providers were calling [us], asking who they had to give eligibility to. Some signed the state agreement [about adhering to vaccine distribution regulations] without knowing what they agreed to." —LHD staff

One LPHO recounted the difficulty in explaining the lack of available vaccine to the influx of older adults trying to schedule their vaccination appointments. The disconnect between state messaging and the vaccine availability contributed to public mistrust of local public health officials. LHD staff described having to calm "angry and bewildered" community members desperate to receive their vaccine—while staff were left without messaging to respond to questions about vaccine logistics and scheduling.

Difficulty Establishing Hotlines, Wait Lists, and Tracking Technology

Intense demand for answers to ever-changing guidance drove the need for COVID-19 phone hotlines, as well as waitlist platforms once the vaccine became available. Initially, LHDs received—and struggled to handle—the influx of calls with questions about the vaccine's safety, efficacy, and eligibility tiers. Some LPHOs described receiving transferred phone calls from health partners because those entities did not have a process to answer community members' questions. According to LHD staff, phone calls from the public would flood their phone lines and cause some LHD phone systems to shut down entirely.

Many LHDs used Microsoft Excel to manage vaccine registration information while they developed formal registration software. Some LPHOs wanted a centralized registry with outreach targets, but others felt vaccine registration was pointless and should not have been attempted with so few doses available.

> "Registration for vaccine administration should not have been done—there's no way to organize 40,000 people and only 900 doses." —Health officer

Inequities in Vaccination Efforts

Many interview and discussion participants acknowledged that white, insured community members had a higher likelihood of being vaccinated than their Black, Brown, and uninsured neighbors. They attributed this, in part, to general vaccine hesitancy among minority populations and noted that people with insurance are likely to be able to navigate the healthcare system.

Addressing the challenges associated with vaccine hesitancy and lack of familiarity with the healthcare system was essential to ensuring vaccines reached those at highest risk for COVID-19. However, targeted efforts, such as the community-based, door-to-door campaigns led by LHDs, take a lot of time to plan and implement. By the time LHDs were implementing efforts to reach communities of color, they had lost time to prevent further COVID-19 spread in these communities. One LPHO described local public health as "running around the community to make sure we were reaching the right populations, doing more intensive outreach on a smaller, more targeted scale."

> "[It was most] important to get vaccines into the arms of those most at risk. That takes on a different meaning knowing what we do now about the pandemic and the vaccine." —LHD staff

While the state provided guidance on who to prioritize for vaccination, many public health representatives asserted that hospitals and health systems administered vaccines to local leaders, hospital leadership, and staff members ahead of vulnerable patients who would have benefited from early doses. One LPHO suggested that hospitals "quickly lost interest in immunizations," and that public health staff had to push them to keep mass community vaccination sites open. LHD leaders expressed frustration that health partners like hospitals and pharmacies did not lead efforts or even partner with LHDs or conduct outreach to vulnerable communities, leaving LHDs to shoulder the burden.

> "The state told [distributors] 'you have to distribute 90 percent of doses,' so the hospitals . . . just [focused on] get[ting] doses in arms—but it matters whose arms they go in." —Health officer

Geographic Challenges

The lack of clarity around eligibility criteria also meant that implementation of guidance was inconsistent across the state. Neighboring LHDs and health systems on county and state borders appeared to follow and enforce eligibility tiers differently, in part due to a lack of guidance for vaccinating community members who live and work across county or state lines. Limited vaccine supply forced many distributors to "follow a regimented script" to confirm eligibility, including figuring out people's work and living situations across county and state borders. The lack of a centralized mechanism to streamline messaging and consistently implement guidance fueled public confusion.

Interviewees serving Michigan's rural and midsize regions felt neglected compared to larger urban areas receiving vaccine supply. Conversely, because less populous counties were able to vaccinate people more quickly than counties with large populations, people in larger counties would sometimes get vaccinated in rural counties. This created problems for some larger counties because they were expected to vaccinate a

certain number of people in an eligibility tier before using vaccines for newly eligible populations. Thus, they were unable to begin vaccinating additional populations until they had used the number of doses meant for the higher-priority population.

LHDs serving less populated, more rural areas faced challenges in finding locations big enough to host mass vaccination events and to accommodate a large influx for parking and drive-up needs. Once large enough vaccination locations were secured, LHDs struggled to find enough people to help with setup and teardown for large events. Some community members faced transportation barriers to reach those vaccine events, as popup events in rural areas did not have public transit options. LPHOs noted that vaccination data shows that those with transportation issues do not get vaccinated.

A Short Vaccine Shelf Life

Vaccine storage logistics were also difficult to manage. Smaller LHDs and pharmacies are not typically equipped with large-capacity storage, and the COVID-19 vaccination's short shelf life required it to be stored in freezers. This meant that some LHDs were unable to store onsite or had to secure mobile freezer units. While some LHDs or their partners had the physical space to accommodate large quantities of ultracold storage, some partners did not comply with storage protocols. One LPHO relayed how LHDs typically inspect small providers' vaccine sites when they receive federally supplied vaccine doses. In those instances, usually at pediatrician practices, LHD staff check temperature logs and confirm that storage capabilities meet federal standards. Smaller-scale pharmacies not accustomed to the influx of patients that the COVID-19 vaccine created were not prepared to store doses and were not familiar with protocols.

The short shelf life of the COVID-19 vaccine, once it is removed from the freezer, also led to challenges in estimating the number of doses that would be given in a day and determining how or whether to use the remaining doses that would otherwise be unusable. Vaccine administrators sometimes decided to vaccinate people outside of the priority populations if doses were at risk of expiring. Some LPHOs described hospitals using these doses to vaccinate their hospital board members and doctors' family members, rather than finding a way to reach eligible community members. Others noted that some LHD staff also used these doses to help their family members get vaccinated. Sometimes, however, vaccine doses went unused, as described by one older adult services representative, who said that a pharmacist in their region refused to vaccinate people who were not eligible even if that meant not using the vaccine on anyone.

> "[Transportation support] was needed equally in isolated communities and peripheral areas. Rural areas felt forgotten." —Hospital representative

Working Within the Existing Emergency Preparedness and Public Health Infrastructure

Background

The challenges described above—and to some degree the successes—were heavily influenced by the state's emergency preparedness and public health infrastructure. The decentralized structure of the state's public health system and overlapping authority granted to both state and local public health officials created a weak foundation for incident command. An already-understaffed public health system was hamstrung from the start in its ability to respond effectively and provide the services the public so desperately

needed. Outdated and seemingly inefficient data systems stymied effective communication and information sharing at all levels. Local public health in Michigan has not been fully funded for several decades—although the PHC requires that the state reimburse LHDs for 50 percent of the cost of all required services, the state has never met this obligation (Michigan Legislature 1978k; MALPH 2019). The state has increased its public health funding over the last few years, but still falls short of the 50 percent requirement.

Ineffective Incident Command Structure

Though local and state public health interviewees acknowledged that Michigan's incident command structures (i.e., the SEOC and CHECC) were technically in place at the beginning of the pandemic, most agreed that they weren't implemented to their fullest extent. A few interviewees reported that the SEOC and CHECC were implemented poorly during the pandemic and contributed to the confusion over MDHHS and LHD roles. Some said the SEOC was set up with siloed departments, which led to disjointed coordination and an unclear operations structure. Most interviewees agreed that the SEOC was too small of a body—and too overburdened because of its high-status members—to be an effective centralized location to disseminate information, especially guidance on enforcement.

Further, the SEOC is supposed to inform the CHECC, a response mechanism many interviewees assert was never properly deployed. Interviewees described the CHECC being used primarily for "reporting up" from locals to the state, but it was not good for two-way information sharing. LHDs used the CHECC to send MDHHS requests for assistance or to ask for clarification on guidance, but LPHOs explained that it could take significant time to receive guidance from the CHECC, and some LHD leadership reported being uncertain who at MDHHS to contact with questions. Interviewees also noted the CHECC reinforced silos due to separate communication channels for different entities (e.g., public health, law enforcement, MDARD, and the governor's office) with little information centralized, which hindered common understanding and collaboration.

Some LPHOs maintained that this failed coordination was avoidable—the CHECC was set up without formal, enforceable authority, which made it difficult to coordinate the National Guard and Homeland Security efforts. Some MDHHS staff confirmed this assessment, noting that there was no adequate infrastructure to direct decision making or any accountability checks to follow up on situations requiring enforcement.

> "In the preparedness response world, [we] use those principles of communication and incident command. During a pandemic impacting so many local and state agencies, [we] didn't have knowledge or visibility of incident command—that was a challenge at the local and state levels." —MDHHS staff

The state health department used both the MI Health Alert Network (MIHAN) and the CHECC to share important information from the state to LHDs and others involved in the pandemic response. MDHHS used MIHAN to share the most recent updates to guidance and discuss how to manage and mobilize elements of the response effort. Through MIHAN, the state held weekly conference calls in 2020 and 2021 that supported collaboration among LHDs, specifically around preparing informational materials for their residents. While interviewees shared differing perspectives on the state's communication consistency and success, when information was shared accessibly and in a timely manner, they said, COVID-19 prevention and mitigation measures were able to be deployed smoothly.

Inadequate Training on Emergency Protocol Implementation

State and local public health representatives shared differing perspectives about the adequacy of LHDs' training on unified incident command and the steps needed to operationalize policy decisions. While some indicated enough emergency preparedness training occurred pre-pandemic, others lamented that there hadn't been a greater focus on logistics in public health education and training materials. MDHHS staff described "overconfidence in emergency preparedness plans" without adequate training related to operationalizing and executing protocol. They explained that local public health needed a better understanding of how to implement protocol to craft timely, accessible communications aimed at legislators and local leaders as well as the public. The disconnect between public health methodology and action-oriented logistics planning contributed to mistrust of LHDs' expertise and "public health [getting] pushed to the side" in decision making situations.

> "It's one thing to be a local public health expert or director, [and] another thing to be an operational executer. I'm not sure that the public health field generally is as strong in execution, and I don't think the public health field generally is the best at succinct, clear communication." —MDHHS staff

From some MDHHS staff members' perspective, local public health did not have an adequate understanding of policy making at the state level, nor the role that public pressure played in influencing decisions. One MDHHS representative claimed LHDs were not prepared for the slow, sometimes frustrating, pace of policy change, both within the state legislature and the executive office, or for the fact that neither had the authority to "make unilateral decisions."

An older adult services representative attributed public health's misconception of state decision making to a gap in "historical perspective on preparedness planning." They noted that significant turnover in state government has resulted in a loss of understanding at the state level of the importance of maintaining and regularly exercising emergency preparedness protocol. This loss of understanding led to lower prioritization of emergency preparedness implementation training.

Equipment Shortages and Challenges

Public health and other healthcare organizations experienced shortages in personal protective equipment (PPE) and other equipment, such as infrared thermometers, that was needed for staff to respond to the pandemic. PPE may not have been adequately accounted for in emergency preparedness planning, according to some interviewees, but it was not possible to predict the scope of the pandemic and the scale of need for PPE and other equipment. Hospital partners asserted that state attempts to require hospitals to provide data about PPE and supplies were based on a poor understanding of health systems, which serve many facilities across the state and often have multiple warehouses of equipment instead of a hospital with a single storeroom. These data requests lacked an understanding of who the different hospitals were and who they served. Additionally, MDHHS did not "consider the burn rate" with which the hospitals were using the PPE, causing them to misjudge the scale needed for future shipments and to send PPE to regions that did not need it as soon as others.

Insufficient Funding

Underfunding in public health requires LHDs to rebalance and realign priorities based on available funding, which has placed a greater demand on LHDs to secure funding to address local needs through

local governmental entities, service fees, philanthropy, and grants. MDHHS staff noted that most public health funding over the last few decades has come from federal sources with little state investment.

An overreliance on external and uncertain funding can prevent LHDs from making long-term investments in public health infrastructure, including investment in comprehensive data and information systems, workforce development, and organizational capacity. A lack of infrastructure investments left LHDs in a precarious position, limiting their ability to manage an ongoing, global public health crisis, while also fulfilling ongoing obligations.

The LHD funding structure also creates inequities and inefficiencies in statewide public health programming and response as jurisdictions with greater access to local funding are more likely to have staff and resources to redirect toward an emergent issue or a PHE.

Historical underfunding across public health severely impacted LHDs' ability to respond to COVID-19 efficiently and effectively. In March 2021, partway through the pandemic, the state and federal government agencies allowed LHDs and other partners to deploy COVID-19 funds for creative solutions to address local needs. Additionally, MDHHS authorized funding flexibility in LHDs' existing resources, which allowed LHDs to fund efforts more quickly while waiting for Michigan's government and the federal government to allocate additional COVID-19 funds. LPHOs noted that this new flexibility made it easier to pay for vital program efforts like contact tracing or vaccine distribution.

Inadequate Staffing Levels

All interviewees, across stakeholder types, agreed that public health was understaffed before the pandemic and struggled to attract and retain employees throughout the pandemic to complete necessary tasks. This was due, in part, because of the lack of investment in public health. LHD staff undeniably provided a strong backbone for pandemic response efforts, but their capacity was limited to meet all that was demanded of them. During the pandemic response, LHDs reallocated some staff from their usual tasks to help LHDs complete high-volume tasks like contact tracing. LHD staff, including nurse administrators, took on new responsibilities while also completing their regular duties or they allocated these duties to others so they could focus on pandemic-related responsibilities. One LHD staff offered an example of a small group of nurses conducting educational outreach to minority communities while shifting between contact tracing and answering questions on their LHD's 24-hour hotline. Several interviewees marveled at the degree to which LHD staff were able to fill personnel gaps and achieve all that they did, despite the added demands across LHDs.

> "LHD staff are passionate about maintaining public health infrastructure and services and rallied to take on new tasks and worked long hours to provide necessary public services." —Health officer

However, with existing staff already stretched to capacity, and many LHDs holding multiple daily meetings, some LPHOs found it challenging to support all their communities, especially those in multicounty districts with varying needs. This, LPHOs noted, meant that some vital activities went undone and there were service delivery gaps.

> "We diverted staff from everywhere in the department where we could. There was a time where we had 1,000 voicemails that hadn't been answered. [We did] not have enough staff. Turnover was horrible." —Health officer

> "What our LHD needed was additional staff—the amount of workload that shifted to them was tremendous…they needed adequate support and didn't have it. [LHD staff were] asked to do so much extra work beyond the scope of their structure." —School representative

LHDs experienced significant staff burnout and turnover for myriad reasons, including mistreatment by the public. LPHOs intervened when they could to provide a break to overburdened staff—usually switching them to a different task with less public interaction, like data reporting. Public health interviewees shared stories about their and their colleagues' ongoing battles with post-traumatic stress disorder, anxiety, and depression following targeted abuse and severe local media scrutiny, which impacted some staff's job satisfaction. Despite these experiences, some LHD staff "didn't feel right jumping ship," feeling guilty about leaving their colleagues further understaffed.

Limited Public Awareness and Understanding of Public Health

Throughout the pandemic, the public consistently misunderstood the role of public health and relentlessly questioned LHDs' expertise, making it hard for LHDs to assert their local authority. Interviewees noted that most people do not know what public health is responsible for, what services it provides, and how it protects the community. As noted by an LPHO interviewee, LHDs offer a "vast array of services [that are] hard to keep track of."

> "People don't know what public health does. We're behind the scenes and don't advertise well; [they are] the same stopgap services we've always provided. Something I hear all the time—'I didn't know [LHDs] did this!'" —Health officer

Local elected officials serving on county commissions, LHD boards, and school boards also misunderstood local public health's role in the pandemic response. Beyond being uninformed about the services LHDs provide, LPHOs stated that the public is unaware of LHDs' limited resources. People, they said, were shocked that their LHD did not maintain a fully staffed call center.

> "The general public doesn't think of the LHD unless there's a crisis." —Health officer

Lack of Effective Communication to the Public

Many stakeholders agreed that the state and LHDs needed to collaborate more to help the public understand what information was important to follow and what it meant. Participants across stakeholder types communicated that misinformation about COVID-19 was detrimental to people's understanding and even acceptance of statistics related to positive cases and deaths. One older adult services representative asserted that state and federal reporting requirements emphasized the wrong aspects of the COVID-19 response, inadvertently supporting criticism of efforts being made to mitigate COVID-19's spread.

> "[There are] so many caveats to data; it's hard to think through best way to communicate how the number of cases is affecting [institutions] schools and hospitals. —LHD staff

LHD staff explained that with people so narrowly focused on the wrong parts of the data, it was difficult for LHDs to address specific instances of misinformation and develop effective communications without a coordinated plan in place. Some LHD staff, however, noted that LHDs used graphics created by MDHHS and CDC and reworked the information to be easier to understand. While they said this took a lot of time and effort, staff shared that the graphics performed well on LHD social media pages.

Challenges to Public Health Efforts and LHD Authority

Highly publicized politicization of the risks of contracting COVID-19 and the response necessary to slow its spread affected elected officials' decision making at all levels of government. MDHHS staff described how challenging it was "to engage in policy and solely rely on science," given that it felt as though every decision they made became extremely politicized. State leadership, both in government and public health, saw the results of national-level backlash, including protests and defiance of orders related to masking and found it difficult to make public health decisions. Other MDHHS representatives agreed, noting that "trusted folks were sidelined by an administration that didn't want information to go out" for fear of increased public opposition to promoting public health.

> "[At the state level,] we relied on the feds for expertise and that backstop was gone. It was hard to figure out what we went out on our own to implement versus waiting for the feds to break through [the political barriers] and do what was right." —MDHHS staff

> "Politics essentially trumped science, and it was very demoralizing for the public health workforce." —MDHHS staff

One LPHO shared that a universal misunderstanding of portions of Michigan's PHC influenced county-level authority challenges. Later in 2020 and into 2021, meetings for school boards, county commissions, and LHD boards of health were often fraught with anti-LHD language and recommendations. Some local elected officials, galvanized by public pressure against efforts to address COVID-19, tried to and sometimes succeeded in limiting LHDs' authority. A hospital representative described how Grand Traverse County's commissioners passed a rule prohibiting LHD staff from talking to patients about vaccines, which "the LHD couldn't do anything about."

A representative for Michigan's county commissioners shared that some local elected officials felt pushed to act because community members were suddenly contacting them and attending public meetings demanding action. They further explained that most commissioners serve part-time, and their knowledge of local public health and the intricacies of pandemic and emergency systems is limited. This detrimental misunderstanding of LHDs' power, coupled with 2022 budget language approved by Michigan's legislature limiting the authority of mask orders in schools and of LPHOs more broadly, constrained local decision making as statewide support for public health efforts continued to decline.

Many public health interviewees explained the uncertainty LHDs faced because of challenges to public authority, which sometimes ended in legal changes to LHD protocol. One LHD employee recounted how a LHD board member threatened staff job security because of the LHD's continued support of COVID-19 prevention measures—staff felt isolated and targeted simply for doing their job to protect public health.

> "Faced with our own local pressure, we decided to move [forward by] looking at other LHDs' orders. We would copy and adjust for what we needed locally and consulted our own legal team." —LHD staff

> "At one time, an LHD board member came and talked to us and said, 'You have to remember who hires and fires you—the LHD board has to approve messaging [about COVID-19 response].' We ended up battling on that; we were on an island at the time." —LHD staff

Threats to LHD Officials' Well-being

LHD staff were subjected to threats to their physical safety, the safety of their families, and their job security. LPHOs experienced being subject to citizens' arrests, being run off the road by other motorists, death threats, and threats against their families. They detailed the prevalence of "behind-the-scenes threats," including people posting malicious comments on social media and sharing those opinions at in-person events like public meetings. Multiple health officers were explicitly, personally attacked, with members of the public calling for their resignation, sometimes with an angry mob in tow. Others described local elected officials, including county commissioners and LHD board members, attempting to dismiss LPHOs from their positions or "making it difficult to run the LHD" by cutting the budget or voting to remove their county from the LHD's purview. Many LPHOs and staff expressed that they and their families were left traumatized based on the treatment they received, with some noting they could not continue in their role due to the toll on their mental health. Some even shared physical conditions that manifested because of the significant stress they endured, describing symptoms like high blood pressure, depression, and anxiety, which they never dealt with prior to the pandemic.

> "As soon as it was clear that each jurisdiction needed to be responsible for their own decisions, that was tough. It became 'every person for themselves.' [LHDs] didn't have support of any kind." —Health officer

Many interviewees agreed that LPHOs faced the brunt of attacks and blame for continuing to enforce orders related to preventing or slowing the spread of COVID-19, including masking, distancing, testing, and quarantining orders. Internal confusion over which entities should be responsible for enforcement, and public confusion over LHDs' role in protecting the public from health emergencies, resulted in LHDs being held almost solely accountable. LHD staff explained that LHDs "were left to ourselves to figure out enforcement and that has backfired," adding that MDHHS should have issued guidance on consistent messaging before asking the public to follow orders. The key question public health and local partners are now asking is, "What are the repercussions for people who do not recognize public health's authority and comply with orders?" While many public health staff agreed that everyone was "learning [about COVID-19] at the same time," LHD representatives had a "bull's-eye on our backs" because LHDs perceived that no other entities would take responsibility for issuing orders that people no longer wanted to follow.

Conclusion and Recommendations

LHDs rose to many challenges and overcame multiple roadblocks in their COVID-19 pandemic response . Their efforts were rewarded with early wins in issuing orders and reaching people through contact tracing

to reduce the spread of the disease. They also achieved incredibly high levels of vaccination in communities across the state. However, the lack of clarity around roles at the state and local levels, inadequate and outdated technology, inconsistent communication about and implementation of public orders and vaccine eligibility, and ultimately, public backlash and vitriol undermined LHDs' authority and limited broader success. The following recommendations—to be implemented by or in partnership with MALPH, the LHDs, and/or MDHHS—offer a path toward an invigorated and reinforced public health system in Michigan, increasing the likelihood of a skillful, effective response to future public health emergencies.

- Ensure emergency management protocols establish clear roles and authority for future public health crises.
- Identify and establish a clear chain of command between MDHHS and LHDs to ensure centralized coordination among public health leadership.
- Establish pandemic response infrastructure and readiness teams that are broad-based across operational areas of management, finance, volunteer recruitment, and capacity building.
- Establish relationships with agencies and organizations, including law enforcement, that can support cohesive and collaborative enforcement for quarantining, masking, and closures.
- Confirm the level of support that can be expected from law enforcement (police, sheriff, and/or the attorney general) to understand how best to engage and work with them on guidelines and orders.
- Update the Michigan Disease Surveillance System (MDSS) to support future infectious disease contact tracing efforts. Revisions to MDSS should ensure that:
    - Tracking can be modified, based on changing disease and environmental conditions.
    - The data being collected in MDSS does not duplicate data collected in other systems.
    - The data captures the number of people hospitalized due to the disease and not those identified as having the disease while in the hospital for another purpose (e.g., foot surgery).
- Develop online trainings, making them available on YouTube or other social media platforms, to support LHDs in managing and training new staff on updated contact tracing methods and software.
- Provide training for local county leaders, hospitals, healthcare systems, and elected officials on their public health role. This could include an overview of the role and responsibilities of the public health system in Michigan as well as their roles in ensuring public health and implementing the public health code. It could also include information about the roles of local boards of health (where applicable).
- In keeping with standard vaccine distribution processes, distribute vaccines only through LHDs.
- Invest in local public health infrastructure, including data systems and LHD staffing.
    - Consider identifying, mandating, and funding minimum public health staffing levels for specific public health positions, including for epidemiologists, similar to staffing requirements in hospitals, to ensure emergency and pandemic response efforts can be implemented quickly.
    - Improve training for those entering the local public health workforce and create career pathways to incentivize epidemiologists to go into public health.
    - Advocate for more flexible funding that is not designated to a specific crisis or issue.
    - Increase Michigan's PPE and medical device stockpile (e.g., ventilators, infrared thermometers).
    - Ensure public health communication and messaging is included in public health degree curriculum and invest in communication and public information officer positions across LHDs.

Appendix: Organizations and MDHHS Administrations, Bureaus, and Divisions That Participated in Interviews and/or Discussion Groups

- Area Agency on Aging Association of Michigan
- Bureau of EMS, Trauma, and Preparedness; Public Health Administration, MDHHS
- Local Public Health; Bureau of Health and Wellness; Public Health Administration, MDHHS
- Bureau of Health and Wellness; Public Health Administration, MDHHS
- City of Detroit Health Department
- Early Childhood Investment Corporation
- Emergency Preparedness and Response Division; Bureau of EMS, Trauma, and Preparedness; Public Health Administration, MDHHS
- Health Department of Northwest Michigan, former health officer
- Healthcare Association of Michigan
- Ingham County Health Department
- Luce-Mackinaw-Alger-Schoolcraft District Health Department
- Macomb County Health Department
- MALPH Nurse Administrators Forum
- MALPH Physicians Forum
- MALPH Promotion and Education Forum
- Michigan Association of Counties
- Michigan Association of Intermediate School Administrations
- Michigan Health and Hospital Association (interview and discussion group)
- Michigan Sheriff Association
- Mid-Michigan District Health Department, former health officer
- Office of the Chief Medical Executive, MDHHS
- Public Health Administration, MDHHS
- Restaurant and Lodging Association
- Saginaw County Health Department
- Small Business Association of Michigan
- Washtenaw County Health Department

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