NASHVILLE METRO PUBLIC HEALTH DEPARTMENT COVID-19

After-Action Report and Improvement Plan

Metro Public Health Dept
Nashville/Davidson County
Protecting, Improving, and Sustaining Health

JUNE 30, 2023

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1. Introduction

The Nashville Metro Public Health Department (MPHD) played a critical role in the response to and recovery from the COVID-19 pandemic. Because COVID-19 cases were likely to emerge across Nashville and Davidson County, the MPHD Regional Health Operations Center (RHOC) was activated on February 27, 2020. The objective of the RHOC was to monitor, coordinate, and provide messaging in support of the COVID-19 response.

The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020, and on March 12, Tennessee Governor Bill Lee declared a state of emergency to facilitate a coordinated statewide response. On March 18, Mayor John Cooper issued a state of emergency within metropolitan Nashville and Davidson County, which established temporary restrictions to reduce the spread of the virus, including restrictions on social gatherings and businesses. MPHD swiftly responded by increasing COVID-19 case investigations and contact tracing efforts, coordinating wraparound services for community members, developing Strike Team capabilities to reach vulnerable and underserved communities, establishing a COVID-19 Hotline, and establishing testing and vaccination sites throughout the Metro area.

Approximately 86 agencies and community partner organizations supported MPHD's sustained response efforts, and on December 31, 2022, after 34 months of activation, MPHD deactivated its COVID-19 response. During the activation, MPHD staff selflessly supported the ongoing response and exhibited professionalism and compassion for the citizens of Nashville and Davidson County. From February 27, 2020, through December 28, 2022, Davidson County reported 247,844 confirmed resident cases of COVID-19, resulting in 1,765 deaths. The complete timeline of major events is presented in Appendix D.

COVID-19 affected all facets of the lives of the citizens of Nashville and Davidson County, and it required the most significant sustained response and recovery effort in public health emergency history. This *Nashville Metro Public Health Department COVID-19 After-Action Report (AAR) and Improvement Plan (IP)* is the result of the combined efforts of MPHD and numerous response partners, Metro departments, and community-based and nonprofit organizations that provided valuable input to evaluate strengths and indicate areas for improvement and corrective actions to advance MPHD's response posture.

1.1. Purpose

Due to the magnitude and length of the COVID-19 response and recovery efforts, MPHD determined the need for a comprehensive after-action review of strengths and recommended practices, real-time adaptations and corrections, and areas for improvement during the long-term response to COVID-19. This review represents information gathered during MPHD's emergency response to the COVID-19 outbreak in the 34-month period between February 2020 and December 2022.

1.2. Scope

The impact of the COVID-19 pandemic established the need for an after-action review of lessons learned, strengths, and areas of improvement for response and recovery actions taken from February 27, 2020, through December 31, 2022. This AAR represents information gathered during MPHD's emergency response to and recovery from the pandemic. It may guide future planning prioritization and formalization of planning processes and identify gaps to be addressed by MPHD. The AAR is supported by an Improvement Plan (IP) that prioritizes future actions. It can be found in Appendix A.

1.3. Summary of Findings

This report is a review of coordinated actions between the Nashville MPHD and partner organizations that supported the extended response to and recovery from the COVID-19 pandemic. This AAR included a

review of available incident documentation and pertinent information to develop a baseline of expected emergency response and support procedures. Individual survey responses provided additional information regarding response and recovery activities. Each finding in this AAR is attributed to applicable Federal Emergency Management Agency Core Capabilities and Public Health Emergency Preparedness (PHEP) Capabilities. The IP included in Appendix A: includes associated recommendations, identifies agencies responsible for implementing those recommendations, and estimates timeframes for implementation.

1.3.1. Primary Strengths

The major strengths identified for the MPHD's response to the COVID-19 pandemic are as follows:

- Communication with traditional and non-traditional partners and early establishment of partnership between MPHD, OEM, and Mayor's Office

- The COVID-19 case investigations leadership team and wraparound services provided to the citizens of Nashville and Davidson County

- MPHD support for individuals experiencing homelessness

- Music City Center and Nissan Stadium Vaccination PODs

- Strike Team Operations

- Public Health Emergency Preparedness Logistics Operations

1.3.2. Primary Areas for Improvement

The primary areas for improvement and recommended actions identified for MPHD's response to the COVID-19 pandemic are as follows:

- Commitment to utilizing the Incident Command Structure (ICS) and improvement in internal ICS training

- MPHD leadership communication with staff

- Incorporation of social work component into large scale case investigation operations

- Consistent promotion of wellness and mental health resources for MPHD staff

Table 1 summarizes the strengths and areas for improvement, which are detailed in the analysis section.

Table 1: Summary of Strengths and Areas for Improvement

Reference	Topic	Strengths	Areas for Improvement
2.1	Operational Coordination and Structure	Quick onboarding of temporary workers for surge staffing	Commitment to utilizing the Incident Command Structure
			Enhanced screening of temporary staff candidates
2.2	Operational Communication	Communication with external partners	MPHD leadership communication with staff
2.3	Multi-Agency Coordination	Early establishment of working relationships between MPHD, OEM, and Mayor's Office	N/A

Reference	Topic	Strengths	Areas for Improvement
		Partnership with Nashville Department of Emergency Communications in development of COVID-19 query project	
2.4	Epidemiologic Response	COVID-19 case investigation operations	Establishment of a social work component during the course of large-scale case investigations
		Wrap around services provided during COVID-19 case investigations	
		Epidemiologist communication and coordination with COVID-19 case investigators	
		Separate case investigation and contact tracing teams	
		COVID-19 case investigation training	
		Implementation of the TeleTask Texting System	
		Development of Davidson County COVID-19 Dashboard	Communication with public regarding the use of the TeleTask Texting System and timeliness of use
2.5	Public Information	Translation Services	Availability of translators
		MPHD COVID-19 Hotline	
2.6	Social Services and Human Needs	Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Increase advertisement efforts for community events
		Community Health Worker Program	Consistent promotion of wellness and mental health resources for MPHD staff
		Support for incarcerated individuals	
		Support for individuals experiencing homelessness	
2.7	COVID-19 Testing	COVID-19 assessment center accessibility	N/A
		Strike Team testing support	
2.8	COVID-19 Vaccination	Multi-agency vaccination efforts	N/A
		Music City Center and Nissan Stadium Vaccination PODs	
		POD Planning Team	
		Vaccination standby list	
2.9	Strike Team Operations	Strike Team operations and management	Additional translation services available at Strike Team events
2.10	Technology	Metro ITS liaison integration with MPHD	RedCap project as Vaccination Scheduler

Reference	Topic	Strengths	Areas for Improvement
			Case investigations did not utilize RedCap earlier in the case monitoring process
2.11	Resources, Procurement, and Supply Chain Management	MPHD Public Health Emergency Preparedness Logistics Operations	N/A
		Mask distribution efforts	
2.12	Order Enforcement	Online event application process	N/A
		MPHD Director's Health Order enforcement efforts	
2.13	COVID-19 Variants	MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community	N/A
2.14	Finance	N/A	Lack of a standardized method to track spending
2.15	Recovery and Demobilization	Phased demobilization strategy	Improved public communication for Strike Team demobilization

2. Analysis

This section reviews the major strengths and areas for improvement identified in the AAR process. Each observation is presented as a strength or an area for improvement, identifies associated core capabilities, is based on observations documented through the data-collection process, and, if appropriate, presents recommendations that are specific and actionable. The observations are presented in 15 sections, as shown in Figure 1.
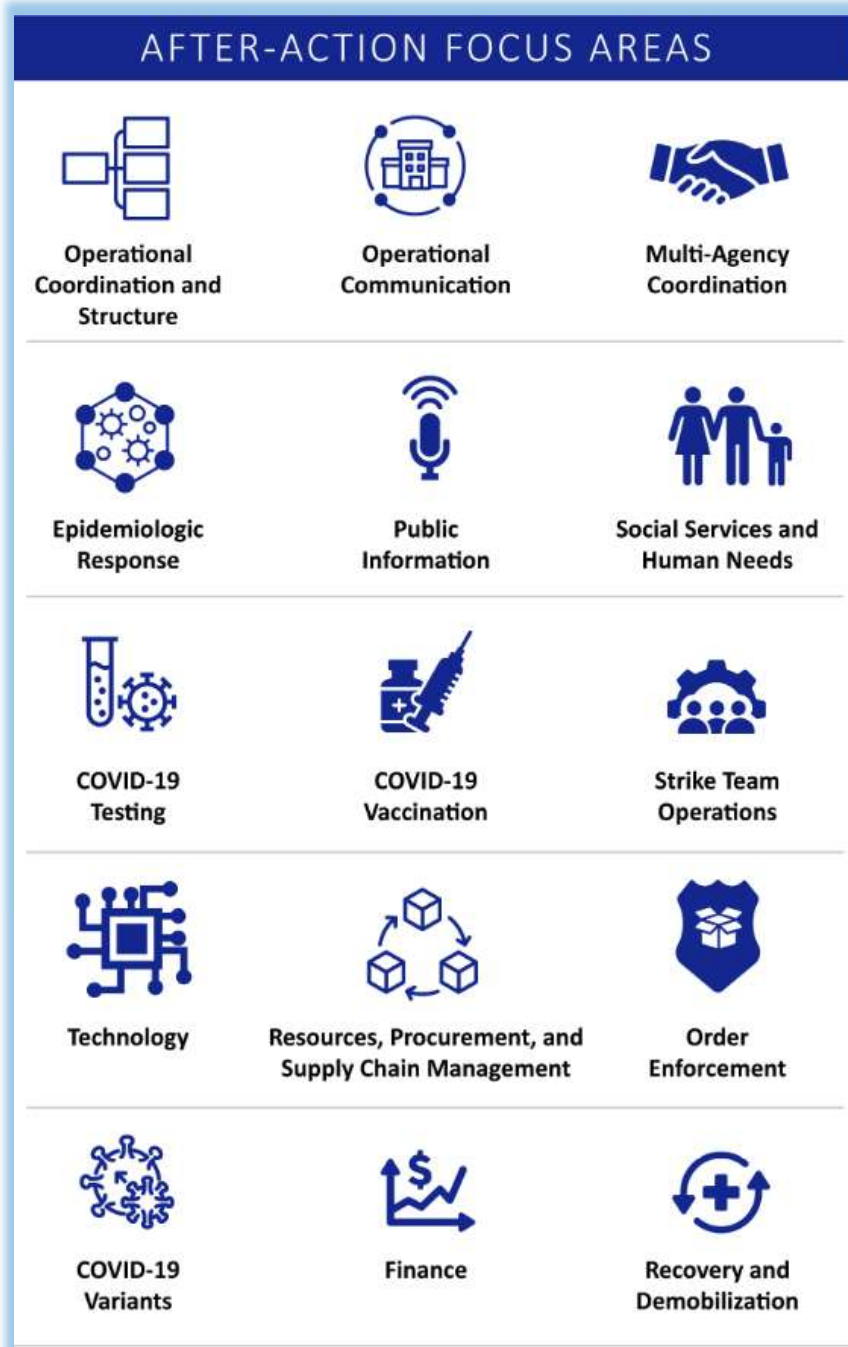

Figure 1: After-Action Focus Areas

2.1. Coordination and Structure

This section provides strengths and areas for improvement related to operational coordination and structure activities during the COVID-19 pandemic.

2.1.1. Strength: Quick onboarding of temporary workers for surge staffing

Observation: MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: Staffing throughout the pandemic was a concern, but MPHD management and RHOC staff coordinated extremely well with recruiters, staffing agencies, and HR staff to quickly on-board temporary staff members to fill positions in roles throughout MPHD. During peak hiring, HR onboarded up to 15 temporary staff members daily. To streamline the onboarding process, during the new hire background check wait times, HR worked to complete the necessary paperwork and information technology (IT) requirements with new staff prior to the start dates. Temporary staff were utilized to quickly provide additional support to the case investigations team and to provide staffing to develop the strike teams. Both operations were crucial to MPHD's ability to serve the most vulnerable populations of the city and county.

Recommendation:

    a. Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/counselors, strike team members.

2.1.2. Area for Improvement: Commitment to utilizing the Incident Command System (ICS) during response operations

Observation: Stakeholders noted that throughout the response, MPHD leadership was not consistent with MPHD's response approach and did not fully utilize the ICS.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination, Community Preparedness

Analysis: While MPHD utilized some components of the ICS during its response to COVID-19, many stakeholders noted that throughout the response, MPHD leadership was not consistent with their approach and did not fully embrace the ICS. This led to reinventing processes that were already established and created an overall lack of direction. In addition, several stakeholders noted that the lack of a cohesive response structure contributed to internal communication breakdowns and greatly influenced the sharing of information both internally and with the public, which further contributed to public mistrust. Affirming a commitment to utilizing the ICS will give MPHD a standardized incident management structure that can be tailored to match the complexities of any incident and give stakeholders clear response leadership and guidance.

Recommendations:

    a. Assign and properly train key primary and alternate RHOC positions.

    b. Consider cross-training RHOC positions to ensure staff coverage.

c. Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.

d. Establish the roles and responsibilities of the Executive Leadership Team (ELT) during response operations.

2.1.3. Area for Improvement: Enhanced screening of temporary staff candidates

Observation: Stakeholders noted the need for better screening of temporary staff during operations that required surge staffing.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: The use of temporary staff was crucial to the success of MPHD's response and recovery to COVID-19. MPHD's management and RHOC staff, along with recruiters, staffing agencies, and HR professionals, worked tirelessly to fill roles in the most critical mission sets as efficiently and effectively as possible. Challenges were expected with the employment of so many temporary staff. Although the process to onboard staff was accelerated because of the situation was mostly positive, it was noted that in the future, care should be taken to better screen candidates.

Recommendation:

a. Develop protocols for screening and hiring temporary and contract employees.

2.2. Operational Communication

This section provides strengths and areas for improvement related to operational communication activities during the COVID-19 pandemic.

2.2.1. Strength: Communication with external partners

Observation: MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.

Core Capability: Operational Communications, Planning

PHEP Capability: Community Preparedness, Emergency Operations Coordination

Analysis: Almost immediately, MPHD held conference calls with Metro department leads and area hospitals to coordinate response actions. In addition, special interest groups, including religious leaders, childcare providers, Metro Nashville Public Schools (MNPS), the visitor's bureau, and the airport were contacted quickly. These reoccurring calls provided the opportunity for partners to establish clear lines of communication, set expectations for the response, identify community needs, and provide accurate information for partners to share with their networks.

Recommendations:

a. Maintain and mature the relationships formed during MPHD's response.

b. Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.

c. Include special interest groups in future public health preparedness drills and exercises.

2.2.2. Area for Improvement: MPHD leadership's communication to staff

Observation: Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.

Core Capability: Operational Communications, Situational Assessment

PHEP Capability: Information Sharing

Analysis: Many staff noted the lack of communication and transparency from MPHD leadership, particularly in the early stages of the response. Much of the information flow was received via second or third parties or rumors. This lack of communication led to frustration throughout MPHD. Some staff indicated that information was received via press conferences or news outlets instead of via internal leadership chains. As changes in leadership occurred, improvements in communication were noted. However, internal communication was not a perceived priority for MPHD leadership throughout the response.

Recommendation:

    a. Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.

2.3. Multi-Agency Coordination

This section provides strengths and areas for improvement related to multi-agency coordination activities during the COVID-19 pandemic.

2.3.1. Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office

Observation: Frequent coordination and communication between MPHD, the Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD, OEM, and the Mayor's Office coordinated weekly or as needed to develop operational consistency. This helped to focus MPHD's efforts and enabled a more effective response for all agencies. Prior to the pandemic, communication between the agencies rarely occurred. MPHD, OEM, and the Mayor's Office have now formed a strong partnership and continue to develop that relationship post-response.

Recommendations:

    a. Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.

    b. Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercises.

2.3.2. Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project

Observation: MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD provided DEC with a daily count of positive COVID-19 cases in the Metro Nashville jurisdiction, including each case's home address. Initially, the data were manually entered into DEC's dispatch system. However, with the volume of daily cases, DEC technicians quickly became overwhelmed and struggled to keep up with data entry. Manual entry lasted approximately 2–4 weeks until it was possible to link MPHD's and DEC's databases. This eliminated the need to manually enter data, and it provided real-time information to DEC. DEC coordinated with Motorola to build a simple query that would notify the emergency dispatcher when a positive COVID-19 case was reported at the address where first responders were being dispatched. Dispatch codes were used to ensure patient privacy and remain in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA). This simple tool ensured that first responders remained safe and were taking proper safety precautions when responding to emergency calls. The interface between the databases was deactivated on April 12, 2021, but it can be reactivated if needed.

Recommendations:

    a. Continue to maintain interfacing capabilities for future needs.

    b. Capture interfacing/query capability in future pandemic planning efforts.

    c. Incorporate database interfacing capability into future exercises and drills.

2.4. Epidemiologic Response

This section provides strengths and areas for improvement related to epidemiologic response activities during the COVID-19 pandemic.

2.4.1. Strength: COVID-19 case investigation operations

Observation: The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In March 2020, four epidemiologists from MPHD began case investigations and quickly expanded the team by using both internal Metro employees and temporary staff to assist with hundreds of daily COVID-19 cases. The case investigations team eventually grew to over 40 investigators who interviewed cases following epidemiological protocols and connected cases with community resources to assist them with their needs while in isolation. The MPHD case investigations team handled a massive number of COVID-19 cases and managed an enormous amount of data. Their data allowed MPHD to review case clusters throughout the city in a timely manner and provide updates to MPHD and city leadership as required. Throughout the response, the case investigations team continuously improved processes even as the required databases and protocols frequently changed. Nashville and Davidson County experienced one of the highest COVID-19 case counts in Tennessee, and the dedication and leadership of the case investigation team made this operation one of the most successful in MPHD.

Recommendations:

a. Record case investigation processes and procedures in future pandemic planning efforts.

b. Consider procuring standing contracts with companies on an "as-needed" basis for future surge staffing needs.

2.4.2. Strength: Wraparound services provided during COVID-19 case investigations

Observation: As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the course of case investigations, the team offered to connect patients with community resources while in isolation. Resources such as thermometer delivery, meal delivery through partnership with Second Harvest, and mental health services were provided to assist those who were in isolation. A great deal of resources, time, and empathy were given to every case that required additional attention and support. This outreach service was the only one of its kind in the region, and it compassionately served the citizens of Nashville and Davidson County.

Recommendations:

a. Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

b. Maintain a list of viable community organizations that were helpful in providing wraparound services and use Where to Turn in Nashville (WTTIN) as a resource.

2.4.3. Strength: Epidemiologist communication and coordination with COVID-19 case investigators

Observation: Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation leadership team conducted weekly meetings to share information and updates from the Centers for Disease Control and Prevention (CDC) and the Tennessee Department of Health, answer investigator questions, and gather information regarding clusters and other trends throughout the city and county. Prior to the meeting, case investigators submitted questions or concerns to the epidemiology leadership team to better prepare for and address the issues that were of most concern. Moreover, a member of the epidemiology team was always available to address time-sensitive issues or emergencies that arose. The team also provided weekly email updates with links and background information to help investigators stay up to date on COVID-19 and pandemic guidance. Daily operations were also effectively and efficiently managed by the epidemiology team by assigning cases to investigators each morning as opposed to investigators assigning themselves cases.

Recommendation:

a. Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.

2.4.4. Strength: Separate case investigation and contact tracing teams

Observation: MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care

Analysis: Surge staffing enabled team leadership to establish a separate contact tracing element that contacted only individuals in quarantine who had been exposed to a confirmed case, while the case investigations team monitored cases in isolation. This contact tracing team took a great deal of burden off epidemiologists, who might have been required to make multiple calls for one case if they were also required to monitor contacts. The contact tracing team enabled MPHD to provide contacts with essential monitoring attention. This included access to wraparound serves and free thermometer delivery if needed, since temperature monitoring was a way to determine if a close contact was becoming a case. Staffing for the case investigation and contact tracing teams eventually surged to over 150 people, and they were integral to MPHD's operations.

Recommendations:

    a. Capture mass case investigation processes and procedures in future pandemic planning efforts.

    b. Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

2.4.5. Strength: COVID-19 case investigation training

Observation: Training was the key to the success of MPHD's COVID-19 case investigation operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation team was staffed with both MPHD internal staff and temporary surge staff with diverse professional backgrounds. Due to this, the case investigation epidemiologist leadership team developed COVID-19 investigation for team members who were less experienced with epidemiological protocols, case monitoring, and contact tracing procedures. The training was initially provided in person. Later, it was combined with an "investigator guide" that could be referenced later and provided investigators with helpful tools for completing investigations effectively. The training helped set expectations and provided material for investigators to become familiar with processes and procedures for case investigation. Guidance was updated, and investigators were briefed as case and contact monitoring guidance changed.

Recommendations:

    a. Consider including an investigator guide as an annex in future pandemic planning efforts.

    b. Memorialize case investigation processes and best practices for future pandemic planning efforts.

2.4.6. Strength: Implementation of the TeleTask Texting System

Observation: Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: At the height of COVID-19 case investigations, MPHD was receiving thousands new cases weekly, which made it nearly impossible to reach all cases and their associated contacts. Implementing the TeleTask Texting System helped make this a more manageable process by providing automated texts to the parties. Such texts would be sent to a positive case and the case's provided contacts. Included in the text was a survey with an abbreviated version of the questions asked by case investigators when contacted directly (see Figure 2). The data from the automated TeleTask survey was directly integrated into MPHD systems, which seamlessly collected the required information and demographics. The TeleTask texts could be translated into Spanish and Arabic and were integral to mass data collection efforts during increased caseloads.
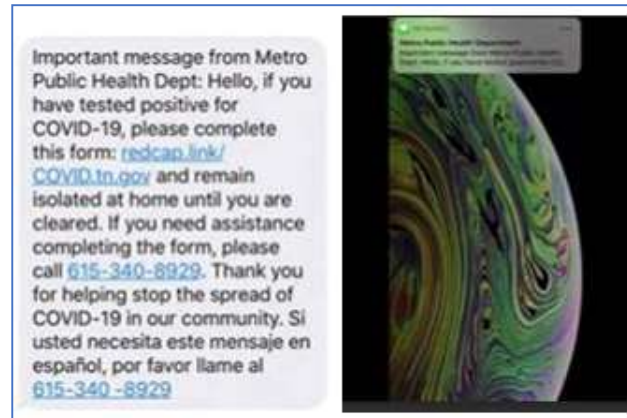

Figure 2: Sample TeleTask Message

Recommendation:

a.   Consider maintaining a mass texting system for other MPHD public health efforts.

2.4.7. Strength: Development of the Davidson County COVID-19 Dashboard

Observation: In partnership with Metro Information Technology Services (ITS), MPHD utilized in-house expertise to create a public facing dashboard to track several data points.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning

Analysis: In conjunction with Metro ITS, MPHD developed a public facing COVID-19 GIS data dashboard, which allowed stakeholders to observe trends during the pandemic response and recovery. Data included case counts, historical data, hospitalizations, mortality, and testing. The dashboard also informed MPHD and city leadership by providing insight to quickly make decisions, with the data being analyzed and reported by skilled epidemiologists. At times, pressure from leadership made data analysis difficult and stressful on the already overtasked staff. However, this dashboard helped to make data reporting consistently accurate and robust. Information was reported daily, weekly, and eventually on a monthly basis until December 28, 2022, when the dashboard was archived for historical purposes.

Recommendations:

a.   Train additional staff in the development of content for dashboards and related tools.

b.   Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).

c.   Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Figure 3: Davidson County COVID-19 Dashboard

2.4.8. Area for Improvement: Establishment of a social work component during large-scale case investigations

Observation: The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the case investigations, MPHD investigators quickly realized that to serve the citizens of Nashville and Davidson County better, their physical and mental needs required support, particularly in the early stages of the pandemic when isolation protocols were unfamiliar and public anxiety was high. Community resources were key to ensuring that individuals' needs were best served, but case investigators were not equipped or trained to easily provide direction on accessing those services. Case investigators invested a great deal of time to familiarize themselves with community resources to which cases could be referred. Cases that were expected to take only 20 minutes could quickly become day-long case management situations, which put massive stress on an already overtasked team. Later in the response, MPHD partnered with community organizations that helped to provide easy access to resources. However, the diverse needs of the community would have been better served with internal access to licensed and trained social workers or counselors familiar and in touch with community resources who could assist the case investigation team during large-scale operations like COVID-19.

Recommendations:

a. Establish an internal social work department to partner with case investigations during future large-scale operations.

b. Identify and include community-based organizations that support underserved communities to assist with case management.

c. Mature relationships developed during pandemic; include community partners in pandemic planning efforts.

2.4.9. Area for Improvement: Communication with the public regarding the TeleTask Texting System and timeliness of use

Observation: The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number of cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: Although the TeleTask Texting System was immensely helpful, there was some confusion with the public as to what the text meant or why they were receiving it. Stakeholders stated that people believed that the text was spam and an attempt to gain personal information, so many deleted it without providing the requested information. Moreover, implementing the TeleTask Texting System took longer than optimal because of the need to ensure that the messages sent and received would be HIPPA compliant. While the TeleTask Texting tool was helpful, it would have been valuable much earlier in the response when MPHD received an unmanageable number of cases each day.

Recommendations:

   a. Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.

   b. Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.

2.5. Public Information

This section provides strengths and areas for improvement related to public information activities during the COVID-19 pandemic.

2.5.1. Strength: Translation Services

Observation: MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: MPHD used several sources to provide verbal and written translations. In-house Spanish and Arabic translation teams efficiently translated vital medical documents, marketing information, education materials, and testing and vaccination flyers; updating ever-evolving guidance; and assisting at community events and with case investigations. Vendor services were used to translate languages outside of Spanish and Arabic, including Zomi, Swahili, Somali, Napali, Karen, and Burmese.

Figure 4: COVID-19 Protect Yourself Social Media Infographic in Burmese

With the help of translation services, MPHD's Social Media Coordinator designed infographics in multiple languages for social media campaign efforts. The case investigations team and the Strike Teams also had access to the Language Line to further expand translation capabilities. It was noted that, at times, translated printed materials were often delayed.

Recommendations:

a. Due to delays outside of MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.

b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

c. Ensure ample interpreters are available during community events, such as testing and vaccine PODs.

d. Ensure new and temporary employees are properly trained on Language Line operations.

e. Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.

2.5.2. Strength: The MPHD COVID-19 Hotline

Observation: Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: During the early stages of the response, MPHD coordinated with both Metro ITS and MPHD ITS to stand up a call center to receive calls from the general public on the MPHD COVID-19 Hotline. Just-in-time training was quickly developed so call center staff cold provide the most current information to callers. Hotline leadership provided a calming confidence that enabled staff to easily pivot based on daily reports or frequent changes to guidance. Call center staffing was primarily sourced from MPHD school nurses and in-school dental staff; it surged to 12 operators and one supervisor. To ensure consistent messaging, a hotline script was developed that was user-friendly, clear, and concise. It provided information on available resources and answers to frequently asked questions, which were updated often. As the general public became more familiar with COVID-19 procedures and testing operations were opened throughout the city, calls began to decrease. In October 2020, the COVID-19 Hotline transitioned outside of MPHD and over to hubNashville.

Recommendation:

a. Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

2.5.3. Area for Improvement: Availability of Translators

Observation: MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: It was noted that, at times, there were not enough translators to keep up with the volume of translation services requested. Translators were not always available during case investigations, contact tracing, Strike Team events, and other community events.

Recommendations:

a. Provide resources to recruit and retain additional bi-lingual staff members.

b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

c. Consider procuring "as needed" contracts for translation services.

d. Ensure ample interpreters are available during community events, such as testing and vaccination PODs.

2.6. Social Services and Human Needs

This section provides strengths and areas for improvement related to social services and human needs activities during the COVID-19 pandemic.

2.6.1. Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations

Observation: MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Using data-driven decisions obtained through contact tracing and other surveillance methods such as tracking COVID-19 hotspots, MPHD prioritized responses to the region's most vulnerable populations. Community partners, such as the Tennessee Immigration and Refugee Rights Coalition (TIRRC) and Siloam and community leaders, were engaged to help MPHD reach the most vulnerable community members. When testing and vaccines were available, MPHD located testing and vaccination sites in communities throughout the county that might have been disproportionately affected by COVID-19. Teams from MPHD engaged vulnerable populations, including inmates, individuals experiencing homelessness, the elderly, those considered high-risk, and minority populations. MPHD teams also identified the need to support these groups where they were. Teams traveled to jails, assisted living facilities, half-way houses, shelters, places of worship, hospitals, and public areas to offer services. Homebound services were also offered to individuals who could not travel to vaccination sites because of limited mobility or other circumstances. Throughout the response, MPHD staff demonstrated professionalism and compassion toward the city and county's most at-risk groups.

Recommendations:

a. Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city and county's underserved and diverse communities.

b. Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.

2.6.2. Strength: Community Health Worker Program

Observation: MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD partnered with Siloam Health to provide at least three weeks of follow-up care for patients who met certain criteria and were referred to the Community Health Worker (CHW) program. A CHW was a member of the patient's community who could communicate with the patient utilizing the patient's spoken and written language. CHWs provided wraparound services with the long-term goal of successfully completing isolation. CHWs helped patients access resources, including health insurance, food, housing, quality care, and health information while ensuring that health conditions were understood, and strategies were in place to improve the patient's overall wellbeing. All wraparound services were delivered using culturally and linguistically appropriate terminology and concepts. CHWs provided informal counseling, support, and follow-up. When necessary, they connected patients with MPHD for further services. The CHW's highest priorities were to establish trust with the individuals with whom they were working and to collaborate with MPHD monitors and investigators to best serve the patient.

Recommendations:

    a. Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.

    b. Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.

2.6.3. Strength: Support for incarcerated individuals

Observation: Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Early in MPHD's response, MPHD recognized the need to quickly develop just-in-time training for Strike Team members to deploy to Metro jails to provide education, contact tracing, isolation and quarantine guidance, planning, testing, and vaccination services to Davidson County inmates. Despite the potential for a catastrophic disaster, MPHD's correctional health team worked diligently to best support this unique population until April 2022, when support services were fully turned over to a third-party contractor.

Recommendations:

    a. Develop more robust mutual aid agreements with the Sherriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

    b. Include response partners in future pandemic planning to ensure that fully developed response plans are created.

2.6.4. Strength: Support for individuals experiencing homelessness

Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: In partnership with Nashville OEM and Metro Social Services and without existing city plans, MPHD dedicated an abundance of resources to ensure that the unique needs of individuals experiencing homelessness were met. For those displaced by the pandemic, shelter services were quickly established at the fairgrounds and the Brick Church Pike Shelter. In addition, clean and safe non-congregate isolation and quarantine spaces were provided through collaboration with the Nashville Rescue Mission and Room in the Inn. MPHD also worked with the Homeless Impact Division and other community partners to

provide equitable care for the homeless community by arranging for transportation to and from the hospital and providing testing and vaccination events specifically targeted toward individuals experiencing homelessness. Strike Teams traveled to established homeless and transient camps to provide testing and vaccination services, often returning to ensure subsequent doses of the COVID-19 vaccine were administered to individuals. The constant presence of MPHD staff helped to build trust with transient communities and those experiencing homelessness.

Recommendations:

   a.   The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.

   b.   Maintain contracts with transport vendors for future public health events.

2.6.5. Area for Improvement: Increase advertisement efforts for community events

Observation: More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped reach more members of vulnerable communities.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD and the City of Nashville prioritized vulnerable and underserved communities with countless resources and wraparound services throughout the pandemic. Dedicated staff worked tirelessly to serve the city and county's most vulnerable populations, but there was a lack of citywide cohesive response efforts to serve these communities. At times, this limited the visibility of the resources that *were* available. Future responses should include efforts to coordinate with city and county departments and community-based organizations to ensure that vulnerable communities have better visibility on available resources and events designed to support them.

Recommendation:

   a.   Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.

2.6.6. Area for Improvement: Consistent promotion of wellness and mental health resources for MPHD staff

Observation: More mental health wellness resources are needed for MPHD staff when activated for sustained complex response operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD staff were activated on February 27, 2020, when MPHD initially stood up COVID-19 response operations. They did not officially stand-down pandemic response operations until December 31, 2022. Through 34 months of the pandemic response, many staff in MPHD worked nonstop. While dedicated to the success of MPHD's response, many positions had limited trained staff available to backfill roles, which resulted in fatigue and frustration. Many stakeholders noted that the availability of mental health support was not adequate to support the long-term well-being of staff in MPHD.

Recommendations:

    a. Use city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation.

    b. Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation.

    c. Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.

2.7. COVID-19 Testing

This section provides strengths and areas for improvement related to COVID-19 testing activities during the COVID-19 pandemic.

2.7.1. Strength: COVID-19 assessment center accessibility

Observation: Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Assessment centers were established throughout the city to ensure widespread access to COVID-19 testing for all community members. Assessment center types and locations were diverse, with flexible operating hours to accommodate as many residents as possible. The city maintained three large drive-thru assessment centers: Kmart, Nissan, and Meharry. These sites could accommodate large numbers of people and provide regular testing throughout the city. To ensure health equity, assessment centers were strategically placed throughout Davidson County in areas that would provide easy access to vulnerable and underserved populations. In addition, Strike Teams provided testing capabilities to communities that might have difficulty traveling to testing sites. COVID-19 assessment center operations were a true community effort, with several organizations coordinating to serve the residents of Nashville and Davidson County expertly and compassionately.

Figure 5: Nissan Assessment Center

Recommendations:

    a. Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.

    b. Hold assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

    c. Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.

2.7.2. Strength: Strike Team testing support

Observation: MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Throughout 2020, when COVID-19 testing became available, Strike Teams hosted testing events 7 days per week, often with extended hours outside of 8 am to 5 pm, to accommodate the working populations. Teams also established a few standing testing events each week, so community members were aware of the locations to receive needed or desired testing. In addition, Strike Team members were heavily connected with community leaders and partners, reaching out to inquire about recommended testing locations within the community. Teams were consistently available and were rarely unable to accommodate a request for a testing event. Strike Teams were flexible, accommodating, and innovative in providing testing services to vulnerable populations.

Recommendation:

    a.   Increase efforts to advertise Strike Team testing event locations to reach a larger audience.

**Figure 6: Strike Team supporting Lentz pop-up drive-thru
testing event on New Year's Eve 2021**

2.8. COVID-19 Vaccination

This section provides strengths and areas for improvement related to COVID-19 vaccination activities during the COVID-19 pandemic.

2.8.1. Strength: Multi-agency vaccination efforts

Observation: Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, the Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: The partnership between MPHD and supporting organizations to distribute and provide vaccines in the population centers throughout the city executed a well-coordinated and effective strategy. The efforts to remove obstacles for access included mass drive-thru and walk-in PODs, Strike Team pop-up events in underserved communities, home visits for community members who could not access vaccination events, translation services, and multiple communication mechanisms to inform the public of events taking place throughout the city and county.

Recommendation:

a. Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.

2.8.2. *Strength:* Mass vaccination PODs at Music City Center and Nissan Stadium

Observation: With the support of community partners, MPHD planned and managed mass vaccination PODs at Music City Center (MCC) and Nissan Stadium, which were highly successful in providing residents with COVID-19 vaccines.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management

Analysis: The MCC vaccination POD was a monumental undertaking led and operated by MPHD in collaboration with several community partners, including MCC staff, Hands On Nashville, OEM, and Metro Parks. The MCC POD opened on January 30, 2021, to begin administering the Pfizer vaccine to people 75 and older and those that qualified in 1a1. People were required to have an appointment to receive the vaccine. Parking was free in nearby parking structures, and there was a complimentary shuttle to the POD entrance. Hands On Nashville volunteers assisted with wheelchair access, and they directed patients to appropriate vaccination lines for quick and efficient processing. The MCC POD was well organized and expertly managed, and it received praise from all involved stakeholders, partner agencies, and the general public. The Music City Center POD was in operation until May 28, 2021, and it administered 107,366 free vaccine doses.

The Nissan Stadium POD was a one-day drive-thru vaccination event planned in 18 days by dedicated MPHD staff members, and it was a true model of community care. MPHD's employees volunteered to help staff the POD, along with the support of local community partners ranging from Metro police and fire departments, the Nashville Department of Transportation, Hands On Nashville volunteers, the Tennessee National Guard, and personnel from Bellmont Nursing and Pharmacy Schools and the Vanderbilt Nursing School. Routes and traffic control plans, along with proper signage, helped maintain the flow of traffic and prevented traffic from impacting areas near the venue. Furthermore, many in the community were made aware of the event through extensive media coverage and having several local news outlets on site. The whole community, alongside MPHD, stepped up to ensure that people were vaccinated in a timely, organized, and efficient manner. This event proved to be a massive success for the city and MPHD, and it resulted in 10,107 vaccines given in a single day.

Figure 7: MPHD Mass Vaccination POD at the Music City Center

Figure 8: POD at Nissan Stadium

Recommendations:

a. Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

b. Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.

c. Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.

2.8.3. Strength: MPHD Vaccination POD Planning Teams

Observation: With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.

Core Capability: Planning

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: Subject matter experts from MPHD planned the vaccination PODS at both MCC and Nissan Stadium in a short timeframe and with limited guidance. Their efforts created extensive plans that included coordination with multiple community partners, detailed traffic and crowd flow, consideration for vulnerable populations and those with access and functional needs, media engagement, and follow -on education. The Nissan Stadium POD, which was planned and executed in 18 days, provided Johnson & Johnson vaccine to culminated with over 10,000 Davidson County residents in one day receiving the Johnson & Johnson shot. The MCC POD operated in downtown Nashville for four months. The planning team expertly designed the MCC's operations in 8 days. The MCC POD administered over 100,000 Pfizer doses, including booster doses. The expertise, innovation, and dedication of the MPHD planning teams were integral to the success of the mass vaccination PODs at MCC and Nissan Stadium.

Additionally, the planning and logistical efforts of the PHEP Department largely influenced the Nissan and MCC PODs and contributed to their successes. Before operations at MCC and Nissan Stadium, the MPHD site (Lentz) was used to provide vaccines to the elderly (those in Tier 1). Because this was a more vulnerable population, MPHD staff attempted to maintain social distancing among patients while keeping them out of the frigid temperatures, since the PODs were being held in January 2021. The PHEP team planned the flow of the POD, set up multiple vaccination stations inside, set up a waiting area in the lobby, and allowed for ingress and egress so the maximum number could wait inside both before and after their vaccine. PHEP also developed a traffic flow plan that enabled people to park and wait in their cars and then be released on a first in–first out basis. Also, there was the added benefit of doing this POD at MPHD's home base. This experience gave MPHD guidance for future PODs at Lentz, which has since been implemented there.

Recommendations:

    a.   Include a mass POD plan annex in future pandemic planning efforts.

    b.   Train and exercise mass POD operations.

2.8.4. Strength: Vaccination standby list

Observation: To ensure all doses from a vial were used, MPHD developed a vaccine standby list for those willing to get COVID-19 vaccinations at the last minute.

Core Capability: Planning, Public Information and Warning

PHEP Capability: Medical Countermeasure Dispensing and Administration, Information Sharing

Analysis: Because of the increased demand for vaccines and to ensure that all doses were utilized, MPHD developed a standby list for those interested in receiving the COVID-19 vaccine on short notice. The public could email their contact information to an MPHD inbox, with the understanding that they could arrive at the vaccination POD 20 minutes before the site closed and receive a vaccination. Toward the end of the day, MPHD staff would contact the vaccine site to confirm the number of remaining doses. Once doses were confirmed to still be available, individuals on the standby list were contacted and informed to go to the site to receive their dose. This strategy also strengthened MPHD's social media presence within the community.

Recommendation:

    N/A.

2.9. Strike Team Operations

This section provides strengths and areas for improvement related to strike team operations activities during the COVID-19 pandemic.

2.9.1. Strength: Strike Team operations and management

Observation: MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration

Analysis: MPHD Strike Teams comprised temporary contract employees who were quickly onboarded to support testing operations. Their role eventually expanded to support vaccination efforts as well. Strike Team members were passionate about serving the communities they worked in every day and could earn trust with community leaders and members. Team members selflessly worked in extreme conditions like rain, snow, and blazing heat, and they rarely complained. Testing and vaccine sites were kept open later to accommodate working families or those who could not get to sites during more traditional hours. Despite the challenges associated with temporary staff, Strike Teams remained well-staffed throughout the pandemic and were flexible enough to meet the needs of community members. From January 4, 2021, to December 30, 2022, Strike Team members administered 39,905 vaccines.

Recommendations:

a. Record Strike Team operating procedures in future pandemic planning.

b. Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.

c. Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

2.9.2. Area for Improvement: Additional translation services available at Strike Team events

Observation: Strike Teams did not always have access to translation services, which would have helped serve the communities in which they were deployed better.

Core Capability: Operational Coordination, Mass Care Services

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: Throughout the pandemic, Strike Teams provided education, testing, and vaccination support for the most underserved communities in Nashville, many who had little or no English. While access to translation services through the Language Line was an option, it was not efficient in face-to-face settings. Many Strike Team members relied on translation applications on personal cell phones or on communication with English-speaking family members. MPHD did add Spanish-speaking translators late in the team's response, but the early addition of a translator at Strike Team events would have been beneficial to building rapport and trust with the communities being served.

Recommendations:

a. Increase recruiting efforts for bi-lingual staff members.

b. Consider incentivizing existing bi-lingual staff members.

    c. Commit to providing translators and translated materials at community testing and vaccine Strike Team events.

2.10. Technology

This section provides strengths and areas for improvement related to technology during the COVID-19 pandemic.

2.10.1. Strength: Metro ITS liaison integration with MPHD

Observation: Early in the response Metro ITS assigned a liaison to MPHD, which greatly helped with assessing MPHD's technical needs.

Core Capability: Operational Communications, Public Information and Warning

PHEP Capability: Emergency Public Information and Warning, Information Sharing

Analysis: Early in the response, MPHD partnered with Metro ITS, who offered a highly trained liaison who integrated into MPHD to assist with MPHD's technical needs. This partnership proved to be critical to the MPHD's early success with communication. The liaison worked with MPHD staff and the IT department to quickly develop technology solutions to key functions such as broadcasting to the public, including closed captions, video conferencing on a large scale, and rapidly establishing MPHD's Hotline. This also made it possible to set up accounts for new employees quickly and get them equipment on the day of hire.

Recommendations:

    a. Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.

    b. Develop operating guides for establishing broadcasting and video conferencing capabilities.

2.10.2. Area for Improvement: RedCap project as Vaccination Scheduler

Observation: RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD developed a RedCap project for COVID-19 vaccination appointments. However, the program was not designed for the volume of appointment requests received, and it had several issues in maintaining operations. Staff were required to constantly monitor the software and release only a designated number of appointments at a time to prevent the program from crashing. The limited availability of appointments caused frustration for patients, and it contributed to perceived delays in accessing vaccines. Although RedCap provided the intended service, it was not the most efficient way to schedule the volume of vaccination appointments that the response required.

Recommendations:

    a. Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.

    b. Coordinate with Metro ITS to explore in-house scheduling solutions that communicate with the MPHD Electronic Health Record System and HIPAA compliant.

2.10.3. Area for Improvement: Case investigations did not utilize RedCap earlier in the case monitoring process

Observation: RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method caused several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In the early stages of case monitoring and contact tracing, MPHD utilizing a Microsoft Excel spreadsheet stored on MPHD's SharePoint page to save monitoring and contact tracing notes. This method had benefits, such as ease of use, and it allowed for simultaneous users. However, SharePoint was slow to load at times, and on several occasions, staff accidently deleted data from the spreadsheet. This required reverting to an older version of the spreadsheet. Eventually, and at the height of the pandemic, the case investigation team developed a RedCap project to capture case and contact data more efficiently and eliminate the need to store data in less-reliable means. Using RedCap was a vast improvement in storing case notes, but it would have been far more beneficial earlier in the response.

Recommendation:

    a. Record the use of RedCap as the initial tool for storing data and build any necessary RedCap projects as early as possible.

2.11. Resources, Procurement, and Supply Chain Management

This section provides strengths and areas for improvement related to resources, procurement, and supply chain management activities during the COVID-19 pandemic.

2.11.1. Strength: MPHD Public Health Emergency Preparedness Logistics Operations

Observation: MPHD PHEP team expertly managed logistical operations throughout the pandemic.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness

Analysis: Through many years of planning and preparation, the MPHD PHEP logistics team could exceptionally support not only MPHD but also several healthcare facilities in Davidson County with the deployment of personal protective equipment (PPE) when other larger government agencies in the state were unable to do so. In addition, the logistics team expertly provided PPE and POD resources to MPHD testing and vaccination PODs for over two years. Standard operating procedures dictated that the PHEP logistics team ordered and stored PPE annually with end-of-year funding. This ongoing practice made PPE available throughout the pandemic. The available PPE included gowns, face shields, gloves, and most importantly, N95 masks. The pre-planning of the MPHD PHEP logistics team helped MPHD respond to the COVID-19 pandemic effectively and protect the lives of the staff and the public.

Recommendation:

    a. Monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to date list of supplies is kept in the PHEP warehouse inventory control program.

2.11.2. Strength: Mask distribution efforts

Observation: MPHD made every effort to provide masks throughout the pandemic response.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: By using drive-thru mask distribution PODs, passive distribution stations at facilities or event entrances and by teams walking through malls or along city streets, MPHD made every effort to provide masks to the residents and visitors of Nashville and Davidson County. MPHD consistently ordered, stored, and delivered masks to staff, facilities, and partners throughout the county. Teams of MPHD staff traveled to high traffic and public areas to hand-deliver masks in the evenings and over the weekend, and they educated the general public about the importance of wearing masks. Based on the Governor's orders, MPHD staff established a mask distribution POD and provided masks to those who formed a line outside of the building. MPHD remained committed to mask distribution efforts throughout the COVID-19 response and recovery efforts.

Recommendation:

> N/A.

2.12. Order Enforcement

This section provides strengths and areas for improvement related to order enforcement activities during the COVID-19 pandemic.

2.12.1. Strength: Online Event Application Process

Observation: MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Using RedCap software, MPHD developed an online private event approval application that was flexible and easy to update as the Mayor's orders altered regulations. Through a series of questions related to the event, the software identified the number of attendees that could attend the gathering. After reviewing a questionnaire, an MPHD team member would have a detailed conversation with event planners to offer guidance or suggestions that could make events safer or potentially allow additional attendees. The seven largest convention hotels in the city followed a separate process in which MPHD teams coordinated with each establishment to make site visits and measure each convention room to establish a pre-planned, pre-determined maximum number of attendees. This was based on event criteria, such as alcohol consumption, seated vs. standing accommodation, and whether attendees were eating. The effort of the MPHD team to develop the event application process safely regulated events citywide and created public trust.

Recommendation:

> a. Capture the online event application process in pandemic planning efforts.

2.12.2. Strength: MPHD Director's Health Order enforcement efforts

Observation: MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD's Environmental Health Department organized a small team of 16 restaurant inspectors who reviewed and responded to daily health order violations reported by the general public on an online reporting tool. Team members contacted business owners to notify them about the reported violation and provided expectations and consultation on how the violator could comply with the health order, as opposed to directly using punitive enforcement. The efforts of MPHD were exceptional, but it was quickly evident that MPHD was not equipped or trained to handle volatile situations that arose in order enforcement situations. Continuing to engage MNPD early in responses of this magnitude is key to ensuring proper and safe enforcement activities.

Recommendations:

    a. Engage response partners, including MNDP, in pandemic planning and Director's Health Order enforcement efforts.

    b. Provide education and guidance to MNPD during Director's Health Order enforcement operations.

2.13. COVID-19 Variants

This section provides strengths and areas for improvement related to COVID-19 variants during the COVID-19 pandemic.

2.13.1. Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community

Observation: With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.

Core Capability: Operational Coordination

PHEP Capability: Emergency Operations Coordination

Analysis: With each COVID-19 variant surge, MPHD quickly altered response activities as needed to best serve the community. MPHD leadership and public information personnel tracked emerging variants and released information to the public using press conferences and social media campaigns, emphasizing the importance of non-pharmaceutical interventions, vaccines, and vaccine boosters. Strike Teams held additional events within communities most affected, and a short notice vaccination POD at Lentz was established on New Year's Eve in 2021. MPHD continued to update and communicate direction on all available platforms in accordance with CDC and Tennessee Department of Health guidance.

Recommendation:

    a. Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.

2.14. Finance

This section provides strengths and areas for improvement related to finance activities during the COVID-19 pandemic.

2.14.1. Area for Improvement: Lack of standardized method to track spending

Observation: Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.

Core Capability: Economic Recovery

PHEP Capability: Community Recovery

Analysis: Stakeholders stated that, in the absence of standardized tracking methods for spending, individuals tracked information such as requisition numbers, purchase order numbers, line-item orders, costs, vendors, and the location where the item was deployed without being directed to do so. Throughout the response, there was not a standardized method of tracking items purchased, and not all items were tracked in the same way. The lack of an established method to track spending could create difficulties in cost recovery and requisition.

Recommendations:

   a. Develop standardized purchasing and tracking processes and train staff on these procedures.

   b. Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.

   c. Incorporate purchasing and tracking of purchasing into RHOC operations during activation.

2.15. Recovery and Demobilization

This section provides strengths and areas for improvement related to recovery and demobilization activities during the COVID-19 pandemic.

2.15.1. Strength: Phased demobilization strategy

Observation: MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Due to lessons learned from conducting demobilization operations too quickly, MPHD developed a demobilization strategy that would slowly end operations using a phased approach. Vaccine and testing operations transitioned primarily to the Strike Teams, with vaccines also being offered in MPHD clinics. The PHEP team assessed supply levels and monitored the return of equipment from the PODs. Warehouse inventory management is an ongoing process that will continue to develop over time.

Recommendation:

   a. Capture demobilization and recovery procedures in pandemic planning efforts.

2.15.2. Area for Improvement: Better public communication about Strike Team demobilization

Observation: Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.

Core Capability: Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning

Analysis: Strike Teams were critical to serving Nashville's most vulnerable populations, and many community members relied on the accessibility offered by their events. However, stakeholders noted that there was an overall lack of communication to communities who depended on the events when Strike Team operations were coming to an end. Strike Team members worked hard to build trust and rapport with the communities they were serving, and the lack of communication could affect a long-term effective relationship between MPHD and these communities.

Recommendation:

    a. Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.

3. Conclusion

The Nashville Metro Public Health Department continues to recover from the COVID-19 pandemic. Due to the magnitude of the response, it is likely recovery efforts will be ongoing for the foreseeable future. This AAR provides key findings that demonstrate strengths for codification as best practices and areas for improvement that can be addressed immediately, which will further improve recovery efforts and future responses. The recovery from COVID-19 cannot be solved by one single entity, and the responsibility is on all of MPHD to address these gaps.

MPHD's greatest strength is the dedication, innovation, and flexibility of its workforce. MPHD is committed to public health and has worked tirelessly to adapt quickly to the changing environment during the pandemic response. Staff worked to balance the needs of the pandemic with the daily and routine commitments in other essential public health services. MPHD has an effective and compassionate workforce that successfully led MPHD during the COVID-19 pandemic, with a sharp focus on health equity and the importance of protecting and reaching the most vulnerable individuals. A shining example of this is the efforts of the Strike Teams to build relationships with community leaders and members of the most underserved parts of the city and for MPHD to ensure the availability of assessment centers and vaccination sites throughout the city and county. Partnerships also developed and strengthened with traditional and non-traditional partners who were crucial to the overall success of MPHD's response. These should be fostered for future public health efforts.

MPHD stakeholders are encouraged to use the findings in this report to further refine recovery efforts related to the COVID-19 pandemic and the plans, procedures, and training needed to support future emergency response efforts. In addition, MPHD is encouraged to consider implementing the practice of completing interim AARs for future lengthy responses similar to the COVID-19 response. The findings of this AAR have been incorporated into the attached Improvement Plan, which will help guide efforts to build on the information identified and analyzed in this report.

Appendix A: Improvement Plan

This Improvement Plan (IP) was developed for the Nashville Metro Public Health Department (MPHD)as part of the after-action review process. Observations and recommendations in the IP were established as a collaborative planning effort with key stakeholders. Areas for Improvement with highlighted recommended actions and corresponding lead agency, agency point of contact, start date, and end date are listed in Table 2. Table 3 of the IP highlights MPHD's strengths with recommended actions for implementation.

Table 2: Improvement Plan – Areas for Improvement

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (a)	AFI: Commitment to utilizing the ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with the department's response approach and did not fully utilize the ICS.	Assign and properly train key primary and alternate Regional Health Operations Center (RHOC) positions.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (b)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Consider cross-training RHOC positions to ensure staff coverage.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (c)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (d)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Establish the role and responsibilities of the Executive Leadership Team (ELT) during response operations.	ELT	Director of Health, Deputy Directory of Health, CDEP Bureau Director, Medical Director	July 1, 2023	Ongoing
2.1.3 (a)	AFI: Enhanced screening of temporary staff candidates	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	Stakeholders noted that need for better screening of temporary staff during operations that required the need for surge staffing.	Develop protocols for screening and hiring temporary and contract employees.	MPHD HR	HR Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.2.2 (a)	AFI: MPHD leadership's communication to staff	Core Capability: Operational Communications, Situational Assessment PHEP Capability: Information Sharing	Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.	Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.	ELT	Director of Health, Deputy Director of Health, Medical Director, Communications Division	July 1, 2023	Ongoing
2.4.8 (a)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.	Establish an internal social work department to partner with case investigations during future large-scale operations.	ELT	Preventative Health Bureau Director, Behavioral Health Program Director	As needed	As needed
2.4.8 (b)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Identify and include community-based organizations that support underserved communities to assist with case management.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.8 (c)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Mature relationships developed during pandemic; include community partners in pandemic planning efforts.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing
2.4.9 (a)	AFI: Communication with the public regarding the TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.	Vaccine Preventable Disease (VPD)	VPD Program Director and Team	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.9 (b)	AFI: Communication with the public regarding the use of TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.	VPD and MPHD PIO	VPD Program Director and Team and MPHD PIO	July 1, 2023	June 30, 2029
2.5.3 (a)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Provide resources to recruit and retain additional bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (b)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.5.3 (c)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider procuring "as needed" contracts for translation services.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (d)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Ensure ample interpreters are available during community events, such as testing and vaccination PODs.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.6.5 (a)	AFI: Increase advertisement efforts for community events	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped to reach more members of vulnerable communities.	Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.	MPHD PIO, Strike Team, Health Equity	MPHD PIO, Strike Team Leader, Health Equity Bureau Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.6.6 (a)	AFI: Consistent promotion of wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Utilize city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029
2.6.6 (b)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.6.6 (c)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.9.2 (a)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Increase recruiting efforts for bi-lingual staff members.	Strike Team, Translation Services	Strike Team Leader, Translation Services Program Director	As needed	As needed
2.9.2 (b)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Consider incentivizing existing bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed
2.9.2 (c)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Commit to providing translators and translated materials at community testing and vaccine strike team events.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.2 (a)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.	Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.	MPHD ITS Bureau	MPHD ITS Bureau Director	July 1, 2023	June 30, 2029
2.10.2 (b)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues due to because of the system's limitations.	Coordinate with Metro ITS to explore in-house scheduling solutions that communicates with the MPHD Electronic Health Record System and are HIPAA compliant.	Metro ITS, MPHD ITS Bureau, MPHD Electronic Health Record	Metro ITS Program Director, MPHD ITS Bureau Director, Electronic Health Record Planning Team Lead	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.3 (a)	AFI: Case investigations did not utilize RedCap earlier in the case monitoring process	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method proved to cause several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.	Record the use of RedCap as the initial tool for storing data during case monitoring and contact tracing operations.	PHEP	PHEP Epidemiolog ist	July 1, 2023	June 30, 2029
2.14.1 (a)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Develop standardized purchasing and tracking processes and train staff on these procedures.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (b)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (c)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Incorporate purchasing and tracking of purchasing into RHOC operations during activation.	MPHD Finance Bureau, PHEP	Finance Bureau Director, PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.15.2 (a)	AFI: Better public communication about Strike Team demobilization	Core Capability: Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning	Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.	Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.	Strike Team, MPHD PIO	Strike Team Leader, MPHD PIO	As needed	As needed

Table 3: MPHD Strengths

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.1.1 (a)	Strength: Quick onboarding of temporary workers for surge staffing	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.	Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/counselors, strike team members.
2.2.1 (a)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Maintain and mature the relationships formed during MPHD's response.
2.2.1 (b)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.	Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.
2.2.1 (c)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Include special interest groups in future public health preparedness drills and exercises.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.1 (a)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.
2.3.1 (b)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercise events.
2.3.2 (a)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notification of positive cases.	Continue to maintain interfacing capabilities for future needs.
2.3.2 (b)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Capture interfacing/query capability in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.2 (c)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Incorporate database interfacing capability into future exercises and drills.
2.4.1 (a)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Record case investigation processes and procedures for future pandemic planning efforts.
2.4.1 (b)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Consider procuring standing contracts with companies on an "as needed" basis for future surge staffing needs.
2.4.2 (a)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.2 (b)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Maintain a list of viable community organizations that were helpful in providing wraparound services and use Wear to Turn in Nashville (WTTIN) as a resource.
2.4.3 (a)	Strength: Epidemiologist communication and coordination with COVID-19 case investigators	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.	Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.
2.4.4 (a)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Capture mass case investigation processes and procedures in future pandemic planning efforts.
2.4.4 (b)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.5 (a)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Consider including an investigator guide as an annex in future pandemic planning efforts.
2.4.5 (b)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Memorialize case investigation processes and best practices for future pandemic planning efforts.
2.4.6 (a)	Strength: Implementation of the TeleTask Texting System	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.	Consider maintaining a mass texting system for other MPHD public health efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.7 (a)	Strength: Development of the Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Train additional staff in the development of content for dashboards and related tools.
2.4.7 (b)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).
2.4.7 (c)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public facing dashboard to track several data points.	Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.5.1 (a)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Due to delays outside MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.
2.5.1 (b)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.
2.5.1 (c)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure ample interpreters are available during community events such as testing and vaccine PODs.
2.5.1 (d)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure new and temporary employees are properly trained on Language Line operations.
2.5.1 (e)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.
2.5.2 (a)	Strength: The MPHD COVID-19 Hotline	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.	Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.1 (a)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city's and county's underserved and diverse communities.
2.6.1 (b)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.
2.6.2 (a)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.
2.6.2 (b)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.
2.6.3 (a)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Develop more robust mutual aid agreements with the Sherriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.3 (b)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Include response partners in future pandemic planning to ensure that fully developed response plans are created.
2.6.4 (a)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.
2.6.4 (b)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	Maintain contracts with transport vendors for future public health events.
2.7.1 (a)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.
2.7.1 (b)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Consider holding assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.7.1 (c)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.
2.7.2 (a)	Strength: Strike Team testing support	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.	Increase efforts to advertise Strike Team testing event locations to reach a larger audience.
2.8.1 (a)	Strength: Multi-agency vaccination efforts	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Medical Countermeasure Dispensing and Administration	Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.	Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.
2.8.2 (a)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.2 (b)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.
2.8.2 (c)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.
2.8.3 (a)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Include a mass POD plan annex in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.3 (b)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Train and exercise mass POD operations.
2.9.1 (a)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Record Strike Team operating procedures in future pandemic planning.
2.9.1 (b)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.
2.9.1 (c)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.10.1 (a)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.
2.10.1 (b)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop operating guides for the establishment of broadcasting and video conferencing capabilities.
2.11.1 (a)	Strength: MPHD Public Health Emergency Preparedness Logistics Operations	Core Capability: Supply Chain Integrity and Security, Planning PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness	The MPHD Public Health Emergency Preparedness (PHEP) team expertly managed logistical operations throughout the pandemic.	To help monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to-date list of supplies is kept in the PHEP warehouse inventory control program.
2.12.1 (a)	Strength: Online Event Application Process	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.	Capture the online event application process in pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.12.2 (a)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Engage response partners, including MNPD, in pandemic planning and Director's Health Order enforcement efforts.
2.12.2 (b)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Provide education and guidance to MNPD during Director's Health Order enforcement operations.
2.13.1 (a)	Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community	Core Capability: Operational Coordination PHEP Capability: Emergency Operations Coordination	With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.	Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.
2.15.1 (a)	Strength: Phased demobilization strategy	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.	Capture demobilization and recovery procedures in pandemic planning efforts.

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Appendix B: After-Action Review Methods

The AAR/IP involved a multi-step process, moving from data collection through establishing the IP. The following overview notes the implementation of the approach.

Step 1: Data Collection

The AAR data collection process used a combination of online surveys, a review of departmental self-assessment documentation, teleconferences, one-on-one outreach, and meeting notes.

Survey Design

MPHD issued a voluntary survey to internal and external response stakeholders that supported MPHD's response to the COVID-19 pandemic. The following survey was issued to response partners on January 31, 2023, using an online survey tool. The survey remained open for 24 days, and 140 survey responses were recorded.

Survey Outline

The purpose of the survey was to gather data related to MPHD's COVID-19 preparedness, response, and recovery efforts. The information from this survey, coupled with interviews and a documentation review, informed this AAR for MPHD.

The questions related to the COVID-19 pandemic are as follows:

Section 1: Survey Respondent Information

- **Data Requested**
  - Name
  - Email
  - Title
  - Jurisdiction, Department, Agency, Organization, or Company Name
  - Please list your incident-specific position or role. If unknown, please describe the incident response or recovery actions you supported.

Section 2: Evaluation of Activities Specific to COVID-19

- **Case Investigation Operations**
  - Rate the ability of the MPHD to effectively investigate COVID-19 cases and provide support to quarantined and isolated individuals with available staffing. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to MPHD's overall Case Investigation operations and staffing concerns. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to MPHD's overall case investigation operations and staffing concerns. (open ended comment box)

- **Contact Tracing Program**

    - Rate the effectiveness of MPHD's COVID-19 contact tracing program and ability to identify barriers and challenges associated with contact tracing. (did not observe, poor, below average, average, above average, excellent)

        - Describe any strengths or best practices you observed related to MPHD's overall management of an effective COVID-19 contact tracing program. (open ended comment box)

        - Describe any areas for improvement or challenges you observed related to MPHD's overall management of an effective COVID-19 contact tracing program.

    - Rate MPHD's contact tracing program in the following area: supported the identification of health inequities or disparities (did not observe, poor, below average, average, above average, excellent)

    - Rate MPHD's contact tracing program in the following area: supported connection to wraparound services (did not observe, poor, below average, average, above average, excellent)

    - Rate MPHD's contact tracing program in the following area: how contact tracing data informed decisions regarding testing and vaccination efforts. (did not observe, poor, below average, average, above average, excellent)

        - Describe any strengths or best practices you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

        - Describe any areas for improvement or challenges you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

- **Isolation and Quarantine**

    - Rate the effectiveness of MPHD's ability to provide education surrounding isolation and quarantine and identify barriers and challenges to isolation and quarantine. (did not observe, poor, below average, average, above average, excellent)

        - Describe any strengths or best practices you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

        - Describe any areas for improvement or challenges you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

- **TeleTask Texting System**

    - Rate the implementation, management, and maintenance of the TeleTask Texting System. (open ended comment box)

        - Describe any strengths or best practices you observed related to the TeleTask Texting System (open ended comment box)

        - Describe any areas for improvement or challenges you observed related to the TeleTask Texting System (open ended comment box)

- **Data Reporting**

    - Rate MPHD's management of data reporting through the data dashboard. (did not observe, poor, below average, average, above average, excellent)

◆ Describe any strengths or best practices you observed related to MPHD's management of data reporting. (open ended comment box)

◆ Describe any areas for improvement or challenges you observed related to MPHD's management of data reporting. (open ended comment box)

- **NBS**

  ▪ Rate the implementation, management, and maintenance of the National Electronic Disease Surveillance System (NEDSS) Base System (NBS) (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to the NBS. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to the NBS. (open ended comment box)

- **RedCap**

  ▪ Rate the implementation, management, and maintenance of the RedCap project. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to the RedCap project. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to the RedCap project. (open ended comment box)

- **Translation Services**

  ▪ Rate MPHD's overall support for verbal Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's overall support for written Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)

- **Language Line**

  ▪ Rate the implementation of the Language Line. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to the Language Line. (open ended comment box)

    ◆ Describe any areas for improvement and challenges you observed related to the Language Line. (open ended comment box)

- **Non-English Printed Materials**

  ▪ Rate the quality and process for obtaining printed materials utilized for case interviews and COVID-19 information packets printed in Spanish, Arabic, and additional languages as well as printed materials obtained from special vendors. (did not observe, poor, below average, average, above average, excellent)

◆ Describe any best practices you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

◆ Describe any areas for improvement or challenges you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

- **Social Services and Human Needs**

  ▪ Rate MPHD's referral to food access programs (to include the grocery delivery program) (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's referral to housing programs. (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's referral to transportation services. (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's referral to health care and insurance programs. (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's referral to mental health services. (did not observe, poor, below average, average, above average, excellent)

  ▪ Rate MPHD's referral to economic support services. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's support to social services and human needs. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to social services and human needs. (open ended comment box)

- **Thermometer Delivery Program**

  ▪ Rate MPHD's overall implementation of the thermometer delivery program. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

    ◆ Describe any areas for improvements or challenges you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

- **Support to Vulnerable and Diverse Populations**

  ▪ Rate MPHD's overall support and services provided to vulnerable and diverse populations during COVID-19 response and recovery. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

    ◆ Describe any areas for improvements or challenges you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

  ▪ Rate MPHD's overall support to incarcerated individuals during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ▪ Rate MPHD's overall support for and services provided to the transient and homeless population during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

- ▪ Rate MPHD's overall support for and services provided to those in long term care facilities during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any strengths or best practices you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

- ▪ Rate MPHD's outreach effort with Siloam and TN Immigrant and Refugee Rights Coalition (TIRRC). (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

- • **Metro Nashville Public Schools**

  - ▪ Rate MPHD's overall support to the Metro Nashville Public Schools (MNPS) in response to and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the support provided to MNPS. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to the support provided to MNPS. (open ended comment box)

- **Hotline/Call Centers**

  - Rate the implementation and overall operations of MPHD's COVID-19 Hotline. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to Hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

- **Testing**

  - Rate MPHD's implementation and maintenance of an effective COVID-19 testing program, including establishment of testing sites that serve under-resourced populations, such as those with limited transportation options, disabilities, or those living in remote or low-income areas. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

- **Assessment Centers – Kmart, Nissan, Meharry**

  - Describe any strengths or best practices you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

  - Describe any areas for improvements or challenges you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

  - Describe any strengths or best practices you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

  - Describe any areas for improvements or challenges you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

  - Describe any strengths or best practices you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

  - Describe any areas for improvements or challenges you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

- **Testing – Strike Team**

  - Rate the overall effectiveness of the MPHD's Strike Team Testing (STT) operations. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- Describe any areas for improvement or challenges you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- **Order Enforcement**

  - Rate the MPHD's overall implementation and maintenance of Order Enforcement during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any areas for improvement or challenges you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any strengths or best practices you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any MPHD strengths or best practices you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe any MPHD areas for improvement or challenges you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe how well you feel MPHD complied with enforcing and implementing orders throughout the pandemic response. (open ended comment box)

- **Supply Chain/PPE**

  - Rate MPHD's ability to support the supply chain, including working with the private sector, and communicating any resource issues and challenges, including providing PPE to healthcare workers. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's management of medical equipment and PPE expiration date monitoring. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

- **Strategic National Stockpile**

    - Describe any strengths or best practices you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

- **Mask Distribution**

  - Rate MPHD's overall implementation and management of mask distribution during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's management of the initial mask distribution to health departments. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

  - Rate MPHD's support to sustained mask distribution efforts at community centers. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD sustained mask distribution efforts at community centers. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's sustained mask distribution efforts at community centers. (open ended comment box)

- **IT and Data Systems**

  - Rate MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    - ◆ Describe any strengths or best practices you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any strengths or best practices you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any strengths or best practices you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvements or challenges you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ▪ Rate MPHD's use of Redcap as the agency's COVID vaccine appointment system. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

- **Vaccination**

  - ▪ Rate MPHD's vaccination program efficacy in the following area: accessibility of vaccine sites. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: reaching the homebound. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: providing targeted, culturally and linguistically responsive public information. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: combating misinformation and vaccine hesitancy. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

- **Vaccination – CORE POD: COVID On-Site Response at East**

  - ▪ Rate MPHD's COVID Onsite Response at East (CORE) vaccination POD (initial vaccine site operated for approximately two months). (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's CORE vaccination POD. (open ended comment box)

    - ◆ Describe any challenges you observed related to MPHD's CORE vaccination POD. (open ended comment box)

- **Vaccination – Strike Teams**

  - ▪ Rate the effectiveness of MPHD's Strike Teams during vaccination operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- **Vaccination – 75+ POD**

  - Rate MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

- **Vaccination – Music City Center**

  - Rate MPHD's support to Music City Center vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

- **Vaccination – Nissan POD**

  - Rate MPHD's support to the Nissan vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

- **COVID-19 Variants**

  - Rate MPHD's ability to manage and adapt to new COVID-19 variants such as Delta and Omicron. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's ability to adapt to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's ability to adapted to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe how future challenges could be mitigated regarding new COVID-19 variants. (open ended comment box)

- **Charlotte Ave Assessment Center – August 2021 Case Surge**

  - Rate MPHD's implementation and management of the Charlotte Assessment Center during the August 2021 Case Surge. (did not observe, poor, below average, average, above average, excellent)

- Describe any strengths or best practices you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- Describe any areas for improvement or challenges you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- **Strike Team Operations**

  - Rate the overall operations including deployment, operations, staffing, equipping, and stand-down of MPHD's Strike Teams during the COVID-19 response. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's Strike Teams' support to vulnerable populations (e.g. homebound, DIDD, LTC, individuals experiencing homelessness, incarcerated individuals, immigrant and refugee population, people of color). (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

- **Health Equity**

  - Rate MPHD's ability to promote health equity during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

    - Describe any areas for improvement you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

- **Finance**

  - Rate MPHD's tracking of spending and awareness of all available funding mechanisms to support effective disaster cost recovery. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's cost recovery program. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's cost recovery program. (open ended comment box)

- **Recovery and Demobilization**

  - Rate MPHD's recovery and demobilization operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- ◆ Describe any areas for improvements or challenges you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

Section 3: Notable Event During the Pandemic Response

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operation during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

- ■ Rate MPHD's overall response performance related to the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - ◆ Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts. (open ended comment box)

  - ◆ List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts. (open ended comment box)

  - ◆ Additional comments. (open ended comment box)

Step 2: Interviews

Based on a list provided by MPHD Public Health Emergency Preparedness (PHEP), critical response staff were given an opportunity to participate in an interview to discuss the overall response, strengths, and areas of improvement. Of the 31 individuals invited to attend, 20 participated in interviews.

Table 4: Participants in Interviews

Interview Representation	#
MPHD	15
Metro Government	4
Response Partners	1
Total	20

The interview questions related to the COVID-19 pandemic were as follows:

- Name:

- Agency:

- In what role(s) did you serve during the COVID-19 Pandemic response?

- Thinking about the entire span of the response (March 2020–December 2022). What processes/systems/tools/plans did your agency implement that you believe improved the response? (e.g., trainings, processes, EOPs, SNS plans, etc.)

- Thinking back to March 2020, what do you wish you knew then that you know now that might cause you to take a different course of action?

- Based on your role and observations, what are three things you believe MPHD did well during the response to COVID-19?

- Based on your role and observations, what are three things you believe MPHD needs to improve for future large-scale responses like COVID-19?

- How would you describe MPHD's ability to provide clear communication and guidance to staff? What could have been improved with the communication provided?

- Describe your experience with the Case Management Leadership Team.

- Describe your role and experiences with the Isolation & Quarantine team. Do you feel that isolation and quarantine guidance was managed effectively?

- Describe your role and experiences with the testing and vaccination processes. Do you feel MPHD managed testing and vaccination programs effectively? Can you highlight any strengths or areas for improvement in this area?

- Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts.

- List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts.

- Additional Comments:

Step 3: Data Analysis

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Survey Response Summary

- The Nashville Metro Public Health Department COVID-19 AAR survey received 140 responses.

Table 5: Overview of Survey Respondents

Representation	#
MPHD Partners	124
Metro Government Partners	3
Community Response Partners	13
Total	140

Survey outputs and interview notes were analyzed and sorted by topic area and similar comments and outputs were consolidated.

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Step 4: Establishing the Improvement Plan

Key observations and associated recommended actions were presented in the AAR and the appended IP. In addition, the IP prioritizes areas for improvement, indicates the agency or organization assigned to lead response to each identified sustainment opportunity and area for improvement, and establishes a timeline for completing associated actions (i.e., start and completion dates). MPHD Public Health Emergency Preparedness (PHEP) will meet with key stakeholders internally to review the IP and assign responsibilities and timelines for implementation.

Step 5: Implementing the Improvement Plan

The IP remains a living tool to help guide the process of addressing areas for improvement and will be used at follow-up meetings to check the status of outstanding areas for improvement and corresponding activities. MPHD PHEP will continue to guide the improvement process, but responsible agencies and organizations will lead the responses to their assigned areas for improvement. MPHD PHEP will establish an accountability process, including meetings as needed to assess progress with appropriate stakeholders.

Appendix C: Partner Agencies

Traditional and non-traditional partnerships formed and strengthened were critical to the success of response and recovery efforts. MPHD partnered with the agencies in Table 6 thorough the response to and recovery from COVID-19.

Table 6: Partner Agencies

Aegis Lab	Music City Center
AEL Lab	Music City Tents
Ascension Health Systems	Nashville Convention and Visitors Corp
Axios	Nashville Fairgrounds
Belmont University School of Nursing	Nashville Fire Department
Belmont University School of Pharmacy	Nashville Predators
Boswell's Golf Carts	Nashville Red Cross
Bridges for Deaf and Hard of Hearing	Nashville Rescue Mission
Bridgestone Arena	National Pan-Hellenic Council of Nashville
Conexion and Casa Azafran	Neighborhood of Health
Congregational Health & Education Network	Office of Emergency Management
Davidson County Sheriff's Office	PathGroup Lab
DVL Seigenthaler	Plaza Mariachi
El Jefe 96.7	Randstad
English Learners Office/Metro Public Schools	Room in the Inn
Exit In	Salvation Army
FEMA Region IV	Siloam
FiftyForward	St. Thomas EMS
Greater St. James Missionary Baptist Church, 28th Avenue	Tennessean
Hands On Nashville	TN Department of Intellectual Developmental Disabilities
HCA	TN Department of Health
hubNashville	TN Emergency Management Agency
Islamic Center of TN	TN Hospital Association
Lee Chapel African Methodist Episcopal Church	TN Immigrant and Refugee Rights Coalition
Maxim	TN Lookout
Mayor's Office	TN National Guard
Metropolitan Development & Housing Agency	TN Titans
Meharry Medical College	The Contributor
Metro Beer Board	Trako Dental & Medical Supply
Metro Finance	United Rentals
Metro General Hospital	US Marshall's Office
Metro General Services	US Forestry Service
Metro ITS	Vanderbilt University Medical Center
Metro Legal	Vanderbilt University School of Nursing
Metro Nashville Airport Authority	WeGo
Metro Nashville Community Centers	Wellpath
Metro Nashville Network	WFSK Radio
Metro Nashville Public Schools	WKRN
Metro Parks	WPLN
Metro Police Dept	WSMV
Metro Public Works	WTVF
Metro Schools Fleet	WZTV
Metro Social Services	

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Appendix D: Incident Timeline

2020 Timeline

- **January 9:** The World Health Organization (WHO) traces Wuhan pneumonia illness to a new coronavirus.[i]

- **January 16:** Tennessee State Health Operations Center is activated due to the rise of COVID-19.[ii]

- **January 17:** The Centers for Disease Control (CDC) and Department of Homeland Security's Customs and Border Protection (CBP) announce public health screenings to be set up at three U.S. airports.[iii]

- **January 30**: The WHO declares the novel coronavirus disease (now designated as COVID-19) a public health emergency of international concern. [iv]

- **January 31**: The Secretary of the U.S. Department of Health and Human Services (DHHS) declares a public health emergency in response to COVID-19.[v]

- **February 11:** The WHO officially announces a name for this new disease as "COVID-19".[vi]

- **February 26:** The CDC confirms possible instance of community spread of COVID-19 in the U.S.[vii]

- **February 27:** MPHD established ICS and activated the RHOC.[viii]

- **February 27:** MPHD has established Incident Command to coordinate response planning for COVID-19 cases in Davidson County.[ix]

- **March 3:** A deadly tornado outbreak affected middle Tennessee on the night of March 2 and continued through the morning of March 3, 2020. A massive EF3 tornado hit and impacted Nashville, leaving 25 people dead. It was the 6th costliest tornado in United States history.

- **March 11**: The WHO declares COVID-19 a pandemic.[x]

- **March 12:** Governor Bill Lee declared state of emergence for Tennessee.

- **March 13**: U.S. President Donald J. Trump declares a national emergency in response to the COVID-19 outbreak.[xi]

- **March 13:** Gov. Bill Lee issues guidance for mass gatherings, schools, state employees, and the State Capitol Building.[xii]

- **March 15:** States in the U.S. begin to announce shutdowns to reduce the spread of COVID-19. Notable examples include New York's public-school system and Ohio's restaurants and bars.[xiii]

- **March 15:** The Metropolitan Board of Health of Nashville and Davidson County declares a public health emergency.[xiv]

- **March 16:** Mayor John Cooper announces the closure of bars and restaurants in Davidson county to slow the spread of COVID-19.[xv]

- **March 17:** The first human trial for a vaccine against COVID-19 begins in the U.S.[xvi]

- **March 17:** Gov. Lee urges all Tennessee school districts to close by March 20 and remain closed until March 31.

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1. Introduction

The Nashville Metro Public Health Department (MPHD) played a critical role in the response to and recovery from the COVID-19 pandemic. Because COVID-19 cases were likely to emerge across Nashville and Davidson County, the MPHD Regional Health Operations Center (RHOC) was activated on February 27, 2020. The objective of the RHOC was to monitor, coordinate, and provide messaging in support of the COVID-19 response.

The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020, and on March 12, Tennessee Governor Bill Lee declared a state of emergency to facilitate a coordinated statewide response. On March 18, Mayor John Cooper issued a state of emergency within metropolitan Nashville and Davidson County, which established temporary restrictions to reduce the spread of the virus, including restrictions on social gatherings and businesses. MPHD swiftly responded by increasing COVID-19 case investigations and contact tracing efforts, coordinating wraparound services for community members, developing Strike Team capabilities to reach vulnerable and underserved communities, establishing a COVID-19 Hotline, and establishing testing and vaccination sites throughout the Metro area.

Approximately 86 agencies and community partner organizations supported MPHD's sustained response efforts, and on December 31, 2022, after 34 months of activation, MPHD deactivated its COVID-19 response. During the activation, MPHD staff selflessly supported the ongoing response and exhibited professionalism and compassion for the citizens of Nashville and Davidson County. From February 27, 2020, through December 28, 2022, Davidson County reported 247,844 confirmed resident cases of COVID-19, resulting in 1,765 deaths. The complete timeline of major events is presented in Appendix D.

COVID-19 affected all facets of the lives of the citizens of Nashville and Davidson County, and it required the most significant sustained response and recovery effort in public health emergency history. This *Nashville Metro Public Health Department COVID-19 After-Action Report (AAR) and Improvement Plan (IP)* is the result of the combined efforts of MPHD and numerous response partners, Metro departments, and community-based and nonprofit organizations that provided valuable input to evaluate strengths and indicate areas for improvement and corrective actions to advance MPHD's response posture.

1.1. Purpose

Due to the magnitude and length of the COVID-19 response and recovery efforts, MPHD determined the need for a comprehensive after-action review of strengths and recommended practices, real-time adaptations and corrections, and areas for improvement during the long-term response to COVID-19. This review represents information gathered during MPHD's emergency response to the COVID-19 outbreak in the 34-month period between February 2020 and December 2022.

1.2. Scope

The impact of the COVID-19 pandemic established the need for an after-action review of lessons learned, strengths, and areas of improvement for response and recovery actions taken from February 27, 2020, through December 31, 2022. This AAR represents information gathered during MPHD's emergency response to and recovery from the pandemic. It may guide future planning prioritization and formalization of planning processes and identify gaps to be addressed by MPHD. The AAR is supported by an Improvement Plan (IP) that prioritizes future actions. It can be found in Appendix A.

1.3. Summary of Findings

This report is a review of coordinated actions between the Nashville MPHD and partner organizations that supported the extended response to and recovery from the COVID-19 pandemic. This AAR included a

review of available incident documentation and pertinent information to develop a baseline of expected emergency response and support procedures. Individual survey responses provided additional information regarding response and recovery activities. Each finding in this AAR is attributed to applicable Federal Emergency Management Agency Core Capabilities and Public Health Emergency Preparedness (PHEP) Capabilities. The IP included in Appendix A: includes associated recommendations, identifies agencies responsible for implementing those recommendations, and estimates timeframes for implementation.

1.3.1. Primary Strengths

The major strengths identified for the MPHD's response to the COVID-19 pandemic are as follows:

- Communication with traditional and non-traditional partners and early establishment of partnership between MPHD, OEM, and Mayor's Office

- The COVID-19 case investigations leadership team and wraparound services provided to the citizens of Nashville and Davidson County

- MPHD support for individuals experiencing homelessness

- Music City Center and Nissan Stadium Vaccination PODs

- Strike Team Operations

- Public Health Emergency Preparedness Logistics Operations

1.3.2. Primary Areas for Improvement

The primary areas for improvement and recommended actions identified for MPHD's response to the COVID-19 pandemic are as follows:

- Commitment to utilizing the Incident Command Structure (ICS) and improvement in internal ICS training

- MPHD leadership communication with staff

- Incorporation of social work component into large scale case investigation operations

- Consistent promotion of wellness and mental health resources for MPHD staff

Table 1 summarizes the strengths and areas for improvement, which are detailed in the analysis section.

Table 1: Summary of Strengths and Areas for Improvement

Reference	Topic	Strengths	Areas for Improvement
2.1	Operational Coordination and Structure	Quick onboarding of temporary workers for surge staffing	Commitment to utilizing the Incident Command Structure
			Enhanced screening of temporary staff candidates
2.2	Operational Communication	Communication with external partners	MPHD leadership communication with staff
2.3	Multi-Agency Coordination	Early establishment of working relationships between MPHD, OEM, and Mayor's Office	N/A

Reference	Topic	Strengths	Areas for Improvement
		Partnership with Nashville Department of Emergency Communications in development of COVID-19 query project	
2.4	Epidemiologic Response	COVID-19 case investigation operations	Establishment of a social work component during the course of large-scale case investigations
		Wrap around services provided during COVID-19 case investigations	
		Epidemiologist communication and coordination with COVID-19 case investigators	
		Separate case investigation and contact tracing teams	
		COVID-19 case investigation training	
		Implementation of the TeleTask Texting System	
		Development of Davidson County COVID-19 Dashboard	Communication with public regarding the use of the TeleTask Texting System and timeliness of use
2.5	Public Information	Translation Services	Availability of translators
		MPHD COVID-19 Hotline	
2.6	Social Services and Human Needs	Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Increase advertisement efforts for community events
		Community Health Worker Program	Consistent promotion of wellness and mental health resources for MPHD staff
		Support for incarcerated individuals	
		Support for individuals experiencing homelessness	
2.7	COVID-19 Testing	COVID-19 assessment center accessibility	N/A
		Strike Team testing support	
2.8	COVID-19 Vaccination	Multi-agency vaccination efforts	N/A
		Music City Center and Nissan Stadium Vaccination PODs	
		POD Planning Team	
		Vaccination standby list	
2.9	Strike Team Operations	Strike Team operations and management	Additional translation services available at Strike Team events
2.10	Technology	Metro ITS liaison integration with MPHD	RedCap project as Vaccination Scheduler

Reference	Topic	Strengths	Areas for Improvement
			Case investigations did not utilize RedCap earlier in the case monitoring process
2.11	Resources, Procurement, and Supply Chain Management	MPHD Public Health Emergency Preparedness Logistics Operations	N/A
		Mask distribution efforts	
2.12	Order Enforcement	Online event application process	N/A
		MPHD Director's Health Order enforcement efforts	
2.13	COVID-19 Variants	MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community	N/A
2.14	Finance	N/A	Lack of a standardized method to track spending
2.15	Recovery and Demobilization	Phased demobilization strategy	Improved public communication for Strike Team demobilization

2. Analysis

This section reviews the major strengths and areas for improvement identified in the AAR process. Each observation is presented as a strength or an area for improvement, identifies associated core capabilities, is based on observations documented through the data-collection process, and, if appropriate, presents recommendations that are specific and actionable. The observations are presented in 15 sections, as shown in Figure 1.
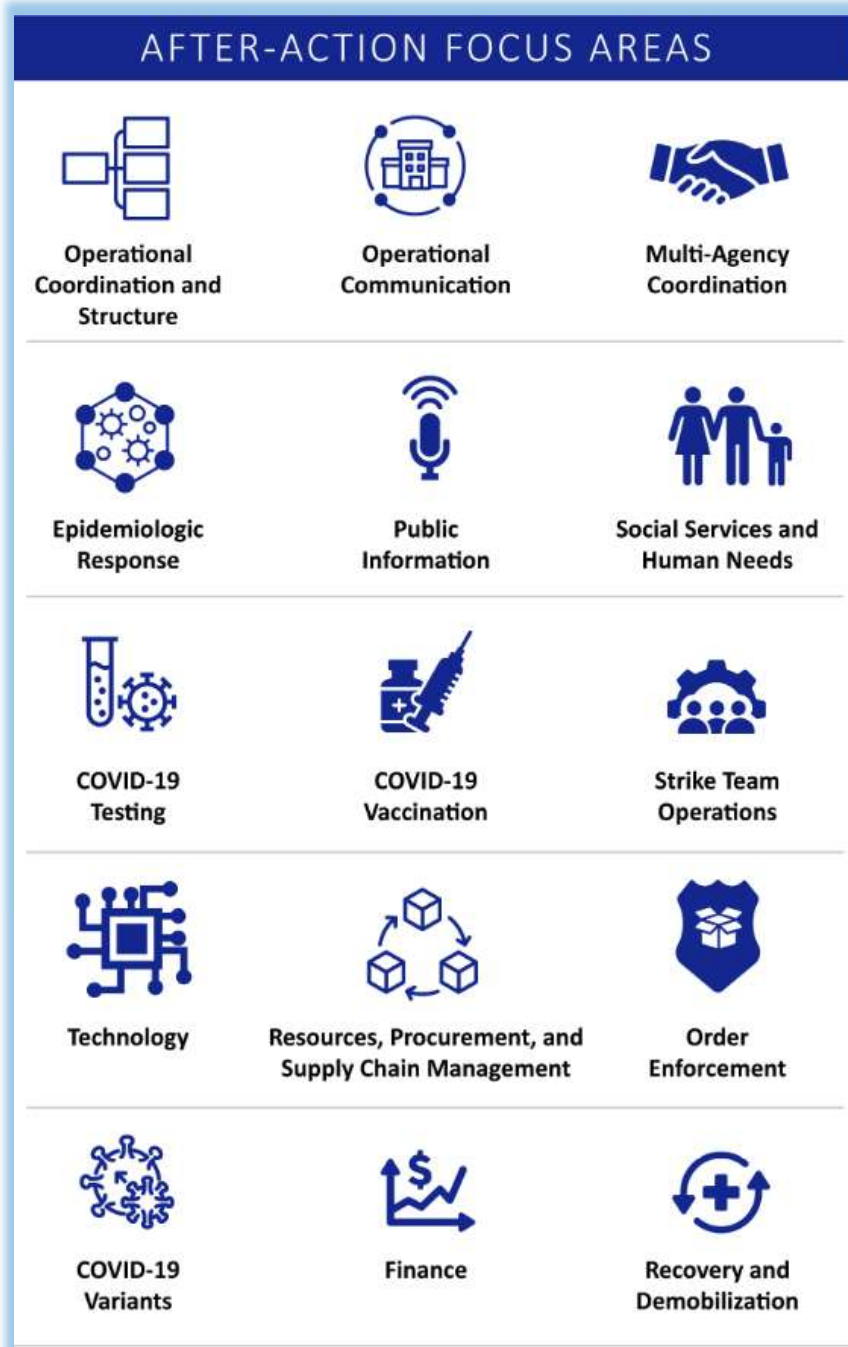

Figure 1: After-Action Focus Areas

2.1. Coordination and Structure

This section provides strengths and areas for improvement related to operational coordination and structure activities during the COVID-19 pandemic.

2.1.1. Strength: Quick onboarding of temporary workers for surge staffing

Observation: MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: Staffing throughout the pandemic was a concern, but MPHD management and RHOC staff coordinated extremely well with recruiters, staffing agencies, and HR staff to quickly on-board temporary staff members to fill positions in roles throughout MPHD. During peak hiring, HR onboarded up to 15 temporary staff members daily. To streamline the onboarding process, during the new hire background check wait times, HR worked to complete the necessary paperwork and information technology (IT) requirements with new staff prior to the start dates. Temporary staff were utilized to quickly provide additional support to the case investigations team and to provide staffing to develop the strike teams. Both operations were crucial to MPHD's ability to serve the most vulnerable populations of the city and county.

Recommendation:

a. Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/ counselors, strike team members.

2.1.2. Area for Improvement: Commitment to utilizing the Incident Command System (ICS) during response operations

Observation: Stakeholders noted that throughout the response, MPHD leadership was not consistent with MPHD's response approach and did not fully utilize the ICS.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination, Community Preparedness

Analysis: While MPHD utilized some components of the ICS during its response to COVID-19, many stakeholders noted that throughout the response, MPHD leadership was not consistent with their approach and did not fully embrace the ICS. This led to reinventing processes that were already established and created an overall lack of direction. In addition, several stakeholders noted that the lack of a cohesive response structure contributed to internal communication breakdowns and greatly influenced the sharing of information both internally and with the public, which further contributed to public mistrust. Affirming a commitment to utilizing the ICS will give MPHD a standardized incident management structure that can be tailored to match the complexities of any incident and give stakeholders clear response leadership and guidance.

Recommendations:

a. Assign and properly train key primary and alternate RHOC positions.

b. Consider cross-training RHOC positions to ensure staff coverage.

c. Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.

d. Establish the roles and responsibilities of the Executive Leadership Team (ELT) during response operations.

2.1.3. Area for Improvement: Enhanced screening of temporary staff candidates

Observation: Stakeholders noted the need for better screening of temporary staff during operations that required surge staffing.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: The use of temporary staff was crucial to the success of MPHD's response and recovery to COVID-19. MPHD's management and RHOC staff, along with recruiters, staffing agencies, and HR professionals, worked tirelessly to fill roles in the most critical mission sets as efficiently and effectively as possible. Challenges were expected with the employment of so many temporary staff. Although the process to onboard staff was accelerated because of the situation was mostly positive, it was noted that in the future, care should be taken to better screen candidates.

Recommendation:

a. Develop protocols for screening and hiring temporary and contract employees.

2.2. Operational Communication

This section provides strengths and areas for improvement related to operational communication activities during the COVID-19 pandemic.

2.2.1. Strength: Communication with external partners

Observation: MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.

Core Capability: Operational Communications, Planning

PHEP Capability: Community Preparedness, Emergency Operations Coordination

Analysis: Almost immediately, MPHD held conference calls with Metro department leads and area hospitals to coordinate response actions. In addition, special interest groups, including religious leaders, childcare providers, Metro Nashville Public Schools (MNPS), the visitor's bureau, and the airport were contacted quickly. These reoccurring calls provided the opportunity for partners to establish clear lines of communication, set expectations for the response, identify community needs, and provide accurate information for partners to share with their networks.

Recommendations:

a. Maintain and mature the relationships formed during MPHD's response.

b. Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.

c. Include special interest groups in future public health preparedness drills and exercises.

2.2.2. Area for Improvement: MPHD leadership's communication to staff

Observation: Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.

Core Capability: Operational Communications, Situational Assessment

PHEP Capability: Information Sharing

Analysis: Many staff noted the lack of communication and transparency from MPHD leadership, particularly in the early stages of the response. Much of the information flow was received via second or third parties or rumors. This lack of communication led to frustration throughout MPHD. Some staff indicated that information was received via press conferences or news outlets instead of via internal leadership chains. As changes in leadership occurred, improvements in communication were noted. However, internal communication was not a perceived priority for MPHD leadership throughout the response.

Recommendation:

    a.   Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.

2.3. Multi-Agency Coordination

This section provides strengths and areas for improvement related to multi-agency coordination activities during the COVID-19 pandemic.

2.3.1. Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office

Observation: Frequent coordination and communication between MPHD, the Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD, OEM, and the Mayor's Office coordinated weekly or as needed to develop operational consistency. This helped to focus MPHD's efforts and enabled a more effective response for all agencies. Prior to the pandemic, communication between the agencies rarely occurred. MPHD, OEM, and the Mayor's Office have now formed a strong partnership and continue to develop that relationship post-response.

Recommendations:

    a.   Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.

    b.   Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercises.

2.3.2. Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project

Observation: MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD provided DEC with a daily count of positive COVID-19 cases in the Metro Nashville jurisdiction, including each case's home address. Initially, the data were manually entered into DEC's dispatch system. However, with the volume of daily cases, DEC technicians quickly became overwhelmed and struggled to keep up with data entry. Manual entry lasted approximately 2–4 weeks until it was possible to link MPHD's and DEC's databases. This eliminated the need to manually enter data, and it provided real-time information to DEC. DEC coordinated with Motorola to build a simple query that would notify the emergency dispatcher when a positive COVID-19 case was reported at the address where first responders were being dispatched. Dispatch codes were used to ensure patient privacy and remain in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA). This simple tool ensured that first responders remained safe and were taking proper safety precautions when responding to emergency calls. The interface between the databases was deactivated on April 12, 2021, but it can be reactivated if needed.

Recommendations:

   a. Continue to maintain interfacing capabilities for future needs.

   b. Capture interfacing/query capability in future pandemic planning efforts.

   c. Incorporate database interfacing capability into future exercises and drills.

2.4. Epidemiologic Response

This section provides strengths and areas for improvement related to epidemiologic response activities during the COVID-19 pandemic.

2.4.1. Strength: COVID-19 case investigation operations

Observation: The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In March 2020, four epidemiologists from MPHD began case investigations and quickly expanded the team by using both internal Metro employees and temporary staff to assist with hundreds of daily COVID-19 cases. The case investigations team eventually grew to over 40 investigators who interviewed cases following epidemiological protocols and connected cases with community resources to assist them with their needs while in isolation. The MPHD case investigations team handled a massive number of COVID-19 cases and managed an enormous amount of data. Their data allowed MPHD to review case clusters throughout the city in a timely manner and provide updates to MPHD and city leadership as required. Throughout the response, the case investigations team continuously improved processes even as the required databases and protocols frequently changed. Nashville and Davidson County experienced one of the highest COVID-19 case counts in Tennessee, and the dedication and leadership of the case investigation team made this operation one of the most successful in MPHD.

Recommendations:

    a. Record case investigation processes and procedures in future pandemic planning efforts.

    b. Consider procuring standing contracts with companies on an "as-needed" basis for future surge staffing needs.

2.4.2. Strength: Wraparound services provided during COVID-19 case investigations

Observation: As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the course of case investigations, the team offered to connect patients with community resources while in isolation. Resources such as thermometer delivery, meal delivery through partnership with Second Harvest, and mental health services were provided to assist those who were in isolation. A great deal of resources, time, and empathy were given to every case that required additional attention and support. This outreach service was the only one of its kind in the region, and it compassionately served the citizens of Nashville and Davidson County.

Recommendations:

    a. Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

    b. Maintain a list of viable community organizations that were helpful in providing wraparound services and use Where to Turn in Nashville (WTTIN) as a resource.

2.4.3. Strength: Epidemiologist communication and coordination with COVID-19 case investigators

Observation: Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation leadership team conducted weekly meetings to share information and updates from the Centers for Disease Control and Prevention (CDC) and the Tennessee Department of Health, answer investigator questions, and gather information regarding clusters and other trends throughout the city and county. Prior to the meeting, case investigators submitted questions or concerns to the epidemiology leadership team to better prepare for and address the issues that were of most concern. Moreover, a member of the epidemiology team was always available to address time-sensitive issues or emergencies that arose. The team also provided weekly email updates with links and background information to help investigators stay up to date on COVID-19 and pandemic guidance. Daily operations were also effectively and efficiently managed by the epidemiology team by assigning cases to investigators each morning as opposed to investigators assigning themselves cases.

Recommendation:

    a. Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.

2.4.4. Strength: Separate case investigation and contact tracing teams

Observation: MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care

Analysis: Surge staffing enabled team leadership to establish a separate contact tracing element that contacted only individuals in quarantine who had been exposed to a confirmed case, while the case investigations team monitored cases in isolation. This contact tracing team took a great deal of burden off epidemiologists, who might have been required to make multiple calls for one case if they were also required to monitor contacts. The contact tracing team enabled MPHD to provide contacts with essential monitoring attention. This included access to wraparound serves and free thermometer delivery if needed, since temperature monitoring was a way to determine if a close contact was becoming a case. Staffing for the case investigation and contact tracing teams eventually surged to over 150 people, and they were integral to MPHD's operations.

Recommendations:

    a. Capture mass case investigation processes and procedures in future pandemic planning efforts.

    b. Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

2.4.5. Strength: COVID-19 case investigation training

Observation: Training was the key to the success of MPHD's COVID-19 case investigation operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation team was staffed with both MPHD internal staff and temporary surge staff with diverse professional backgrounds. Due to this, the case investigation epidemiologist leadership team developed COVID-19 investigation for team members who were less experienced with epidemiological protocols, case monitoring, and contact tracing procedures. The training was initially provided in person. Later, it was combined with an "investigator guide" that could be referenced later and provided investigators with helpful tools for completing investigations effectively. The training helped set expectations and provided material for investigators to become familiar with processes and procedures for case investigation. Guidance was updated, and investigators were briefed as case and contact monitoring guidance changed.

Recommendations:

    a. Consider including an investigator guide as an annex in future pandemic planning efforts.

    b. Memorialize case investigation processes and best practices for future pandemic planning efforts.

2.4.6. Strength: Implementation of the TeleTask Texting System

Observation: Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: At the height of COVID-19 case investigations, MPHD was receiving thousands new cases weekly, which made it nearly impossible to reach all cases and their associated contacts. Implementing the TeleTask Texting System helped make this a more manageable process by providing automated texts to the parties. Such texts would be sent to a positive case and the case's provided contacts. Included in the text was a survey with an abbreviated version of the questions asked by case investigators when contacted directly (see Figure 2). The data from the automated TeleTask survey was directly integrated into MPHD systems, which seamlessly collected the required information and demographics. The TeleTask texts could be translated into Spanish and Arabic and were integral to mass data collection efforts during increased caseloads.
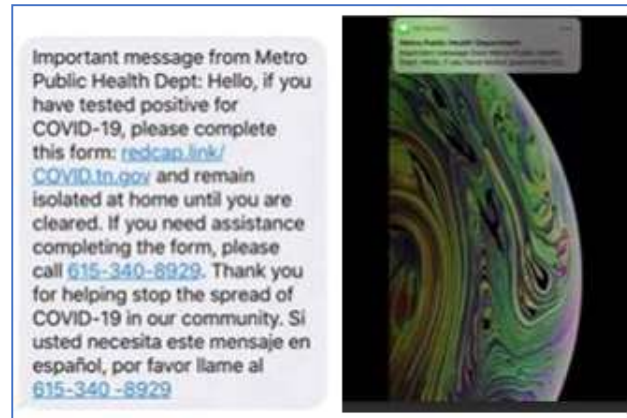

Figure 2: Sample TeleTask Message

Recommendation:

    a. Consider maintaining a mass texting system for other MPHD public health efforts.

2.4.7. Strength: Development of the Davidson County COVID-19 Dashboard

Observation: In partnership with Metro Information Technology Services (ITS), MPHD utilized in-house expertise to create a public facing dashboard to track several data points.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning

Analysis: In conjunction with Metro ITS, MPHD developed a public facing COVID-19 GIS data dashboard, which allowed stakeholders to observe trends during the pandemic response and recovery. Data included case counts, historical data, hospitalizations, mortality, and testing. The dashboard also informed MPHD and city leadership by providing insight to quickly make decisions, with the data being analyzed and reported by skilled epidemiologists. At times, pressure from leadership made data analysis difficult and stressful on the already overtasked staff. However, this dashboard helped to make data reporting consistently accurate and robust. Information was reported daily, weekly, and eventually on a monthly basis until December 28, 2022, when the dashboard was archived for historical purposes.

Recommendations:

    a. Train additional staff in the development of content for dashboards and related tools.

    b. Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).

    c. Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Figure 3: Davidson County COVID-19 Dashboard

2.4.8. Area for Improvement: Establishment of a social work component during large-scale case investigations

Observation: The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the case investigations, MPHD investigators quickly realized that to serve the citizens of Nashville and Davidson County better, their physical and mental needs required support, particularly in the early stages of the pandemic when isolation protocols were unfamiliar and public anxiety was high. Community resources were key to ensuring that individuals' needs were best served, but case investigators were not equipped or trained to easily provide direction on accessing those services. Case investigators invested a great deal of time to familiarize themselves with community resources to which cases could be referred. Cases that were expected to take only 20 minutes could quickly become day-long case management situations, which put massive stress on an already overtasked team. Later in the response, MPHD partnered with community organizations that helped to provide easy access to resources. However, the diverse needs of the community would have been better served with internal access to licensed and trained social workers or counselors familiar and in touch with community resources who could assist the case investigation team during large-scale operations like COVID-19.

Recommendations:

a. Establish an internal social work department to partner with case investigations during future large-scale operations.

b. Identify and include community-based organizations that support underserved communities to assist with case management.

c. Mature relationships developed during pandemic; include community partners in pandemic planning efforts.

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2.4.9. Area for Improvement: Communication with the public regarding the TeleTask Texting System and timeliness of use

Observation: The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number of cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: Although the TeleTask Texting System was immensely helpful, there was some confusion with the public as to what the text meant or why they were receiving it. Stakeholders stated that people believed that the text was spam and an attempt to gain personal information, so many deleted it without providing the requested information. Moreover, implementing the TeleTask Texting System took longer than optimal because of the need to ensure that the messages sent and received would be HIPPA compliant. While the TeleTask Texting tool was helpful, it would have been valuable much earlier in the response when MPHD received an unmanageable number of cases each day.

Recommendations:

   a. Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.

   b. Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.

2.5. Public Information

This section provides strengths and areas for improvement related to public information activities during the COVID-19 pandemic.

2.5.1. Strength: Translation Services

Observation: MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: MPHD used several sources to provide verbal and written translations. In-house Spanish and Arabic translation teams efficiently translated vital medical documents, marketing information, education materials, and testing and vaccination flyers; updating ever-evolving guidance; and assisting at community events and with case investigations. Vendor services were used to translate languages outside of Spanish and Arabic, including Zomi, Swahili, Somali, Napali, Karen, and Burmese.

Figure 4: COVID-19 Protect Yourself Social Media Infographic in Burmese

With the help of translation services, MPHD's Social Media Coordinator designed infographics in multiple languages for social media campaign efforts. The case investigations team and the Strike Teams also had access to the Language Line to further expand translation capabilities. It was noted that, at times, translated printed materials were often delayed.

Recommendations:

   a. Due to delays outside of MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.

   b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

   c. Ensure ample interpreters are available during community events, such as testing and vaccine PODs.

   d. Ensure new and temporary employees are properly trained on Language Line operations.

   e. Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.

2.5.2. Strength: The MPHD COVID-19 Hotline

Observation: Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: During the early stages of the response, MPHD coordinated with both Metro ITS and MPHD ITS to stand up a call center to receive calls from the general public on the MPHD COVID-19 Hotline. Just-in-time training was quickly developed so call center staff cold provide the most current information to callers. Hotline leadership provided a calming confidence that enabled staff to easily pivot based on daily reports or frequent changes to guidance. Call center staffing was primarily sourced from MPHD school nurses and in-school dental staff; it surged to 12 operators and one supervisor. To ensure consistent messaging, a hotline script was developed that was user-friendly, clear, and concise. It provided information on available resources and answers to frequently asked questions, which were updated often. As the general public became more familiar with COVID-19 procedures and testing operations were opened throughout the city, calls began to decrease. In October 2020, the COVID-19 Hotline transitioned outside of MPHD and over to hubNashville.

Recommendation:

   a. Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

2.5.3. Area for Improvement: Availability of Translators

Observation: MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: It was noted that, at times, there were not enough translators to keep up with the volume of translation services requested. Translators were not always available during case investigations, contact tracing, Strike Team events, and other community events.

Recommendations:

a. Provide resources to recruit and retain additional bi-lingual staff members.

b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

c. Consider procuring "as needed" contracts for translation services.

d. Ensure ample interpreters are available during community events, such as testing and vaccination PODs.

2.6. Social Services and Human Needs

This section provides strengths and areas for improvement related to social services and human needs activities during the COVID-19 pandemic.

2.6.1. Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations

Observation: MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Using data-driven decisions obtained through contact tracing and other surveillance methods such as tracking COVID-19 hotspots, MPHD prioritized responses to the region's most vulnerable populations. Community partners, such as the Tennessee Immigration and Refugee Rights Coalition (TIRRC) and Siloam and community leaders, were engaged to help MPHD reach the most vulnerable community members. When testing and vaccines were available, MPHD located testing and vaccination sites in communities throughout the county that might have been disproportionately affected by COVID-19. Teams from MPHD engaged vulnerable populations, including inmates, individuals experiencing homelessness, the elderly, those considered high-risk, and minority populations. MPHD teams also identified the need to support these groups where they were. Teams traveled to jails, assisted living facilities, half-way houses, shelters, places of worship, hospitals, and public areas to offer services. Homebound services were also offered to individuals who could not travel to vaccination sites because of limited mobility or other circumstances. Throughout the response, MPHD staff demonstrated professionalism and compassion toward the city and county's most at-risk groups.

Recommendations:

a. Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city and county's underserved and diverse communities.

b. Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.

2.6.2. Strength: Community Health Worker Program

Observation: MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD partnered with Siloam Health to provide at least three weeks of follow-up care for patients who met certain criteria and were referred to the Community Health Worker (CHW) program. A CHW was a member of the patient's community who could communicate with the patient utilizing the patient's spoken and written language. CHWs provided wraparound services with the long-term goal of successfully completing isolation. CHWs helped patients access resources, including health insurance, food, housing, quality care, and health information while ensuring that health conditions were understood, and strategies were in place to improve the patient's overall wellbeing. All wraparound services were delivered using culturally and linguistically appropriate terminology and concepts. CHWs provided informal counseling, support, and follow-up. When necessary, they connected patients with MPHD for further services. The CHW's highest priorities were to establish trust with the individuals with whom they were working and to collaborate with MPHD monitors and investigators to best serve the patient.

Recommendations:

   a. Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.

   b. Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.

2.6.3. Strength: Support for incarcerated individuals

Observation: Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Early in MPHD's response, MPHD recognized the need to quickly develop just-in-time training for Strike Team members to deploy to Metro jails to provide education, contact tracing, isolation and quarantine guidance, planning, testing, and vaccination services to Davidson County inmates. Despite the potential for a catastrophic disaster, MPHD's correctional health team worked diligently to best support this unique population until April 2022, when support services were fully turned over to a third-party contractor.

Recommendations:

   a. Develop more robust mutual aid agreements with the Sherriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

   b. Include response partners in future pandemic planning to ensure that fully developed response plans are created.

2.6.4. Strength: Support for individuals experiencing homelessness

Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: In partnership with Nashville OEM and Metro Social Services and without existing city plans, MPHD dedicated an abundance of resources to ensure that the unique needs of individuals experiencing homelessness were met. For those displaced by the pandemic, shelter services were quickly established at the fairgrounds and the Brick Church Pike Shelter. In addition, clean and safe non-congregate isolation and quarantine spaces were provided through collaboration with the Nashville Rescue Mission and Room in the Inn. MPHD also worked with the Homeless Impact Division and other community partners to

provide equitable care for the homeless community by arranging for transportation to and from the hospital and providing testing and vaccination events specifically targeted toward individuals experiencing homelessness. Strike Teams traveled to established homeless and transient camps to provide testing and vaccination services, often returning to ensure subsequent doses of the COVID-19 vaccine were administered to individuals. The constant presence of MPHD staff helped to build trust with transient communities and those experiencing homelessness.

Recommendations:

    a. The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.

    b. Maintain contracts with transport vendors for future public health events.

2.6.5. Area for Improvement: Increase advertisement efforts for community events

Observation: More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped reach more members of vulnerable communities.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD and the City of Nashville prioritized vulnerable and underserved communities with countless resources and wraparound services throughout the pandemic. Dedicated staff worked tirelessly to serve the city and county's most vulnerable populations, but there was a lack of citywide cohesive response efforts to serve these communities. At times, this limited the visibility of the resources that *were* available. Future responses should include efforts to coordinate with city and county departments and community-based organizations to ensure that vulnerable communities have better visibility on available resources and events designed to support them.

Recommendation:

    a. Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.

2.6.6. Area for Improvement: Consistent promotion of wellness and mental health resources for MPHD staff

Observation: More mental health wellness resources are needed for MPHD staff when activated for sustained complex response operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD staff were activated on February 27, 2020, when MPHD initially stood up COVID-19 response operations. They did not officially stand-down pandemic response operations until December 31, 2022. Through 34 months of the pandemic response, many staff in MPHD worked nonstop. While dedicated to the success of MPHD's response, many positions had limited trained staff available to backfill roles, which resulted in fatigue and frustration. Many stakeholders noted that the availability of mental health support was not adequate to support the long-term well-being of staff in MPHD.

Recommendations:

    a. Use city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation.

    b. Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation.

    c. Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.

2.7. COVID-19 Testing

This section provides strengths and areas for improvement related to COVID-19 testing activities during the COVID-19 pandemic.

2.7.1. Strength: COVID-19 assessment center accessibility

Observation: Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Assessment centers were established throughout the city to ensure widespread access to COVID-19 testing for all community members. Assessment center types and locations were diverse, with flexible operating hours to accommodate as many residents as possible. The city maintained three large drive-thru assessment centers: Kmart, Nissan, and Meharry. These sites could accommodate large numbers of people and provide regular testing throughout the city. To ensure health equity, assessment centers were strategically placed throughout Davidson County in areas that would provide easy access to vulnerable and underserved populations. In addition, Strike Teams provided testing capabilities to communities that might have difficulty traveling to testing sites. COVID-19 assessment center operations were a true community effort, with several organizations coordinating to serve the residents of Nashville and Davidson County expertly and compassionately.

Figure 5: Nissan Assessment Center

Recommendations:

    a. Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.

    b. Hold assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

    c. Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.

2.7.2. Strength: Strike Team testing support

Observation: MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Throughout 2020, when COVID-19 testing became available, Strike Teams hosted testing events 7 days per week, often with extended hours outside of 8 am to 5 pm, to accommodate the working populations. Teams also established a few standing testing events each week, so community members were aware of the locations to receive needed or desired testing. In addition, Strike Team members were heavily connected with community leaders and partners, reaching out to inquire about recommended testing locations within the community. Teams were consistently available and were rarely unable to accommodate a request for a testing event. Strike Teams were flexible, accommodating, and innovative in providing testing services to vulnerable populations.

Recommendation:

a. Increase efforts to advertise Strike Team testing event locations to reach a larger audience.

Figure 6: Strike Team supporting Lentz pop-up drive-thru testing event on New Year's Eve 2021

2.8. COVID-19 Vaccination

This section provides strengths and areas for improvement related to COVID-19 vaccination activities during the COVID-19 pandemic.

2.8.1. Strength: Multi-agency vaccination efforts

Observation: Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, the Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: The partnership between MPHD and supporting organizations to distribute and provide vaccines in the population centers throughout the city executed a well-coordinated and effective strategy. The efforts to remove obstacles for access included mass drive-thru and walk-in PODs, Strike Team pop-up events in underserved communities, home visits for community members who could not access vaccination events, translation services, and multiple communication mechanisms to inform the public of events taking place throughout the city and county.

Recommendation:

    a. Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.

2.8.2. *Strength:* Mass vaccination PODs at Music City Center and Nissan Stadium

Observation: With the support of community partners, MPHD planned and managed mass vaccination PODs at Music City Center (MCC) and Nissan Stadium, which were highly successful in providing residents with COVID-19 vaccines.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management

Analysis: The MCC vaccination POD was a monumental undertaking led and operated by MPHD in collaboration with several community partners, including MCC staff, Hands On Nashville, OEM, and Metro Parks. The MCC POD opened on January 30, 2021, to begin administering the Pfizer vaccine to people 75 and older and those that qualified in 1a1. People were required to have an appointment to receive the vaccine. Parking was free in nearby parking structures, and there was a complimentary shuttle to the POD entrance. Hands On Nashville volunteers assisted with wheelchair access, and they directed patients to appropriate vaccination lines for quick and efficient processing. The MCC POD was well organized and expertly managed, and it received praise from all involved stakeholders, partner agencies, and the general public. The Music City Center POD was in operation until May 28, 2021, and it administered 107,366 free vaccine doses.

The Nissan Stadium POD was a one-day drive-thru vaccination event planned in 18 days by dedicated MPHD staff members, and it was a true model of community care. MPHD's employees volunteered to help staff the POD, along with the support of local community partners ranging from Metro police and fire departments, the Nashville Department of Transportation, Hands On Nashville volunteers, the Tennessee National Guard, and personnel from Bellmont Nursing and Pharmacy Schools and the Vanderbilt Nursing School. Routes and traffic control plans, along with proper signage, helped maintain the flow of traffic and prevented traffic from impacting areas near the venue. Furthermore, many in the community were made aware of the event through extensive media coverage and having several local news outlets on site. The whole community, alongside MPHD, stepped up to ensure that people were vaccinated in a timely, organized, and efficient manner. This event proved to be a massive success for the city and MPHD, and it resulted in 10,107 vaccines given in a single day.

Figure 7: MPHD Mass Vaccination POD at the Music City Center

Figure 8: POD at Nissan Stadium

Recommendations:

a. Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

b. Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.

c. Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.

2.8.3. Strength: MPHD Vaccination POD Planning Teams

Observation: With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.

Core Capability: Planning

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: Subject matter experts from MPHD planned the vaccination PODS at both MCC and Nissan Stadium in a short timeframe and with limited guidance. Their efforts created extensive plans that included coordination with multiple community partners, detailed traffic and crowd flow, consideration for vulnerable populations and those with access and functional needs, media engagement, and follow -on education. The Nissan Stadium POD, which was planned and executed in 18 days, provided Johnson & Johnson vaccine to culminated with over 10,000 Davidson County residents in one day receiving the Johnson & Johnson shot. The MCC POD operated in downtown Nashville for four months. The planning team expertly designed the MCC's operations in 8 days. The MCC POD administered over 100,000 Pfizer doses, including booster doses. The expertise, innovation, and dedication of the MPHD planning teams were integral to the success of the mass vaccination PODs at MCC and Nissan Stadium.

Additionally, the planning and logistical efforts of the PHEP Department largely influenced the Nissan and MCC PODs and contributed to their successes. Before operations at MCC and Nissan Stadium, the MPHD site (Lentz) was used to provide vaccines to the elderly (those in Tier 1). Because this was a more vulnerable population, MPHD staff attempted to maintain social distancing among patients while keeping them out of the frigid temperatures, since the PODs were being held in January 2021. The PHEP team planned the flow of the POD, set up multiple vaccination stations inside, set up a waiting area in the lobby, and allowed for ingress and egress so the maximum number could wait inside both before and after their vaccine. PHEP also developed a traffic flow plan that enabled people to park and wait in their cars and then be released on a first in–first out basis. Also, there was the added benefit of doing this POD at MPHD's home base. This experience gave MPHD guidance for future PODs at Lentz, which has since been implemented there.

Recommendations:

    a.   Include a mass POD plan annex in future pandemic planning efforts.

    b.   Train and exercise mass POD operations.

2.8.4. Strength: Vaccination standby list

Observation: To ensure all doses from a vial were used, MPHD developed a vaccine standby list for those willing to get COVID-19 vaccinations at the last minute.

Core Capability: Planning, Public Information and Warning

PHEP Capability: Medical Countermeasure Dispensing and Administration, Information Sharing

Analysis: Because of the increased demand for vaccines and to ensure that all doses were utilized, MPHD developed a standby list for those interested in receiving the COVID-19 vaccine on short notice. The public could email their contact information to an MPHD inbox, with the understanding that they could arrive at the vaccination POD 20 minutes before the site closed and receive a vaccination. Toward the end of the day, MPHD staff would contact the vaccine site to confirm the number of remaining doses. Once doses were confirmed to still be available, individuals on the standby list were contacted and informed to go to the site to receive their dose. This strategy also strengthened MPHD's social media presence within the community.

Recommendation:

    N/A.

2.9. Strike Team Operations

This section provides strengths and areas for improvement related to strike team operations activities during the COVID-19 pandemic.

2.9.1. Strength: Strike Team operations and management

Observation: MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration

Analysis: MPHD Strike Teams comprised temporary contract employees who were quickly onboarded to support testing operations. Their role eventually expanded to support vaccination efforts as well. Strike Team members were passionate about serving the communities they worked in every day and could earn trust with community leaders and members. Team members selflessly worked in extreme conditions like rain, snow, and blazing heat, and they rarely complained. Testing and vaccine sites were kept open later to accommodate working families or those who could not get to sites during more traditional hours. Despite the challenges associated with temporary staff, Strike Teams remained well-staffed throughout the pandemic and were flexible enough to meet the needs of community members. From January 4, 2021, to December 30, 2022, Strike Team members administered 39,905 vaccines.

Recommendations:

    a. Record Strike Team operating procedures in future pandemic planning.

    b. Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.

    c. Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

2.9.2. Area for Improvement: Additional translation services available at Strike Team events

Observation: Strike Teams did not always have access to translation services, which would have helped serve the communities in which they were deployed better.

Core Capability: Operational Coordination, Mass Care Services

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: Throughout the pandemic, Strike Teams provided education, testing, and vaccination support for the most underserved communities in Nashville, many who had little or no English. While access to translation services through the Language Line was an option, it was not efficient in face-to-face settings. Many Strike Team members relied on translation applications on personal cell phones or on communication with English-speaking family members. MPHD did add Spanish-speaking translators late in the team's response, but the early addition of a translator at Strike Team events would have been beneficial to building rapport and trust with the communities being served.

Recommendations:

    a. Increase recruiting efforts for bi-lingual staff members.

    b. Consider incentivizing existing bi-lingual staff members.

c. Commit to providing translators and translated materials at community testing and vaccine Strike Team events.

2.10. Technology

This section provides strengths and areas for improvement related to technology during the COVID-19 pandemic.

2.10.1. Strength: Metro ITS liaison integration with MPHD

Observation: Early in the response Metro ITS assigned a liaison to MPHD, which greatly helped with assessing MPHD's technical needs.

Core Capability: Operational Communications, Public Information and Warning

PHEP Capability: Emergency Public Information and Warning, Information Sharing

Analysis: Early in the response, MPHD partnered with Metro ITS, who offered a highly trained liaison who integrated into MPHD to assist with MPHD's technical needs. This partnership proved to be critical to the MPHD's early success with communication. The liaison worked with MPHD staff and the IT department to quickly develop technology solutions to key functions such as broadcasting to the public, including closed captions, video conferencing on a large scale, and rapidly establishing MPHD's Hotline. This also made it possible to set up accounts for new employees quickly and get them equipment on the day of hire.

Recommendations:

a. Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.

b. Develop operating guides for establishing broadcasting and video conferencing capabilities.

2.10.2. Area for Improvement: RedCap project as Vaccination Scheduler

Observation: RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD developed a RedCap project for COVID-19 vaccination appointments. However, the program was not designed for the volume of appointment requests received, and it had several issues in maintaining operations. Staff were required to constantly monitor the software and release only a designated number of appointments at a time to prevent the program from crashing. The limited availability of appointments caused frustration for patients, and it contributed to perceived delays in accessing vaccines. Although RedCap provided the intended service, it was not the most efficient way to schedule the volume of vaccination appointments that the response required.

Recommendations:

a. Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.

b. Coordinate with Metro ITS to explore in-house scheduling solutions that communicate with the MPHD Electronic Health Record System and HIPAA compliant.

2.10.3. Area for Improvement: Case investigations did not utilize RedCap earlier in the case monitoring process

Observation: RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method caused several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In the early stages of case monitoring and contact tracing, MPHD utilizing a Microsoft Excel spreadsheet stored on MPHD's SharePoint page to save monitoring and contact tracing notes. This method had benefits, such as ease of use, and it allowed for simultaneous users. However, SharePoint was slow to load at times, and on several occasions, staff accidently deleted data from the spreadsheet. This required reverting to an older version of the spreadsheet. Eventually, and at the height of the pandemic, the case investigation team developed a RedCap project to capture case and contact data more efficiently and eliminate the need to store data in less-reliable means. Using RedCap was a vast improvement in storing case notes, but it would have been far more beneficial earlier in the response.

Recommendation:

    a. Record the use of RedCap as the initial tool for storing data and build any necessary RedCap projects as early as possible.

2.11. Resources, Procurement, and Supply Chain Management

This section provides strengths and areas for improvement related to resources, procurement, and supply chain management activities during the COVID-19 pandemic.

2.11.1. Strength: MPHD Public Health Emergency Preparedness Logistics Operations

Observation: MPHD PHEP team expertly managed logistical operations throughout the pandemic.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness

Analysis: Through many years of planning and preparation, the MPHD PHEP logistics team could exceptionally support not only MPHD but also several healthcare facilities in Davidson County with the deployment of personal protective equipment (PPE) when other larger government agencies in the state were unable to do so. In addition, the logistics team expertly provided PPE and POD resources to MPHD testing and vaccination PODs for over two years. Standard operating procedures dictated that the PHEP logistics team ordered and stored PPE annually with end-of-year funding. This ongoing practice made PPE available throughout the pandemic. The available PPE included gowns, face shields, gloves, and most importantly, N95 masks. The pre-planning of the MPHD PHEP logistics team helped MPHD respond to the COVID-19 pandemic effectively and protect the lives of the staff and the public.

Recommendation:

    a. Monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to date list of supplies is kept in the PHEP warehouse inventory control program.

2.11.2. Strength: Mask distribution efforts

Observation: MPHD made every effort to provide masks throughout the pandemic response.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: By using drive-thru mask distribution PODs, passive distribution stations at facilities or event entrances and by teams walking through malls or along city streets, MPHD made every effort to provide masks to the residents and visitors of Nashville and Davidson County. MPHD consistently ordered, stored, and delivered masks to staff, facilities, and partners throughout the county. Teams of MPHD staff traveled to high traffic and public areas to hand-deliver masks in the evenings and over the weekend, and they educated the general public about the importance of wearing masks. Based on the Governor's orders, MPHD staff established a mask distribution POD and provided masks to those who formed a line outside of the building. MPHD remained committed to mask distribution efforts throughout the COVID-19 response and recovery efforts.

Recommendation:

N/A.

2.12. Order Enforcement

This section provides strengths and areas for improvement related to order enforcement activities during the COVID-19 pandemic.

2.12.1. Strength: Online Event Application Process

Observation: MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Using RedCap software, MPHD developed an online private event approval application that was flexible and easy to update as the Mayor's orders altered regulations. Through a series of questions related to the event, the software identified the number of attendees that could attend the gathering. After reviewing a questionnaire, an MPHD team member would have a detailed conversation with event planners to offer guidance or suggestions that could make events safer or potentially allow additional attendees. The seven largest convention hotels in the city followed a separate process in which MPHD teams coordinated with each establishment to make site visits and measure each convention room to establish a pre-planned, pre-determined maximum number of attendees. This was based on event criteria, such as alcohol consumption, seated vs. standing accommodation, and whether attendees were eating. The effort of the MPHD team to develop the event application process safely regulated events citywide and created public trust.

Recommendation:

a. Capture the online event application process in pandemic planning efforts.

2.12.2. Strength: MPHD Director's Health Order enforcement efforts

Observation: MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD's Environmental Health Department organized a small team of 16 restaurant inspectors who reviewed and responded to daily health order violations reported by the general public on an online reporting tool. Team members contacted business owners to notify them about the reported violation and provided expectations and consultation on how the violator could comply with the health order, as opposed to directly using punitive enforcement. The efforts of MPHD were exceptional, but it was quickly evident that MPHD was not equipped or trained to handle volatile situations that arose in order enforcement situations. Continuing to engage MNPD early in responses of this magnitude is key to ensuring proper and safe enforcement activities.

Recommendations:

    a. Engage response partners, including MNDP, in pandemic planning and Director's Health Order enforcement efforts.

    b. Provide education and guidance to MNPD during Director's Health Order enforcement operations.

2.13. COVID-19 Variants

This section provides strengths and areas for improvement related to COVID-19 variants during the COVID-19 pandemic.

2.13.1. Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community

Observation: With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.

Core Capability: Operational Coordination

PHEP Capability: Emergency Operations Coordination

Analysis: With each COVID-19 variant surge, MPHD quickly altered response activities as needed to best serve the community. MPHD leadership and public information personnel tracked emerging variants and released information to the public using press conferences and social media campaigns, emphasizing the importance of non-pharmaceutical interventions, vaccines, and vaccine boosters. Strike Teams held additional events within communities most affected, and a short notice vaccination POD at Lentz was established on New Year's Eve in 2021. MPHD continued to update and communicate direction on all available platforms in accordance with CDC and Tennessee Department of Health guidance.

Recommendation:

    a. Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.

2.14. Finance

This section provides strengths and areas for improvement related to finance activities during the COVID-19 pandemic.

2.14.1. Area for Improvement: Lack of standardized method to track spending

Observation: Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.

Core Capability: Economic Recovery

PHEP Capability: Community Recovery

Analysis: Stakeholders stated that, in the absence of standardized tracking methods for spending, individuals tracked information such as requisition numbers, purchase order numbers, line-item orders, costs, vendors, and the location where the item was deployed without being directed to do so. Throughout the response, there was not a standardized method of tracking items purchased, and not all items were tracked in the same way. The lack of an established method to track spending could create difficulties in cost recovery and requisition.

Recommendations:

a. Develop standardized purchasing and tracking processes and train staff on these procedures.

b. Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.

c. Incorporate purchasing and tracking of purchasing into RHOC operations during activation.

2.15. Recovery and Demobilization

This section provides strengths and areas for improvement related to recovery and demobilization activities during the COVID-19 pandemic.

2.15.1. Strength: Phased demobilization strategy

Observation: MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Due to lessons learned from conducting demobilization operations too quickly, MPHD developed a demobilization strategy that would slowly end operations using a phased approach. Vaccine and testing operations transitioned primarily to the Strike Teams, with vaccines also being offered in MPHD clinics. The PHEP team assessed supply levels and monitored the return of equipment from the PODs. Warehouse inventory management is an ongoing process that will continue to develop over time.

Recommendation:

a. Capture demobilization and recovery procedures in pandemic planning efforts.

2.15.2. Area for Improvement: Better public communication about Strike Team demobilization

Observation: Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.

Core Capability: Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning

Analysis: Strike Teams were critical to serving Nashville's most vulnerable populations, and many community members relied on the accessibility offered by their events. However, stakeholders noted that there was an overall lack of communication to communities who depended on the events when Strike Team operations were coming to an end. Strike Team members worked hard to build trust and rapport with the communities they were serving, and the lack of communication could affect a long-term effective relationship between MPHD and these communities.

Recommendation:

    a. Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.

3. Conclusion

The Nashville Metro Public Health Department continues to recover from the COVID-19 pandemic. Due to the magnitude of the response, it is likely recovery efforts will be ongoing for the foreseeable future. This AAR provides key findings that demonstrate strengths for codification as best practices and areas for improvement that can be addressed immediately, which will further improve recovery efforts and future responses. The recovery from COVID-19 cannot be solved by one single entity, and the responsibility is on all of MPHD to address these gaps.

MPHD's greatest strength is the dedication, innovation, and flexibility of its workforce. MPHD is committed to public health and has worked tirelessly to adapt quickly to the changing environment during the pandemic response. Staff worked to balance the needs of the pandemic with the daily and routine commitments in other essential public health services. MPHD has an effective and compassionate workforce that successfully led MPHD during the COVID-19 pandemic, with a sharp focus on health equity and the importance of protecting and reaching the most vulnerable individuals. A shining example of this is the efforts of the Strike Teams to build relationships with community leaders and members of the most underserved parts of the city and for MPHD to ensure the availability of assessment centers and vaccination sites throughout the city and county. Partnerships also developed and strengthened with traditional and non-traditional partners who were crucial to the overall success of MPHD's response. These should be fostered for future public health efforts.

MPHD stakeholders are encouraged to use the findings in this report to further refine recovery efforts related to the COVID-19 pandemic and the plans, procedures, and training needed to support future emergency response efforts. In addition, MPHD is encouraged to consider implementing the practice of completing interim AARs for future lengthy responses similar to the COVID-19 response. The findings of this AAR have been incorporated into the attached Improvement Plan, which will help guide efforts to build on the information identified and analyzed in this report.

Appendix A: Improvement Plan

This Improvement Plan (IP) was developed for the Nashville Metro Public Health Department (MPHD)as part of the after-action review process. Observations and recommendations in the IP were established as a collaborative planning effort with key stakeholders. Areas for Improvement with highlighted recommended actions and corresponding lead agency, agency point of contact, start date, and end date are listed in Table 2. Table 3 of the IP highlights MPHD's strengths with recommended actions for implementation.

Table 2: Improvement Plan – Areas for Improvement

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (a)	AFI: Commitment to utilizing the ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with the department's response approach and did not fully utilize the ICS.	Assign and properly train key primary and alternate Regional Health Operations Center (RHOC) positions.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (b)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Consider cross-training RHOC positions to ensure staff coverage.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (c)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (d)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Establish the role and responsibilities of the Executive Leadership Team (ELT) during response operations.	ELT	Director of Health, Deputy Directory of Health, CDEP Bureau Director, Medical Director	July 1, 2023	Ongoing
2.1.3 (a)	AFI: Enhanced screening of temporary staff candidates	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	Stakeholders noted that need for better screening of temporary staff during operations that required the need for surge staffing.	Develop protocols for screening and hiring temporary and contract employees.	MPHD HR	HR Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.2.2 (a)	AFI: MPHD leadership's communication to staff	Core Capability: Operational Communications, Situational Assessment PHEP Capability: Information Sharing	Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.	Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.	ELT	Director of Health, Deputy Director of Health, Medical Director, Communications Division	July 1, 2023	Ongoing
2.4.8 (a)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.	Establish an internal social work department to partner with case investigations during future large-scale operations.	ELT	Preventative Health Bureau Director, Behavioral Health Program Director	As needed	As needed
2.4.8 (b)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Identify and include community-based organizations that support underserved communities to assist with case management.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.8 (c)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Mature relationships developed during pandemic; include community partners in pandemic planning efforts.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing
2.4.9 (a)	AFI: Communication with the public regarding the TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.	Vaccine Preventable Disease (VPD)	VPD Program Director and Team	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.9 (b)	AFI: Communication with the public regarding the use of TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.	VPD and MPHD PIO	VPD Program Director and Team and MPHD PIO	July 1, 2023	June 30, 2029
2.5.3 (a)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Provide resources to recruit and retain additional bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (b)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.5.3 (c)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider procuring "as needed" contracts for translation services.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (d)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Ensure ample interpreters are available during community events, such as testing and vaccination PODs.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.6.5 (a)	AFI: Increase advertisement efforts for community events	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped to reach more members of vulnerable communities.	Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.	MPHD PIO, Strike Team, Health Equity	MPHD PIO, Strike Team Leader, Health Equity Bureau Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.6.6 (a)	AFI: Consistent promotion of wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Utilize city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029
2.6.6 (b)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.6.6 (c)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.9.2 (a)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Increase recruiting efforts for bi-lingual staff members.	Strike Team, Translation Services	Strike Team Leader, Translation Services Program Director	As needed	As needed
2.9.2 (b)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Consider incentivizing existing bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed
2.9.2 (c)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Commit to providing translators and translated materials at community testing and vaccine strike team events.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.2 (a)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.	Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.	MPHD ITS Bureau	MPHD ITS Bureau Director	July 1, 2023	June 30, 2029
2.10.2 (b)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues due to because of the system's limitations.	Coordinate with Metro ITS to explore in-house scheduling solutions that communicates with the MPHD Electronic Health Record System and are HIPAA compliant.	Metro ITS, MPHD ITS Bureau, MPHD Electronic Health Record	Metro ITS Program Director, MPHD ITS Bureau Director, Electronic Health Record Planning Team Lead	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.3 (a)	AFI: Case investigations did not utilize RedCap earlier in the case monitoring process	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method proved to cause several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.	Record the use of RedCap as the initial tool for storing data during case monitoring and contact tracing operations.	PHEP	PHEP Epidemiologist	July 1, 2023	June 30, 2029
2.14.1 (a)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Develop standardized purchasing and tracking processes and train staff on these procedures.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (b)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (c)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Incorporate purchasing and tracking of purchasing into RHOC operations during activation.	MPHD Finance Bureau, PHEP	Finance Bureau Director, PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.15.2 (a)	AFI: Better public communication about Strike Team demobilization	Core Capability: Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning	Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.	Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.	Strike Team, MPHD PIO	Strike Team Leader, MPHD PIO	As needed	As needed

Table 3: MPHD Strengths

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.1.1 (a)	Strength: Quick onboarding of temporary workers for surge staffing	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.	Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/counselors, strike team members.
2.2.1 (a)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Maintain and mature the relationships formed during MPHD's response.
2.2.1 (b)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.	Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.
2.2.1 (c)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Include special interest groups in future public health preparedness drills and exercises.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.1 (a)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.
2.3.1 (b)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercise events.
2.3.2 (a)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notification of positive cases.	Continue to maintain interfacing capabilities for future needs.
2.3.2 (b)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Capture interfacing/query capability in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.2 (c)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Incorporate database interfacing capability into future exercises and drills.
2.4.1 (a)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Record case investigation processes and procedures for future pandemic planning efforts.
2.4.1 (b)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Consider procuring standing contracts with companies on an "as needed" basis for future surge staffing needs.
2.4.2 (a)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.2 (b)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Maintain a list of viable community organizations that were helpful in providing wraparound services and use Wear to Turn in Nashville (WTTIN) as a resource.
2.4.3 (a)	Strength: Epidemiologist communication and coordination with COVID-19 case investigators	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.	Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.
2.4.4 (a)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Capture mass case investigation processes and procedures in future pandemic planning efforts.
2.4.4 (b)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.5 (a)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Consider including an investigator guide as an annex in future pandemic planning efforts.
2.4.5 (b)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Memorialize case investigation processes and best practices for future pandemic planning efforts.
2.4.6 (a)	Strength: Implementation of the TeleTask Texting System	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.	Consider maintaining a mass texting system for other MPHD public health efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.7 (a)	Strength: Development of the Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Train additional staff in the development of content for dashboards and related tools.
2.4.7 (b)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).
2.4.7 (c)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public facing dashboard to track several data points.	Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.5.1 (a)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Due to delays outside MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.
2.5.1 (b)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.
2.5.1 (c)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure ample interpreters are available during community events such as testing and vaccine PODs.
2.5.1 (d)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure new and temporary employees are properly trained on Language Line operations.
2.5.1 (e)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.
2.5.2 (a)	Strength: The MPHD COVID-19 Hotline	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.	Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.1 (a)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city's and county's underserved and diverse communities.
2.6.1 (b)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.
2.6.2 (a)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.
2.6.2 (b)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.
2.6.3 (a)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Develop more robust mutual aid agreements with the Sherriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.3 (b)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Include response partners in future pandemic planning to ensure that fully developed response plans are created.
2.6.4 (a)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.
2.6.4 (b)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	Maintain contracts with transport vendors for future public health events.
2.7.1 (a)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.
2.7.1 (b)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Consider holding assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.7.1 (c)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.
2.7.2 (a)	Strength: Strike Team testing support	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.	Increase efforts to advertise Strike Team testing event locations to reach a larger audience.
2.8.1 (a)	Strength: Multi-agency vaccination efforts	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Medical Countermeasure Dispensing and Administration	Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.	Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.
2.8.2 (a)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.2 (b)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.
2.8.2 (c)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.
2.8.3 (a)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Include a mass POD plan annex in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.3 (b)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Train and exercise mass POD operations.
2.9.1 (a)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Record Strike Team operating procedures in future pandemic planning.
2.9.1 (b)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.
2.9.1 (c)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.10.1 (a)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.
2.10.1 (b)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop operating guides for the establishment of broadcasting and video conferencing capabilities.
2.11.1 (a)	Strength: MPHD Public Health Emergency Preparedness Logistics Operations	Core Capability: Supply Chain Integrity and Security, Planning PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness	The MPHD Public Health Emergency Preparedness (PHEP) team expertly managed logistical operations throughout the pandemic.	To help monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to-date list of supplies is kept in the PHEP warehouse inventory control program.
2.12.1 (a)	Strength: Online Event Application Process	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.	Capture the online event application process in pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.12.2 (a)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Engage response partners, including MNPD, in pandemic planning and Director's Health Order enforcement efforts.
2.12.2 (b)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Provide education and guidance to MNPD during Director's Health Order enforcement operations.
2.13.1 (a)	Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community	Core Capability: Operational Coordination PHEP Capability: Emergency Operations Coordination	With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.	Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.
2.15.1 (a)	Strength: Phased demobilization strategy	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.	Capture demobilization and recovery procedures in pandemic planning efforts.

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Appendix B: After-Action Review Methods

The AAR/IP involved a multi-step process, moving from data collection through establishing the IP. The following overview notes the implementation of the approach.

Step 1: Data Collection

The AAR data collection process used a combination of online surveys, a review of departmental self-assessment documentation, teleconferences, one-on-one outreach, and meeting notes.

Survey Design

MPHD issued a voluntary survey to internal and external response stakeholders that supported MPHD's response to the COVID-19 pandemic. The following survey was issued to response partners on January 31, 2023, using an online survey tool. The survey remained open for 24 days, and 140 survey responses were recorded.

Survey Outline

The purpose of the survey was to gather data related to MPHD's COVID-19 preparedness, response, and recovery efforts. The information from this survey, coupled with interviews and a documentation review, informed this AAR for MPHD.

The questions related to the COVID-19 pandemic are as follows:

Section 1: Survey Respondent Information

- **Data Requested**
  - Name
  - Email
  - Title
  - Jurisdiction, Department, Agency, Organization, or Company Name
  - Please list your incident-specific position or role. If unknown, please describe the incident response or recovery actions you supported.

Section 2: Evaluation of Activities Specific to COVID-19

- **Case Investigation Operations**
  - Rate the ability of the MPHD to effectively investigate COVID-19 cases and provide support to quarantined and isolated individuals with available staffing. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to MPHD's overall Case Investigation operations and staffing concerns. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to MPHD's overall case investigation operations and staffing concerns. (open ended comment box)

- **Contact Tracing Program**

  - Rate the effectiveness of MPHD's COVID-19 contact tracing program and ability to identify barriers and challenges associated with contact tracing. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's overall management of an effective COVID-19 contact tracing program. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's overall management of an effective COVID-19 contact tracing program.

  - Rate MPHD's contact tracing program in the following area: supported the identification of health inequities or disparities (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's contact tracing program in the following area: supported connection to wraparound services (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's contact tracing program in the following area: how contact tracing data informed decisions regarding testing and vaccination efforts. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

- **Isolation and Quarantine**

  - Rate the effectiveness of MPHD's ability to provide education surrounding isolation and quarantine and identify barriers and challenges to isolation and quarantine. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

- **TeleTask Texting System**

  - Rate the implementation, management, and maintenance of the TeleTask Texting System. (open ended comment box)

    - Describe any strengths or best practices you observed related to the TeleTask Texting System (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to the TeleTask Texting System (open ended comment box)

- **Data Reporting**

  - Rate MPHD's management of data reporting through the data dashboard. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to MPHD's management of data reporting. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to MPHD's management of data reporting. (open ended comment box)

- **NBS**

  - Rate the implementation, management, and maintenance of the National Electronic Disease Surveillance System (NEDSS) Base System (NBS) (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the NBS. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to the NBS. (open ended comment box)

- **RedCap**

  - Rate the implementation, management, and maintenance of the RedCap project. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the RedCap project. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to the RedCap project. (open ended comment box)

- **Translation Services**

  - Rate MPHD's overall support for verbal Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's overall support for written Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)

- **Language Line**

  - Rate the implementation of the Language Line. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the Language Line. (open ended comment box)

    - ◆ Describe any areas for improvement and challenges you observed related to the Language Line. (open ended comment box)

- **Non-English Printed Materials**

  - Rate the quality and process for obtaining printed materials utilized for case interviews and COVID-19 information packets printed in Spanish, Arabic, and additional languages as well as printed materials obtained from special vendors. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any best practices you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

- **Social Services and Human Needs**

  - Rate MPHD's referral to food access programs (to include the grocery delivery program) (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to housing programs. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to transportation services. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to health care and insurance programs. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to mental health services. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to economic support services. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to social services and human needs. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to social services and human needs. (open ended comment box)

- **Thermometer Delivery Program**

  - Rate MPHD's overall implementation of the thermometer delivery program. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

- **Support to Vulnerable and Diverse Populations**

  - Rate MPHD's overall support and services provided to vulnerable and diverse populations during COVID-19 response and recovery. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

  - Rate MPHD's overall support to incarcerated individuals during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ▪ Rate MPHD's overall support for and services provided to the transient and homeless population during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

- ▪ Rate MPHD's overall support for and services provided to those in long term care facilities during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any strengths or best practices you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

- ▪ Rate MPHD's outreach effort with Siloam and TN Immigrant and Refugee Rights Coalition (TIRRC). (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

- • **Metro Nashville Public Schools**

  - ▪ Rate MPHD's overall support to the Metro Nashville Public Schools (MNPS) in response to and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the support provided to MNPS. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to the support provided to MNPS. (open ended comment box)

- **Hotline/Call Centers**

  - Rate the implementation and overall operations of MPHD's COVID-19 Hotline. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to Hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

- **Testing**

  - Rate MPHD's implementation and maintenance of an effective COVID-19 testing program, including establishment of testing sites that serve under-resourced populations, such as those with limited transportation options, disabilities, or those living in remote or low-income areas. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

- **Assessment Centers – Kmart, Nissan, Meharry**

    - Describe any strengths or best practices you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

- **Testing – Strike Team**

  - Rate the overall effectiveness of the MPHD's Strike Team Testing (STT) operations. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- Describe any areas for improvement or challenges you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- **Order Enforcement**

  - Rate the MPHD's overall implementation and maintenance of Order Enforcement during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any areas for improvement or challenges you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any strengths or best practices you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any MPHD strengths or best practices you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe any MPHD areas for improvement or challenges you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe how well you feel MPHD complied with enforcing and implementing orders throughout the pandemic response. (open ended comment box)

- **Supply Chain/PPE**

  - Rate MPHD's ability to support the supply chain, including working with the private sector, and communicating any resource issues and challenges, including providing PPE to healthcare workers. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's management of medical equipment and PPE expiration date monitoring. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

- **Strategic National Stockpile**

    - Describe any strengths or best practices you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

- **Mask Distribution**

  - Rate MPHD's overall implementation and management of mask distribution during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's management of the initial mask distribution to health departments. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

  - Rate MPHD's support to sustained mask distribution efforts at community centers. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD sustained mask distribution efforts at community centers. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's sustained mask distribution efforts at community centers. (open ended comment box)

- **IT and Data Systems**

  - Rate MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    - ◆ Describe any strengths or best practices you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any strengths or best practices you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any strengths or best practices you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvements or challenges you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ▪ Rate MPHD's use of Redcap as the agency's COVID vaccine appointment system. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

- **Vaccination**

  - ▪ Rate MPHD's vaccination program efficacy in the following area: accessibility of vaccine sites. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: reaching the homebound. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: providing targeted, culturally and linguistically responsive public information. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: combating misinformation and vaccine hesitancy. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

- **Vaccination – CORE POD: COVID On-Site Response at East**

  - ▪ Rate MPHD's COVID Onsite Response at East (CORE) vaccination POD (initial vaccine site operated for approximately two months). (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's CORE vaccination POD. (open ended comment box)

    - ◆ Describe any challenges you observed related to MPHD's CORE vaccination POD. (open ended comment box)

- **Vaccination – Strike Teams**

  - ▪ Rate the effectiveness of MPHD's Strike Teams during vaccination operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- **Vaccination – 75+ POD**

  - ▪ Rate MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

- **Vaccination – Music City Center**

  - ▪ Rate MPHD's support to Music City Center vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

- **Vaccination – Nissan POD**

  - ▪ Rate MPHD's support to the Nissan vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

- **COVID-19 Variants**

  - ▪ Rate MPHD's ability to manage and adapt to new COVID-19 variants such as Delta and Omicron. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's ability to adapt to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's ability to adapted to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe how future challenges could be mitigated regarding new COVID-19 variants. (open ended comment box)

- **Charlotte Ave Assessment Center – August 2021 Case Surge**

  - ▪ Rate MPHD's implementation and management of the Charlotte Assessment Center during the August 2021 Case Surge. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- **Strike Team Operations**

  - ■ Rate the overall operations including deployment, operations, staffing, equipping, and stand-down of MPHD's Strike Teams during the COVID-19 response. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

  - ■ Rate MPHD's Strike Teams' support to vulnerable populations (e.g. homebound, DIDD, LTC, individuals experiencing homelessness, incarcerated individuals, immigrant and refugee population, people of color). (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

- **Health Equity**

  - ■ Rate MPHD's ability to promote health equity during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

    - ◆ Describe any areas for improvement you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

- **Finance**

  - ■ Rate MPHD's tracking of spending and awareness of all available funding mechanisms to support effective disaster cost recovery. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's cost recovery program. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's cost recovery program. (open ended comment box)

- **Recovery and Demobilization**

  - ■ Rate MPHD's recovery and demobilization operations. (did not observe, poor, below average, average, above average, excellent)

- Describe any strengths or best practices you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- Describe any areas for improvements or challenges you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

Section 3: Notable Event During the Pandemic Response

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operation during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

- Rate MPHD's overall response performance related to the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

  - Describe any strengths or best practices you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - Describe any areas for improvement or challenges you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts. (open ended comment box)

  - List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts. (open ended comment box)

  - Additional comments. (open ended comment box)

Step 2: Interviews

Based on a list provided by MPHD Public Health Emergency Preparedness (PHEP), critical response staff were given an opportunity to participate in an interview to discuss the overall response, strengths, and areas of improvement. Of the 31 individuals invited to attend, 20 participated in interviews.

Table 4: Participants in Interviews

Interview Representation	#
MPHD	15
Metro Government	4
Response Partners	1
Total	**20**

The interview questions related to the COVID-19 pandemic were as follows:

- Name:

- Agency:

- In what role(s) did you serve during the COVID-19 Pandemic response?

- Thinking about the entire span of the response (March 2020–December 2022). What processes/systems/tools/plans did your agency implement that you believe improved the response? (e.g., trainings, processes, EOPs, SNS plans, etc.)

- Thinking back to March 2020, what do you wish you knew then that you know now that might cause you to take a different course of action?

- Based on your role and observations, what are three things you believe MPHD did well during the response to COVID-19?

- Based on your role and observations, what are three things you believe MPHD needs to improve for future large-scale responses like COVID-19?

- How would you describe MPHD's ability to provide clear communication and guidance to staff? What could have been improved with the communication provided?

- Describe your experience with the Case Management Leadership Team.

- Describe your role and experiences with the Isolation & Quarantine team. Do you feel that isolation and quarantine guidance was managed effectively?

- Describe your role and experiences with the testing and vaccination processes. Do you feel MPHD managed testing and vaccination programs effectively? Can you highlight any strengths or areas for improvement in this area?

- Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts.

- List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts.

- Additional Comments:

Step 3: Data Analysis

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Survey Response Summary

- The Nashville Metro Public Health Department COVID-19 AAR survey received 140 responses.

Table 5: Overview of Survey Respondents

Representation	#
MPHD Partners	124
Metro Government Partners	3
Community Response Partners	13
Total	140

Survey outputs and interview notes were analyzed and sorted by topic area and similar comments and outputs were consolidated.

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Step 4: Establishing the Improvement Plan

Key observations and associated recommended actions were presented in the AAR and the appended IP. In addition, the IP prioritizes areas for improvement, indicates the agency or organization assigned to lead response to each identified sustainment opportunity and area for improvement, and establishes a timeline for completing associated actions (i.e., start and completion dates). MPHD Public Health Emergency Preparedness (PHEP) will meet with key stakeholders internally to review the IP and assign responsibilities and timelines for implementation.

Step 5: Implementing the Improvement Plan

The IP remains a living tool to help guide the process of addressing areas for improvement and will be used at follow-up meetings to check the status of outstanding areas for improvement and corresponding activities. MPHD PHEP will continue to guide the improvement process, but responsible agencies and organizations will lead the responses to their assigned areas for improvement. MPHD PHEP will establish an accountability process, including meetings as needed to assess progress with appropriate stakeholders.

Appendix C: Partner Agencies

Traditional and non-traditional partnerships formed and strengthened were critical to the success of response and recovery efforts. MPHD partnered with the agencies in Table 6 thorough the response to and recovery from COVID-19.

Table 6: Partner Agencies

Aegis Lab	Music City Center
AEL Lab	Music City Tents
Ascension Health Systems	Nashville Convention and Visitors Corp
Axios	Nashville Fairgrounds
Belmont University School of Nursing	Nashville Fire Department
Belmont University School of Pharmacy	Nashville Predators
Boswell's Golf Carts	Nashville Red Cross
Bridges for Deaf and Hard of Hearing	Nashville Rescue Mission
Bridgestone Arena	National Pan-Hellenic Council of Nashville
Conexion and Casa Azafran	Neighborhood of Health
Congregational Health & Education Network	Office of Emergency Management
Davidson County Sheriff's Office	PathGroup Lab
DVL Seigenthaler	Plaza Mariachi
El Jefe 96.7	Randstad
English Learners Office/Metro Public Schools	Room in the Inn
Exit In	Salvation Army
FEMA Region IV	Siloam
FiftyForward	St. Thomas EMS
Greater St. James Missionary Baptist Church, 28th Avenue	Tennessean
Hands On Nashville	TN Department of Intellectual Developmental Disabilities
HCA	TN Department of Health
hubNashville	TN Emergency Management Agency
Islamic Center of TN	TN Hospital Association
Lee Chapel African Methodist Episcopal Church	TN Immigrant and Refugee Rights Coalition
Maxim	TN Lookout
Mayor's Office	TN National Guard
Metropolitan Development & Housing Agency	TN Titans
Meharry Medical College	The Contributor
Metro Beer Board	Trako Dental & Medical Supply
Metro Finance	United Rentals
Metro General Hospital	US Marshall's Office
Metro General Services	US Forestry Service
Metro ITS	Vanderbilt University Medical Center
Metro Legal	Vanderbilt University School of Nursing
Metro Nashville Airport Authority	WeGo
Metro Nashville Community Centers	Wellpath
Metro Nashville Network	WFSK Radio
Metro Nashville Public Schools	WKRN
Metro Parks	WPLN
Metro Police Dept	WSMV
Metro Public Works	WTVF
Metro Schools Fleet	WZTV
Metro Social Services	

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Appendix D: Incident Timeline

2020 Timeline

- **January 9:** The World Health Organization (WHO) traces Wuhan pneumonia illness to a new coronavirus.[i]

- **January 16:** Tennessee State Health Operations Center is activated due to the rise of COVID-19.[ii]

- **January 17:** The Centers for Disease Control (CDC) and Department of Homeland Security's Customs and Border Protection (CBP) announce public health screenings to be set up at three U.S. airports.[iii]

- **January 30**: The WHO declares the novel coronavirus disease (now designated as COVID-19) a public health emergency of international concern. [iv]

- **January 31**: The Secretary of the U.S. Department of Health and Human Services (DHHS) declares a public health emergency in response to COVID-19.[v]

- **February 11:** The WHO officially announces a name for this new disease as "COVID-19".[vi]

- **February 26:** The CDC confirms possible instance of community spread of COVID-19 in the U.S.[vii]

- **February 27:** MPHD established ICS and activated the RHOC.[viii]

- **February 27:** MPHD has established Incident Command to coordinate response planning for COVID-19 cases in Davidson County.[ix]

- **March 3:** A deadly tornado outbreak affected middle Tennessee on the night of March 2 and continued through the morning of March 3, 2020. A massive EF3 tornado hit and impacted Nashville, leaving 25 people dead. It was the 6th costliest tornado in United States history.

- **March 11**: The WHO declares COVID-19 a pandemic.[x]

- **March 12:** Governor Bill Lee declared state of emergence for Tennessee.

- **March 13**: U.S. President Donald J. Trump declares a national emergency in response to the COVID-19 outbreak.[xi]

- **March 13:** Gov. Bill Lee issues guidance for mass gatherings, schools, state employees, and the State Capitol Building.[xii]

- **March 15:** States in the U.S. begin to announce shutdowns to reduce the spread of COVID-19. Notable examples include New York's public-school system and Ohio's restaurants and bars.[xiii]

- **March 15:** The Metropolitan Board of Health of Nashville and Davidson County declares a public health emergency.[xiv]

- **March 16:** Mayor John Cooper announces the closure of bars and restaurants in Davidson county to slow the spread of COVID-19.[xv]

- **March 17:** The first human trial for a vaccine against COVID-19 begins in the U.S.[xvi]

- **March 17:** Gov. Lee urges all Tennessee school districts to close by March 20 and remain closed until March 31.

- **March 18:** Mayor John Cooper issued state of emergency for Metropolitan Nashville and Davidson County.

- **March 20:** MPHD sets up a COVID-19 Information Hotline.[xvii]

- **March 22:** Gov. Bill Lee signs executive order that mandates alterative business models for restaurants and gyms and visiting limitations for nursing homes, retirement homes, and long-term care facilities.[xviii]

- **March 23:** Gov. Bill Lee establishes a Unified-Command Group for COVID-19 to streamline coordination between TEMA, TDH, and TDM.[xix]

- **March 27**: President Trump and Congress approve a $2.2 trillion Coronavirus Aid, Relief, and Economic Security Act (CARES) aid package to assist individuals and companies with COVID-19 impacts.[xx]

- **March 30:** Safer at Home executive order is issued and will remain in effect until April 14.[xxi]

- **March 30:** Nissan and Meharry Assessment center opens.**[xxii]**

- **April 1:** The Kmart assessment center opens.**[xxiii]**

- **April 2:** The WHO reports evidence of transmission from symptomatic and asymptomatic people infected with COVID-19.[xxiv]

- **April 2:** Gov. Bill Lee issues Executive Order 23 requiring the people of Tennessee to stay at home except for essential activities.[xxv]

- **April 3:** The CDC issues guidance that recommends people wear a mask outside of their home.[xxvi]

- **April 20:** Gov. Bill Lee announces that Tennessee's stay at home order will end on April 30 and that businesses may reopen on May 1.[xxvii]

- **April 20:** Shelters open at the fairgrounds and is being staffed by Metro Social Services and St. Thomas EMS.

- **April 30:** President Trump launches Operation Warp Speed, an initiative to produce a vaccine for the coronavirus as quick as possible with CDC as an integral member.[xxviii]

- **May 4:** Case monitoring and isolation guidance is changing per CDC and TDH guidance. Cases will need to be monitored for a minimum of 10 days and must be symptom free for three consecutive days without the help of medication.[xxix]

- **May 7:** Metro Public Health clinics will begin screening patients' temps as they enter the clinics.

- **May 9:** The U.S. unemployment reaches 14.7%, the highest since the great depression.[xxx]

- **May 21:** MPHD Long-term care mass testing has been given to the regions and metros. Testing has been scheduled. There are approx. 51-52 sites that will undergo testing by MPHD staff.[xxxi]

- **May 25:** Phase 2 of the city reopening commences.[xxxii]

- **May 28:** TDH selects Davidson County's alternate care site at the General Hospital following a passed inspection.[xxxiii]

- **June 28:** The Metro Board of Health passed a motion requiring face masks to be worn in public.[xxxiv]

- **July 7:** The National Guard will be helping with testing at the assessment centers for the month of July.

- **August 4:** MPHD has ceased the drive-thru mask distribution at Lentz and has partnered with Metro Parks community centers to set up 11 mask distribution sites across Nashville. [xxxv]

- **September 16:** The Trump Administration releases a vaccine distribution plan to make the vaccine available and free for all Americans by January 2021.[xxxvi]

- **December 2:** Quarantine can end after Day 14 without testing and if no symptoms appear. This is what MPHD, TDH, and CDC recommend, and it is the option with the least risk of disease transmission. [xxxvii]

- **December 8:** The first allocation of COVID vaccines will go directly to hospitals for Tier 1a1 individuals. Preparations for distribution commence at an East Nashville site.[xxxviii]

- **December 11:** The Food and Drug Administration (FDA) issues an Emergency Use Authorization (EUA) for the Pfizer-BioNTech COVID-19 vaccine.[xxxix]

- **December 18:** The FDA issues an EUA for the Moderna COVID-19 vaccine.[xl]

- **December 23:** MPHD opens first vaccine clinic at the CORE site. [xli]

- **December 25:** A recreational vehicle detonated in downtown Nashville, Tennessee, United States, killing the bomber, injuring eight people and damaging several of buildings in the area.[xlii]

- **December 31:** The WHO issues its first emergency use validation for a COVID-19 vaccine and emphasizes need for equitable global access.[xliii]

2021 Timeline

- **January 4:** The Strike Team begins vaccine operations.[xliv]

- **January 5:** The Federal Emergency Management Agency (FEMA) modifies Allocation Order on exports such as personal protective equipment, scare health resources, and medical resources to ensure that these resources are widely available to the American public.[xlv]

- **January 5:** MPHD sets up 2 vaccination sites for tier 1 groups. The sites are the HCA building and the CORE site.[xlvi]

- **January 7:** The CDC releases the Comprehensive COVID-19 Quarantine vs Isolation guide that provides a detailed understanding for the procedures of isolation and quarantine for vaccinated and unvaccinated.[xlvii]

- **January 9:** MPHD operates a vaccination clinic for people ages 75 and older at the Lentz Centennial Rooms. [xlviii]

- **January 16:** Recover clinic opens.[xlix]

- **January 29:** The CDC issues an order requiring the wearing of masks by people on public transportation conveyances or on the premises of transportation hubs to prevent spread of the virus that causes COVID-19.[l]

- **January 30:** CORE site closes and the Music City Center opens.[li]

- **February 1:** The DHS releases a statement supporting equal access to COVID-19 vaccines and vaccine distribution sites.[lii]

- **February 2:** The CDC issues an order requiring that masks be worn on planes, buses, trains, and other forms of public transportation traveling into, within, or out of the United States and in U.S. transportation hubs, such as airports and bus stations.[liii]

- **February 18:** MPHD partners with the Nashville Rescue Mission to host the first homeless shelter vaccine event[liv]

- **February 26:** FEMA announces federal support to community vaccination clinics nationwide, putting $3.97 billion to vaccination efforts.[lv]

- **March 3:** MPHD partners with WeGo. WeGo can provide transportation of patients to and from vaccination sites.[lvi]

- **March 9:** FEMA establishes the Civil Rights Advisory Group to review policies, plans, practices, and strategies to ensure that vaccine access can be widely accessible to all. [lvii]

- **March 20:** "MPHD opens a one-day drive thru pod to vaccinate people from 6:00 AM to 8:00 PM.

- **April 20:** All person's age 16+ may now receive vaccinations. 37.8% of Davidson County residents have a first does and 23% are fully vaccinated. MPHD strike team begins to allow more walk-ins at events and moving away from registration.[lviii]

- **May 4:** MPHD starts an initiative to attend public events with popup vaccination sites to make the vaccine more accessible.[lix]

- **May 13:** The CDC announces that people who are fully vaccinated against Covid-19 no longer need to wear masks or physically distance—whether indoors or outdoors in most circumstances.[lx]

- **May 18:** MPHD sets up the Homebound Vaccination team.[lxi]

- **May 28:** Music City Center closes.[lxii]

- **June 25:** Recover closes.[lxiii]

- **July 16:** Nissan center closes.[lxiv]

- **September 7:** HCA assessment center opens.[lxv]

- **November 2:** The CDC releases recommendations for COVID-19 vaccines for children 5 to 11 Years.[lxvi]

- **November 19:** The CDC expands eligibility for COVID-19 booster shots to all adults.[lxvii]

- **November 19**: The COVID-19 emergency declaration ended in Tennessee on November 19, 2021, when Governor Bill Lee announced that he will not renew the COVID-19 state of emergency.[lxviii]

- **November 26:** The WHO announces the classification of Omicron (B.1.1.529) as a variant of concern.[lxix]

- **December 1:** The CDC announces that the first confirmed case of the Omicron variant was detected in the U.S.[lxx]

- **December 2:** The CDC announces new testing requirements for international travel to the U.S. to include a negative test 24 hours prior to departure.[lxxi]

- **December 6:** The CDC updates the international travel order to require air passengers from a foreign country show a negative COVID-19 viral test result taken no more than 1 day before travel, or documentation of having recovered from COVID-19 in the past 90 days, before they board their flight.[lxxii]

- **December 22:** The FDA issues an EUA for Pfizer's Paxlovid for the treatment of mild-to-moderate COVID-19 in adults and pediatric patients, 12 years of age and older. [lxxiii]

- **December 27:** The CDC announces revised isolation and quarantine requirements for the general public.[lxxiv]

2. Analysis

This section reviews the major strengths and areas for improvement identified in the AAR process. Each observation is presented as a strength or an area for improvement, identifies associated core capabilities, is based on observations documented through the data-collection process, and, if appropriate, presents recommendations that are specific and actionable. The observations are presented in 15 sections, as shown in Figure 1.
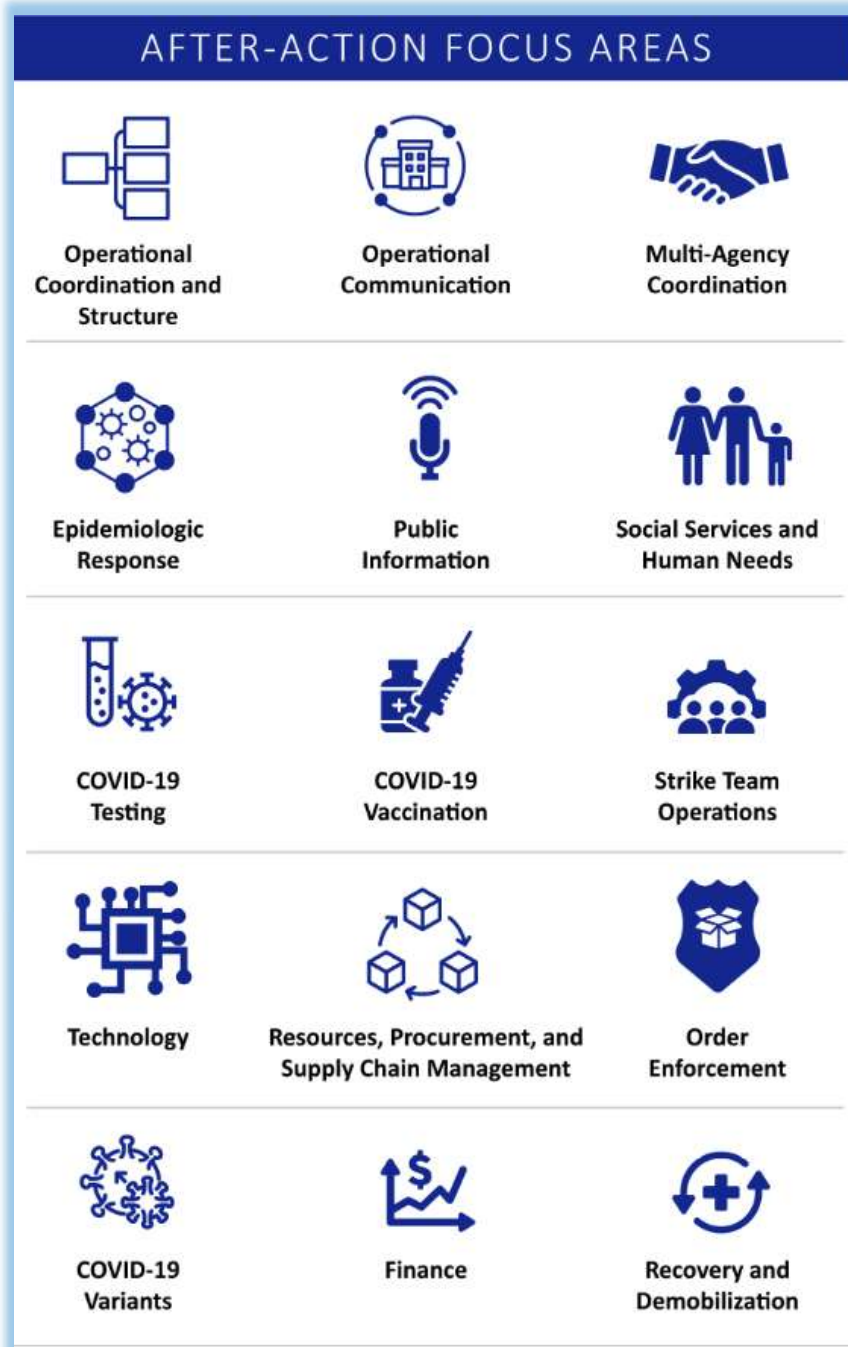

Figure 1: After-Action Focus Areas

2.1. Coordination and Structure

This section provides strengths and areas for improvement related to operational coordination and structure activities during the COVID-19 pandemic.

2.1.1. Strength: Quick onboarding of temporary workers for surge staffing

Observation: MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: Staffing throughout the pandemic was a concern, but MPHD management and RHOC staff coordinated extremely well with recruiters, staffing agencies, and HR staff to quickly on-board temporary staff members to fill positions in roles throughout MPHD. During peak hiring, HR onboarded up to 15 temporary staff members daily. To streamline the onboarding process, during the new hire background check wait times, HR worked to complete the necessary paperwork and information technology (IT) requirements with new staff prior to the start dates. Temporary staff were utilized to quickly provide additional support to the case investigations team and to provide staffing to develop the strike teams. Both operations were crucial to MPHD's ability to serve the most vulnerable populations of the city and county.

Recommendation:

a. Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/ counselors, strike team members.

2.1.2. Area for Improvement: Commitment to utilizing the Incident Command System (ICS) during response operations

Observation: Stakeholders noted that throughout the response, MPHD leadership was not consistent with MPHD's response approach and did not fully utilize the ICS.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination, Community Preparedness

Analysis: While MPHD utilized some components of the ICS during its response to COVID-19, many stakeholders noted that throughout the response, MPHD leadership was not consistent with their approach and did not fully embrace the ICS. This led to reinventing processes that were already established and created an overall lack of direction. In addition, several stakeholders noted that the lack of a cohesive response structure contributed to internal communication breakdowns and greatly influenced the sharing of information both internally and with the public, which further contributed to public mistrust. Affirming a commitment to utilizing the ICS will give MPHD a standardized incident management structure that can be tailored to match the complexities of any incident and give stakeholders clear response leadership and guidance.

Recommendations:

a. Assign and properly train key primary and alternate RHOC positions.

b. Consider cross-training RHOC positions to ensure staff coverage.

   c.   Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.

   d.   Establish the roles and responsibilities of the Executive Leadership Team (ELT) during response operations.

2.1.3. Area for Improvement: Enhanced screening of temporary staff candidates

Observation: Stakeholders noted the need for better screening of temporary staff during operations that required surge staffing.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Medical Surge

Analysis: The use of temporary staff was crucial to the success of MPHD's response and recovery to COVID-19. MPHD's management and RHOC staff, along with recruiters, staffing agencies, and HR professionals, worked tirelessly to fill roles in the most critical mission sets as efficiently and effectively as possible. Challenges were expected with the employment of so many temporary staff. Although the process to onboard staff was accelerated because of the situation was mostly positive, it was noted that in the future, care should be taken to better screen candidates.

Recommendation:

   a.   Develop protocols for screening and hiring temporary and contract employees.

2.2. Operational Communication

This section provides strengths and areas for improvement related to operational communication activities during the COVID-19 pandemic.

2.2.1. Strength: Communication with external partners

Observation: MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.

Core Capability: Operational Communications, Planning

PHEP Capability: Community Preparedness, Emergency Operations Coordination

Analysis: Almost immediately, MPHD held conference calls with Metro department leads and area hospitals to coordinate response actions. In addition, special interest groups, including religious leaders, childcare providers, Metro Nashville Public Schools (MNPS), the visitor's bureau, and the airport were contacted quickly. These reoccurring calls provided the opportunity for partners to establish clear lines of communication, set expectations for the response, identify community needs, and provide accurate information for partners to share with their networks.

Recommendations:

   a.   Maintain and mature the relationships formed during MPHD's response.

   b.   Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.

   c.   Include special interest groups in future public health preparedness drills and exercises.

2.2.2. Area for Improvement: MPHD leadership's communication to staff

Observation: Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.

Core Capability: Operational Communications, Situational Assessment

PHEP Capability: Information Sharing

Analysis: Many staff noted the lack of communication and transparency from MPHD leadership, particularly in the early stages of the response. Much of the information flow was received via second or third parties or rumors. This lack of communication led to frustration throughout MPHD. Some staff indicated that information was received via press conferences or news outlets instead of via internal leadership chains. As changes in leadership occurred, improvements in communication were noted. However, internal communication was not a perceived priority for MPHD leadership throughout the response.

Recommendation:

a. Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.

2.3. Multi-Agency Coordination

This section provides strengths and areas for improvement related to multi-agency coordination activities during the COVID-19 pandemic.

2.3.1. Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office

Observation: Frequent coordination and communication between MPHD, the Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD, OEM, and the Mayor's Office coordinated weekly or as needed to develop operational consistency. This helped to focus MPHD's efforts and enabled a more effective response for all agencies. Prior to the pandemic, communication between the agencies rarely occurred. MPHD, OEM, and the Mayor's Office have now formed a strong partnership and continue to develop that relationship post-response.

Recommendations:

a. Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.

b. Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercises.

2.3.2. Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project

Observation: MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD provided DEC with a daily count of positive COVID-19 cases in the Metro Nashville jurisdiction, including each case's home address. Initially, the data were manually entered into DEC's dispatch system. However, with the volume of daily cases, DEC technicians quickly became overwhelmed and struggled to keep up with data entry. Manual entry lasted approximately 2–4 weeks until it was possible to link MPHD's and DEC's databases. This eliminated the need to manually enter data, and it provided real-time information to DEC. DEC coordinated with Motorola to build a simple query that would notify the emergency dispatcher when a positive COVID-19 case was reported at the address where first responders were being dispatched. Dispatch codes were used to ensure patient privacy and remain in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA). This simple tool ensured that first responders remained safe and were taking proper safety precautions when responding to emergency calls. The interface between the databases was deactivated on April 12, 2021, but it can be reactivated if needed.

Recommendations:

a. Continue to maintain interfacing capabilities for future needs.

b. Capture interfacing/query capability in future pandemic planning efforts.

c. Incorporate database interfacing capability into future exercises and drills.

2.4. Epidemiologic Response

This section provides strengths and areas for improvement related to epidemiologic response activities during the COVID-19 pandemic.

2.4.1. Strength: COVID-19 case investigation operations

Observation: The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In March 2020, four epidemiologists from MPHD began case investigations and quickly expanded the team by using both internal Metro employees and temporary staff to assist with hundreds of daily COVID-19 cases. The case investigations team eventually grew to over 40 investigators who interviewed cases following epidemiological protocols and connected cases with community resources to assist them with their needs while in isolation. The MPHD case investigations team handled a massive number of COVID-19 cases and managed an enormous amount of data. Their data allowed MPHD to review case clusters throughout the city in a timely manner and provide updates to MPHD and city leadership as required. Throughout the response, the case investigations team continuously improved processes even as the required databases and protocols frequently changed. Nashville and Davidson County experienced one of the highest COVID-19 case counts in Tennessee, and the dedication and leadership of the case investigation team made this operation one of the most successful in MPHD.

Recommendations:

    a. Record case investigation processes and procedures in future pandemic planning efforts.

    b. Consider procuring standing contracts with companies on an "as-needed" basis for future surge staffing needs.

2.4.2. Strength: Wraparound services provided during COVID-19 case investigations

Observation: As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the course of case investigations, the team offered to connect patients with community resources while in isolation. Resources such as thermometer delivery, meal delivery through partnership with Second Harvest, and mental health services were provided to assist those who were in isolation. A great deal of resources, time, and empathy were given to every case that required additional attention and support. This outreach service was the only one of its kind in the region, and it compassionately served the citizens of Nashville and Davidson County.

Recommendations:

    a. Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

    b. Maintain a list of viable community organizations that were helpful in providing wraparound services and use Where to Turn in Nashville (WTTIN) as a resource.

2.4.3. Strength: Epidemiologist communication and coordination with COVID-19 case investigators

Observation: Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation leadership team conducted weekly meetings to share information and updates from the Centers for Disease Control and Prevention (CDC) and the Tennessee Department of Health, answer investigator questions, and gather information regarding clusters and other trends throughout the city and county. Prior to the meeting, case investigators submitted questions or concerns to the epidemiology leadership team to better prepare for and address the issues that were of most concern. Moreover, a member of the epidemiology team was always available to address time-sensitive issues or emergencies that arose. The team also provided weekly email updates with links and background information to help investigators stay up to date on COVID-19 and pandemic guidance. Daily operations were also effectively and efficiently managed by the epidemiology team by assigning cases to investigators each morning as opposed to investigators assigning themselves cases.

Recommendation:

    a. Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.

2.4.4. Strength: Separate case investigation and contact tracing teams

Observation: MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care

Analysis: Surge staffing enabled team leadership to establish a separate contact tracing element that contacted only individuals in quarantine who had been exposed to a confirmed case, while the case investigations team monitored cases in isolation. This contact tracing team took a great deal of burden off epidemiologists, who might have been required to make multiple calls for one case if they were also required to monitor contacts. The contact tracing team enabled MPHD to provide contacts with essential monitoring attention. This included access to wraparound serves and free thermometer delivery if needed, since temperature monitoring was a way to determine if a close contact was becoming a case. Staffing for the case investigation and contact tracing teams eventually surged to over 150 people, and they were integral to MPHD's operations.

Recommendations:

    a. Capture mass case investigation processes and procedures in future pandemic planning efforts.

    b. Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

2.4.5. Strength: COVID-19 case investigation training

Observation: Training was the key to the success of MPHD's COVID-19 case investigation operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: The case investigation team was staffed with both MPHD internal staff and temporary surge staff with diverse professional backgrounds. Due to this, the case investigation epidemiologist leadership team developed COVID-19 investigation for team members who were less experienced with epidemiological protocols, case monitoring, and contact tracing procedures. The training was initially provided in person. Later, it was combined with an "investigator guide" that could be referenced later and provided investigators with helpful tools for completing investigations effectively. The training helped set expectations and provided material for investigators to become familiar with processes and procedures for case investigation. Guidance was updated, and investigators were briefed as case and contact monitoring guidance changed.

Recommendations:

    a. Consider including an investigator guide as an annex in future pandemic planning efforts.

    b. Memorialize case investigation processes and best practices for future pandemic planning efforts.

2.4.6. Strength: Implementation of the TeleTask Texting System

Observation: Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: At the height of COVID-19 case investigations, MPHD was receiving thousands new cases weekly, which made it nearly impossible to reach all cases and their associated contacts. Implementing the TeleTask Texting System helped make this a more manageable process by providing automated texts to the parties. Such texts would be sent to a positive case and the case's provided contacts. Included in the text was a survey with an abbreviated version of the questions asked by case investigators when contacted directly (see Figure 2). The data from the automated TeleTask survey was directly integrated into MPHD systems, which seamlessly collected the required information and demographics. The TeleTask texts could be translated into Spanish and Arabic and were integral to mass data collection efforts during increased caseloads.
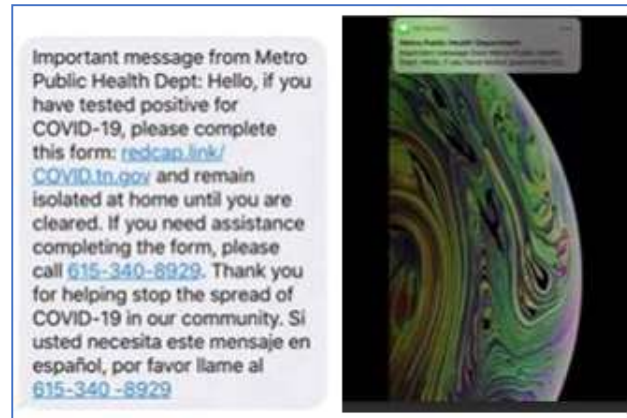

Figure 2: Sample TeleTask Message

Recommendation:

a. Consider maintaining a mass texting system for other MPHD public health efforts.

2.4.7. Strength: Development of the Davidson County COVID-19 Dashboard

Observation: In partnership with Metro Information Technology Services (ITS), MPHD utilized in-house expertise to create a public facing dashboard to track several data points.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning

PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning

Analysis: In conjunction with Metro ITS, MPHD developed a public facing COVID-19 GIS data dashboard, which allowed stakeholders to observe trends during the pandemic response and recovery. Data included case counts, historical data, hospitalizations, mortality, and testing. The dashboard also informed MPHD and city leadership by providing insight to quickly make decisions, with the data being analyzed and reported by skilled epidemiologists. At times, pressure from leadership made data analysis difficult and stressful on the already overtasked staff. However, this dashboard helped to make data reporting consistently accurate and robust. Information was reported daily, weekly, and eventually on a monthly basis until December 28, 2022, when the dashboard was archived for historical purposes.

Recommendations:

a. Train additional staff in the development of content for dashboards and related tools.

b. Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).

c. Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Figure 3: Davidson County COVID-19 Dashboard

2.4.8. Area for Improvement: Establishment of a social work component during large-scale case investigations

Observation: The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Mass Care

Analysis: During the case investigations, MPHD investigators quickly realized that to serve the citizens of Nashville and Davidson County better, their physical and mental needs required support, particularly in the early stages of the pandemic when isolation protocols were unfamiliar and public anxiety was high. Community resources were key to ensuring that individuals' needs were best served, but case investigators were not equipped or trained to easily provide direction on accessing those services. Case investigators invested a great deal of time to familiarize themselves with community resources to which cases could be referred. Cases that were expected to take only 20 minutes could quickly become day-long case management situations, which put massive stress on an already overtasked team. Later in the response, MPHD partnered with community organizations that helped to provide easy access to resources. However, the diverse needs of the community would have been better served with internal access to licensed and trained social workers or counselors familiar and in touch with community resources who could assist the case investigation team during large-scale operations like COVID-19.

Recommendations:

a. Establish an internal social work department to partner with case investigations during future large-scale operations.

b. Identify and include community-based organizations that support underserved communities to assist with case management.

c. Mature relationships developed during pandemic; include community partners in pandemic planning efforts.

2.4.9. Area for Improvement: Communication with the public regarding the TeleTask Texting System and timeliness of use

Observation: The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number of cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: Although the TeleTask Texting System was immensely helpful, there was some confusion with the public as to what the text meant or why they were receiving it. Stakeholders stated that people believed that the text was spam and an attempt to gain personal information, so many deleted it without providing the requested information. Moreover, implementing the TeleTask Texting System took longer than optimal because of the need to ensure that the messages sent and received would be HIPPA compliant. While the TeleTask Texting tool was helpful, it would have been valuable much earlier in the response when MPHD received an unmanageable number of cases each day.

Recommendations:

  a. Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.

  b. Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.

2.5. Public Information

This section provides strengths and areas for improvement related to public information activities during the COVID-19 pandemic.

2.5.1. Strength: Translation Services

Observation: MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: MPHD used several sources to provide verbal and written translations. In-house Spanish and Arabic translation teams efficiently translated vital medical documents, marketing information, education materials, and testing and vaccination flyers; updating ever-evolving guidance; and assisting at community events and with case investigations. Vendor services were used to translate languages outside of Spanish and Arabic, including Zomi, Swahili, Somali, Napali, Karen, and Burmese.

Figure 4: COVID-19 Protect Yourself Social Media Infographic in Burmese

With the help of translation services, MPHD's Social Media Coordinator designed infographics in multiple languages for social media campaign efforts. The case investigations team and the Strike Teams also had access to the Language Line to further expand translation capabilities. It was noted that, at times, translated printed materials were often delayed.

Recommendations:

a. Due to delays outside of MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.

b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

c. Ensure ample interpreters are available during community events, such as testing and vaccine PODs.

d. Ensure new and temporary employees are properly trained on Language Line operations.

e. Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.

2.5.2. Strength: The MPHD COVID-19 Hotline

Observation: Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: During the early stages of the response, MPHD coordinated with both Metro ITS and MPHD ITS to stand up a call center to receive calls from the general public on the MPHD COVID-19 Hotline. Just-in-time training was quickly developed so call center staff cold provide the most current information to callers. Hotline leadership provided a calming confidence that enabled staff to easily pivot based on daily reports or frequent changes to guidance. Call center staffing was primarily sourced from MPHD school nurses and in-school dental staff; it surged to 12 operators and one supervisor. To ensure consistent messaging, a hotline script was developed that was user-friendly, clear, and concise. It provided information on available resources and answers to frequently asked questions, which were updated often. As the general public became more familiar with COVID-19 procedures and testing operations were opened throughout the city, calls began to decrease. In October 2020, the COVID-19 Hotline transitioned outside of MPHD and over to hubNashville.

Recommendation:

a. Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

2.5.3. Area for Improvement: Availability of Translators

Observation: MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.

Core Capability: Public Information and Warning

PHEP Capability: Emergency Public Information and Warning

Analysis: It was noted that, at times, there were not enough translators to keep up with the volume of translation services requested. Translators were not always available during case investigations, contact tracing, Strike Team events, and other community events.

Recommendations:

a. Provide resources to recruit and retain additional bi-lingual staff members.

b. Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.

c. Consider procuring "as needed" contracts for translation services.

d. Ensure ample interpreters are available during community events, such as testing and vaccination PODs.

2.6. Social Services and Human Needs

This section provides strengths and areas for improvement related to social services and human needs activities during the COVID-19 pandemic.

2.6.1. Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations

Observation: MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Using data-driven decisions obtained through contact tracing and other surveillance methods such as tracking COVID-19 hotspots, MPHD prioritized responses to the region's most vulnerable populations. Community partners, such as the Tennessee Immigration and Refugee Rights Coalition (TIRRC) and Siloam and community leaders, were engaged to help MPHD reach the most vulnerable community members. When testing and vaccines were available, MPHD located testing and vaccination sites in communities throughout the county that might have been disproportionately affected by COVID-19. Teams from MPHD engaged vulnerable populations, including inmates, individuals experiencing homelessness, the elderly, those considered high-risk, and minority populations. MPHD teams also identified the need to support these groups where they were. Teams traveled to jails, assisted living facilities, half-way houses, shelters, places of worship, hospitals, and public areas to offer services. Homebound services were also offered to individuals who could not travel to vaccination sites because of limited mobility or other circumstances. Throughout the response, MPHD staff demonstrated professionalism and compassion toward the city and county's most at-risk groups.

Recommendations:

a. Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city and county's underserved and diverse communities.

b. Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.

2.6.2. Strength: Community Health Worker Program

Observation: MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD partnered with Siloam Health to provide at least three weeks of follow-up care for patients who met certain criteria and were referred to the Community Health Worker (CHW) program. A CHW was a member of the patient's community who could communicate with the patient utilizing the patient's spoken and written language. CHWs provided wraparound services with the long-term goal of successfully completing isolation. CHWs helped patients access resources, including health insurance, food, housing, quality care, and health information while ensuring that health conditions were understood, and strategies were in place to improve the patient's overall wellbeing. All wraparound services were delivered using culturally and linguistically appropriate terminology and concepts. CHWs provided informal counseling, support, and follow-up. When necessary, they connected patients with MPHD for further services. The CHW's highest priorities were to establish trust with the individuals with whom they were working and to collaborate with MPHD monitors and investigators to best serve the patient.

Recommendations:

a. Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.

b. Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.

2.6.3. Strength: Support for incarcerated individuals

Observation: Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: Early in MPHD's response, MPHD recognized the need to quickly develop just-in-time training for Strike Team members to deploy to Metro jails to provide education, contact tracing, isolation and quarantine guidance, planning, testing, and vaccination services to Davidson County inmates. Despite the potential for a catastrophic disaster, MPHD's correctional health team worked diligently to best support this unique population until April 2022, when support services were fully turned over to a third-party contractor.

Recommendations:

a. Develop more robust mutual aid agreements with the Sherriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

b. Include response partners in future pandemic planning to ensure that fully developed response plans are created.

2.6.4. Strength: Support for individuals experiencing homelessness

Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: In partnership with Nashville OEM and Metro Social Services and without existing city plans, MPHD dedicated an abundance of resources to ensure that the unique needs of individuals experiencing homelessness were met. For those displaced by the pandemic, shelter services were quickly established at the fairgrounds and the Brick Church Pike Shelter. In addition, clean and safe non-congregate isolation and quarantine spaces were provided through collaboration with the Nashville Rescue Mission and Room in the Inn. MPHD also worked with the Homeless Impact Division and other community partners to

provide equitable care for the homeless community by arranging for transportation to and from the hospital and providing testing and vaccination events specifically targeted toward individuals experiencing homelessness. Strike Teams traveled to established homeless and transient camps to provide testing and vaccination services, often returning to ensure subsequent doses of the COVID-19 vaccine were administered to individuals. The constant presence of MPHD staff helped to build trust with transient communities and those experiencing homelessness.

Recommendations:

    a. The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.

    b. Maintain contracts with transport vendors for future public health events.

2.6.5. Area for Improvement: Increase advertisement efforts for community events

Observation: More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped reach more members of vulnerable communities.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD and the City of Nashville prioritized vulnerable and underserved communities with countless resources and wraparound services throughout the pandemic. Dedicated staff worked tirelessly to serve the city and county's most vulnerable populations, but there was a lack of citywide cohesive response efforts to serve these communities. At times, this limited the visibility of the resources that *were* available. Future responses should include efforts to coordinate with city and county departments and community-based organizations to ensure that vulnerable communities have better visibility on available resources and events designed to support them.

Recommendation:

    a. Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.

2.6.6. Area for Improvement: Consistent promotion of wellness and mental health resources for MPHD staff

Observation: More mental health wellness resources are needed for MPHD staff when activated for sustained complex response operations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care

Analysis: MPHD staff were activated on February 27, 2020, when MPHD initially stood up COVID-19 response operations. They did not officially stand-down pandemic response operations until December 31, 2022. Through 34 months of the pandemic response, many staff in MPHD worked nonstop. While dedicated to the success of MPHD's response, many positions had limited trained staff available to backfill roles, which resulted in fatigue and frustration. Many stakeholders noted that the availability of mental health support was not adequate to support the long-term well-being of staff in MPHD.

Recommendations:

a. Use city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation.

b. Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation.

c. Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.

2.7. COVID-19 Testing

This section provides strengths and areas for improvement related to COVID-19 testing activities during the COVID-19 pandemic.

2.7.1. Strength: COVID-19 assessment center accessibility

Observation: Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Assessment centers were established throughout the city to ensure widespread access to COVID-19 testing for all community members. Assessment center types and locations were diverse, with flexible operating hours to accommodate as many residents as possible. The city maintained three large drive-thru assessment centers: Kmart, Nissan, and Meharry. These sites could accommodate large numbers of people and provide regular testing throughout the city. To ensure health equity, assessment centers were strategically placed throughout Davidson County in areas that would provide easy access to vulnerable and underserved populations. In addition, Strike Teams provided testing capabilities to communities that might have difficulty traveling to testing sites. COVID-19 assessment center operations were a true community effort, with several organizations coordinating to serve the residents of Nashville and Davidson County expertly and compassionately.

Figure 5: Nissan Assessment Center

Recommendations:

a. Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.

b. Hold assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

c. Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.

2.7.2. Strength: Strike Team testing support

Observation: MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning

PHEP Capability: Public Health Laboratory Testing

Analysis: Throughout 2020, when COVID-19 testing became available, Strike Teams hosted testing events 7 days per week, often with extended hours outside of 8 am to 5 pm, to accommodate the working populations. Teams also established a few standing testing events each week, so community members were aware of the locations to receive needed or desired testing. In addition, Strike Team members were heavily connected with community leaders and partners, reaching out to inquire about recommended testing locations within the community. Teams were consistently available and were rarely unable to accommodate a request for a testing event. Strike Teams were flexible, accommodating, and innovative in providing testing services to vulnerable populations.

Recommendation:

a. Increase efforts to advertise Strike Team testing event locations to reach a larger audience.

Figure 6: Strike Team supporting Lentz pop-up drive-thru testing event on New Year's Eve 2021

2.8. COVID-19 Vaccination

This section provides strengths and areas for improvement related to COVID-19 vaccination activities during the COVID-19 pandemic.

2.8.1. Strength: Multi-agency vaccination efforts

Observation: Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, the Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: The partnership between MPHD and supporting organizations to distribute and provide vaccines in the population centers throughout the city executed a well-coordinated and effective strategy. The efforts to remove obstacles for access included mass drive-thru and walk-in PODs, Strike Team pop-up events in underserved communities, home visits for community members who could not access vaccination events, translation services, and multiple communication mechanisms to inform the public of events taking place throughout the city and county.

Recommendation:

a. Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.

2.8.2. Strength: Mass vaccination PODs at Music City Center and Nissan Stadium

Observation: With the support of community partners, MPHD planned and managed mass vaccination PODs at Music City Center (MCC) and Nissan Stadium, which were highly successful in providing residents with COVID-19 vaccines.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management

Analysis: The MCC vaccination POD was a monumental undertaking led and operated by MPHD in collaboration with several community partners, including MCC staff, Hands On Nashville, OEM, and Metro Parks. The MCC POD opened on January 30, 2021, to begin administering the Pfizer vaccine to people 75 and older and those that qualified in 1a1. People were required to have an appointment to receive the vaccine. Parking was free in nearby parking structures, and there was a complimentary shuttle to the POD entrance. Hands On Nashville volunteers assisted with wheelchair access, and they directed patients to appropriate vaccination lines for quick and efficient processing. The MCC POD was well organized and expertly managed, and it received praise from all involved stakeholders, partner agencies, and the general public. The Music City Center POD was in operation until May 28, 2021, and it administered 107,366 free vaccine doses.

The Nissan Stadium POD was a one-day drive-thru vaccination event planned in 18 days by dedicated MPHD staff members, and it was a true model of community care. MPHD's employees volunteered to help staff the POD, along with the support of local community partners ranging from Metro police and fire departments, the Nashville Department of Transportation, Hands On Nashville volunteers, the Tennessee National Guard, and personnel from Bellmont Nursing and Pharmacy Schools and the Vanderbilt Nursing School. Routes and traffic control plans, along with proper signage, helped maintain the flow of traffic and prevented traffic from impacting areas near the venue. Furthermore, many in the community were made aware of the event through extensive media coverage and having several local news outlets on site. The whole community, alongside MPHD, stepped up to ensure that people were vaccinated in a timely, organized, and efficient manner. This event proved to be a massive success for the city and MPHD, and it resulted in 10,107 vaccines given in a single day.

Figure 7: MPHD Mass Vaccination POD at the Music City Center

Figure 8: POD at Nissan Stadium

Recommendations:

a. Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

b. Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.

c. Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.

2.8.3. Strength: MPHD Vaccination POD Planning Teams

Observation: With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.

Core Capability: Planning

PHEP Capability: Medical Countermeasure Dispensing and Administration

Analysis: Subject matter experts from MPHD planned the vaccination PODS at both MCC and Nissan Stadium in a short timeframe and with limited guidance. Their efforts created extensive plans that included coordination with multiple community partners, detailed traffic and crowd flow, consideration for vulnerable populations and those with access and functional needs, media engagement, and follow -on education. The Nissan Stadium POD, which was planned and executed in 18 days, provided Johnson & Johnson vaccine to culminated with over 10,000 Davidson County residents in one day receiving the Johnson & Johnson shot. The MCC POD operated in downtown Nashville for four months. The planning team expertly designed the MCC's operations in 8 days. The MCC POD administered over 100,000 Pfizer doses, including booster doses. The expertise, innovation, and dedication of the MPHD planning teams were integral to the success of the mass vaccination PODs at MCC and Nissan Stadium.

Additionally, the planning and logistical efforts of the PHEP Department largely influenced the Nissan and MCC PODs and contributed to their successes. Before operations at MCC and Nissan Stadium, the MPHD site (Lentz) was used to provide vaccines to the elderly (those in Tier 1). Because this was a more vulnerable population, MPHD staff attempted to maintain social distancing among patients while keeping them out of the frigid temperatures, since the PODs were being held in January 2021. The PHEP team planned the flow of the POD, set up multiple vaccination stations inside, set up a waiting area in the lobby, and allowed for ingress and egress so the maximum number could wait inside both before and after their vaccine. PHEP also developed a traffic flow plan that enabled people to park and wait in their cars and then be released on a first in–first out basis. Also, there was the added benefit of doing this POD at MPHD's home base. This experience gave MPHD guidance for future PODs at Lentz, which has since been implemented there.

Recommendations:

a. Include a mass POD plan annex in future pandemic planning efforts.
b. Train and exercise mass POD operations.

2.8.4. Strength: Vaccination standby list

Observation: To ensure all doses from a vial were used, MPHD developed a vaccine standby list for those willing to get COVID-19 vaccinations at the last minute.

Core Capability: Planning, Public Information and Warning

PHEP Capability: Medical Countermeasure Dispensing and Administration, Information Sharing

Analysis: Because of the increased demand for vaccines and to ensure that all doses were utilized, MPHD developed a standby list for those interested in receiving the COVID-19 vaccine on short notice. The public could email their contact information to an MPHD inbox, with the understanding that they could arrive at the vaccination POD 20 minutes before the site closed and receive a vaccination. Toward the end of the day, MPHD staff would contact the vaccine site to confirm the number of remaining doses. Once doses were confirmed to still be available, individuals on the standby list were contacted and informed to go to the site to receive their dose. This strategy also strengthened MPHD's social media presence within the community.

Recommendation:

N/A.

2.9. Strike Team Operations

This section provides strengths and areas for improvement related to strike team operations activities during the COVID-19 pandemic.

2.9.1. Strength: Strike Team operations and management

Observation: MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.

Core Capability: Public Health, Healthcare, and Emergency Medical Services

PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration

Analysis: MPHD Strike Teams comprised temporary contract employees who were quickly onboarded to support testing operations. Their role eventually expanded to support vaccination efforts as well. Strike Team members were passionate about serving the communities they worked in every day and could earn trust with community leaders and members. Team members selflessly worked in extreme conditions like rain, snow, and blazing heat, and they rarely complained. Testing and vaccine sites were kept open later to accommodate working families or those who could not get to sites during more traditional hours. Despite the challenges associated with temporary staff, Strike Teams remained well-staffed throughout the pandemic and were flexible enough to meet the needs of community members. From January 4, 2021, to December 30, 2022, Strike Team members administered 39,905 vaccines.

Recommendations:

a. Record Strike Team operating procedures in future pandemic planning.

b. Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.

c. Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

2.9.2. Area for Improvement: Additional translation services available at Strike Team events

Observation: Strike Teams did not always have access to translation services, which would have helped serve the communities in which they were deployed better.

Core Capability: Operational Coordination, Mass Care Services

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: Throughout the pandemic, Strike Teams provided education, testing, and vaccination support for the most underserved communities in Nashville, many who had little or no English. While access to translation services through the Language Line was an option, it was not efficient in face-to-face settings. Many Strike Team members relied on translation applications on personal cell phones or on communication with English-speaking family members. MPHD did add Spanish-speaking translators late in the team's response, but the early addition of a translator at Strike Team events would have been beneficial to building rapport and trust with the communities being served.

Recommendations:

a. Increase recruiting efforts for bi-lingual staff members.

b. Consider incentivizing existing bi-lingual staff members.

c. Commit to providing translators and translated materials at community testing and vaccine Strike Team events.

2.10. Technology

This section provides strengths and areas for improvement related to technology during the COVID-19 pandemic.

2.10.1. Strength: Metro ITS liaison integration with MPHD

Observation: Early in the response Metro ITS assigned a liaison to MPHD, which greatly helped with assessing MPHD's technical needs.

Core Capability: Operational Communications, Public Information and Warning

PHEP Capability: Emergency Public Information and Warning, Information Sharing

Analysis: Early in the response, MPHD partnered with Metro ITS, who offered a highly trained liaison who integrated into MPHD to assist with MPHD's technical needs. This partnership proved to be critical to the MPHD's early success with communication. The liaison worked with MPHD staff and the IT department to quickly develop technology solutions to key functions such as broadcasting to the public, including closed captions, video conferencing on a large scale, and rapidly establishing MPHD's Hotline. This also made it possible to set up accounts for new employees quickly and get them equipment on the day of hire.

Recommendations:

a. Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.

b. Develop operating guides for establishing broadcasting and video conferencing capabilities.

2.10.2. Area for Improvement: RedCap project as Vaccination Scheduler

Observation: RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD developed a RedCap project for COVID-19 vaccination appointments. However, the program was not designed for the volume of appointment requests received, and it had several issues in maintaining operations. Staff were required to constantly monitor the software and release only a designated number of appointments at a time to prevent the program from crashing. The limited availability of appointments caused frustration for patients, and it contributed to perceived delays in accessing vaccines. Although RedCap provided the intended service, it was not the most efficient way to schedule the volume of vaccination appointments that the response required.

Recommendations:

a. Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.

b. Coordinate with Metro ITS to explore in-house scheduling solutions that communicate with the MPHD Electronic Health Record System and HIPAA compliant.

2.10.3. Area for Improvement: Case investigations did not utilize RedCap earlier in the case monitoring process

Observation: RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method caused several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.

Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination

PHEP Capability: Public Health Surveillance and Epidemiological Investigation

Analysis: In the early stages of case monitoring and contact tracing, MPHD utilizing a Microsoft Excel spreadsheet stored on MPHD's SharePoint page to save monitoring and contact tracing notes. This method had benefits, such as ease of use, and it allowed for simultaneous users. However, SharePoint was slow to load at times, and on several occasions, staff accidently deleted data from the spreadsheet. This required reverting to an older version of the spreadsheet. Eventually, and at the height of the pandemic, the case investigation team developed a RedCap project to capture case and contact data more efficiently and eliminate the need to store data in less-reliable means. Using RedCap was a vast improvement in storing case notes, but it would have been far more beneficial earlier in the response.

Recommendation:

a. Record the use of RedCap as the initial tool for storing data and build any necessary RedCap projects as early as possible.

2.11. Resources, Procurement, and Supply Chain Management

This section provides strengths and areas for improvement related to resources, procurement, and supply chain management activities during the COVID-19 pandemic.

2.11.1. Strength: MPHD Public Health Emergency Preparedness Logistics Operations

Observation: MPHD PHEP team expertly managed logistical operations throughout the pandemic.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness

Analysis: Through many years of planning and preparation, the MPHD PHEP logistics team could exceptionally support not only MPHD but also several healthcare facilities in Davidson County with the deployment of personal protective equipment (PPE) when other larger government agencies in the state were unable to do so. In addition, the logistics team expertly provided PPE and POD resources to MPHD testing and vaccination PODs for over two years. Standard operating procedures dictated that the PHEP logistics team ordered and stored PPE annually with end-of-year funding. This ongoing practice made PPE available throughout the pandemic. The available PPE included gowns, face shields, gloves, and most importantly, N95 masks. The pre-planning of the MPHD PHEP logistics team helped MPHD respond to the COVID-19 pandemic effectively and protect the lives of the staff and the public.

Recommendation:

a. Monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to date list of supplies is kept in the PHEP warehouse inventory control program.

2.11.2. Strength: Mask distribution efforts

Observation: MPHD made every effort to provide masks throughout the pandemic response.

Core Capability: Supply Chain Integrity and Security, Planning

PHEP Capability: Emergency Operations Coordination, Mass Care

Analysis: By using drive-thru mask distribution PODs, passive distribution stations at facilities or event entrances and by teams walking through malls or along city streets, MPHD made every effort to provide masks to the residents and visitors of Nashville and Davidson County. MPHD consistently ordered, stored, and delivered masks to staff, facilities, and partners throughout the county. Teams of MPHD staff traveled to high traffic and public areas to hand-deliver masks in the evenings and over the weekend, and they educated the general public about the importance of wearing masks. Based on the Governor's orders, MPHD staff established a mask distribution POD and provided masks to those who formed a line outside of the building. MPHD remained committed to mask distribution efforts throughout the COVID-19 response and recovery efforts.

Recommendation:

N/A.

2.12. Order Enforcement

This section provides strengths and areas for improvement related to order enforcement activities during the COVID-19 pandemic.

2.12.1. Strength: Online Event Application Process

Observation: MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Using RedCap software, MPHD developed an online private event approval application that was flexible and easy to update as the Mayor's orders altered regulations. Through a series of questions related to the event, the software identified the number of attendees that could attend the gathering. After reviewing a questionnaire, an MPHD team member would have a detailed conversation with event planners to offer guidance or suggestions that could make events safer or potentially allow additional attendees. The seven largest convention hotels in the city followed a separate process in which MPHD teams coordinated with each establishment to make site visits and measure each convention room to establish a pre-planned, pre-determined maximum number of attendees. This was based on event criteria, such as alcohol consumption, seated vs. standing accommodation, and whether attendees were eating. The effort of the MPHD team to develop the event application process safely regulated events citywide and created public trust.

Recommendation:

a. Capture the online event application process in pandemic planning efforts.

2.12.2. Strength: MPHD Director's Health Order enforcement efforts

Observation: MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: MPHD's Environmental Health Department organized a small team of 16 restaurant inspectors who reviewed and responded to daily health order violations reported by the general public on an online reporting tool. Team members contacted business owners to notify them about the reported violation and provided expectations and consultation on how the violator could comply with the health order, as opposed to directly using punitive enforcement. The efforts of MPHD were exceptional, but it was quickly evident that MPHD was not equipped or trained to handle volatile situations that arose in order enforcement situations. Continuing to engage MNPD early in responses of this magnitude is key to ensuring proper and safe enforcement activities.

Recommendations:

    a. Engage response partners, including MNDP, in pandemic planning and Director's Health Order enforcement efforts.

    b. Provide education and guidance to MNPD during Director's Health Order enforcement operations.

2.13. COVID-19 Variants

This section provides strengths and areas for improvement related to COVID-19 variants during the COVID-19 pandemic.

2.13.1. Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community

Observation: With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.

Core Capability: Operational Coordination

PHEP Capability: Emergency Operations Coordination

Analysis: With each COVID-19 variant surge, MPHD quickly altered response activities as needed to best serve the community. MPHD leadership and public information personnel tracked emerging variants and released information to the public using press conferences and social media campaigns, emphasizing the importance of non-pharmaceutical interventions, vaccines, and vaccine boosters. Strike Teams held additional events within communities most affected, and a short notice vaccination POD at Lentz was established on New Year's Eve in 2021. MPHD continued to update and communicate direction on all available platforms in accordance with CDC and Tennessee Department of Health guidance.

Recommendation:

    a. Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.

2.14. Finance

This section provides strengths and areas for improvement related to finance activities during the COVID-19 pandemic.

2.14.1. Area for Improvement: Lack of standardized method to track spending

Observation: Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.

Core Capability: Economic Recovery

PHEP Capability: Community Recovery

Analysis: Stakeholders stated that, in the absence of standardized tracking methods for spending, individuals tracked information such as requisition numbers, purchase order numbers, line-item orders, costs, vendors, and the location where the item was deployed without being directed to do so. Throughout the response, there was not a standardized method of tracking items purchased, and not all items were tracked in the same way. The lack of an established method to track spending could create difficulties in cost recovery and requisition.

Recommendations:

   a. Develop standardized purchasing and tracking processes and train staff on these procedures.

   b. Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.

   c. Incorporate purchasing and tracking of purchasing into RHOC operations during activation.

2.15. Recovery and Demobilization

This section provides strengths and areas for improvement related to recovery and demobilization activities during the COVID-19 pandemic.

2.15.1. Strength: Phased demobilization strategy

Observation: MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.

Core Capability: Operational Coordination, Planning

PHEP Capability: Emergency Operations Coordination

Analysis: Due to lessons learned from conducting demobilization operations too quickly, MPHD developed a demobilization strategy that would slowly end operations using a phased approach. Vaccine and testing operations transitioned primarily to the Strike Teams, with vaccines also being offered in MPHD clinics. The PHEP team assessed supply levels and monitored the return of equipment from the PODs. Warehouse inventory management is an ongoing process that will continue to develop over time.

Recommendation:

   a. Capture demobilization and recovery procedures in pandemic planning efforts.

2.15.2. Area for Improvement: Better public communication about Strike Team demobilization

Observation: Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.

Core Capability: Operational Coordination, Public Information and Warning

PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning

Analysis: Strike Teams were critical to serving Nashville's most vulnerable populations, and many community members relied on the accessibility offered by their events. However, stakeholders noted that there was an overall lack of communication to communities who depended on the events when Strike Team operations were coming to an end. Strike Team members worked hard to build trust and rapport with the communities they were serving, and the lack of communication could affect a long-term effective relationship between MPHD and these communities.

Recommendation:

    a.   Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.

3. Conclusion

The Nashville Metro Public Health Department continues to recover from the COVID-19 pandemic. Due to the magnitude of the response, it is likely recovery efforts will be ongoing for the foreseeable future. This AAR provides key findings that demonstrate strengths for codification as best practices and areas for improvement that can be addressed immediately, which will further improve recovery efforts and future responses. The recovery from COVID-19 cannot be solved by one single entity, and the responsibility is on all of MPHD to address these gaps.

MPHD's greatest strength is the dedication, innovation, and flexibility of its workforce. MPHD is committed to public health and has worked tirelessly to adapt quickly to the changing environment during the pandemic response. Staff worked to balance the needs of the pandemic with the daily and routine commitments in other essential public health services. MPHD has an effective and compassionate workforce that successfully led MPHD during the COVID-19 pandemic, with a sharp focus on health equity and the importance of protecting and reaching the most vulnerable individuals. A shining example of this is the efforts of the Strike Teams to build relationships with community leaders and members of the most underserved parts of the city and for MPHD to ensure the availability of assessment centers and vaccination sites throughout the city and county. Partnerships also developed and strengthened with traditional and non-traditional partners who were crucial to the overall success of MPHD's response. These should be fostered for future public health efforts.

MPHD stakeholders are encouraged to use the findings in this report to further refine recovery efforts related to the COVID-19 pandemic and the plans, procedures, and training needed to support future emergency response efforts. In addition, MPHD is encouraged to consider implementing the practice of completing interim AARs for future lengthy responses similar to the COVID-19 response. The findings of this AAR have been incorporated into the attached Improvement Plan, which will help guide efforts to build on the information identified and analyzed in this report.

Appendix A: Improvement Plan

This Improvement Plan (IP) was developed for the Nashville Metro Public Health Department (MPHD)as part of the after-action review process. Observations and recommendations in the IP were established as a collaborative planning effort with key stakeholders. Areas for Improvement with highlighted recommended actions and corresponding lead agency, agency point of contact, start date, and end date are listed in Table 2. Table 3 of the IP highlights MPHD's strengths with recommended actions for implementation.

Table 2: Improvement Plan – Areas for Improvement

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (a)	AFI: Commitment to utilizing the ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with the department's response approach and did not fully utilize the ICS.	Assign and properly train key primary and alternate Regional Health Operations Center (RHOC) positions.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (b)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Consider cross-training RHOC positions to ensure staff coverage.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.1.2 (c)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Provide ICS training/refresher training for all MPHD staff and develop internal drills to further familiarize staff with the ICS structure and MPHD response procedures.	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.1.2 (d)	AFI: Commitment to utilizing ICS during response operations	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination, Community Preparedness	Stakeholders noted that throughout the response MPHD leadership were not consistent with MPHD's response approach and did not fully utilize the ICS.	Establish the role and responsibilities of the Executive Leadership Team (ELT) during response operations.	ELT	Director of Health, Deputy Directory of Health, CDEP Bureau Director, Medical Director	July 1, 2023	Ongoing
2.1.3 (a)	AFI: Enhanced screening of temporary staff candidates	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	Stakeholders noted that need for better screening of temporary staff during operations that required the need for surge staffing.	Develop protocols for screening and hiring temporary and contract employees.	MPHD HR	HR Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.2.2 (a)	AFI: MPHD leadership's communication to staff	Core Capability: Operational Communications, Situational Assessment PHEP Capability: Information Sharing	Through survey data and interviews, stakeholders indicated that there was a lack of communication from MPHD leadership, particularly early in the response.	Develop a standing internal communications tempo using staff meetings/briefings, emails, newsletters, etc. to encourage transparency.	ELT	Director of Health, Deputy Director of Health, Medical Director, Communications Division	July 1, 2023	Ongoing
2.4.8 (a)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers who were more familiar with community resources.	Establish an internal social work department to partner with case investigations during future large-scale operations.	ELT	Preventative Health Bureau Director, Behavioral Health Program Director	As needed	As needed
2.4.8 (b)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Identify and include community-based organizations that support underserved communities to assist with case management.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.8 (c)	AFI: Establishment of a social work component during large-scale case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	The case investigations team took great care to provide the best service possible to COVID-19 cases that required additional community resources. This function could have been more efficiently and effectively served by licensed and trained social workers better familiar with community resources.	Mature relationships developed during pandemic; include community partners in pandemic planning efforts.	Health Equity, Strike Team, PHEP	Health Equity Bureau Director, Strike Team Leader, PHEP Program Director	July 1, 2023	Ongoing
2.4.9 (a)	AFI: Communication with the public regarding the TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Provide clear guidance to the public through social media, web sites, or public address regarding new MPHD technologies.	Vaccine Preventable Disease (VPD)	VPD Program Director and Team	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.4.9 (b)	AFI: Communication with the public regarding the use of TeleTask Texting System and timeliness of use.	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The TeleTask Texting System was an excellent tool that enabled the MPHD case investigations team to reach a larger number or cases. However, many stakeholders noted that the general public was unaware of the purpose of the texts they received, and the platform took longer than optimal to become operational.	Record lessons learned from the use of TeleTask to streamline the approval process for future mass-texting applications.	VPD and MPHD PIO	VPD Program Director and Team and MPHD PIO	July 1, 2023	June 30, 2029
2.5.3 (a)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Provide resources to recruit and retain additional bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (b)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.5.3 (c)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Consider procuring "as needed" contracts for translation services.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.5.3 (d)	AFI: Availability of Translators	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide interpretation services, but at times, there were not enough translators during key community outreach events.	Ensure ample interpreters are available during community events, such as testing and vaccination PODs.	MPHD HR, Translation Services	HR Program Director, Translation Services Director	As needed	As needed
2.6.5 (a)	AFI: Increase advertisement efforts for community events	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More aggressive advertising of community outreach events using methods such as news media, social media, radio, and additional multi-language advertisements might have helped to reach more members of vulnerable communities.	Develop a working group with city and county response partners to develop a citywide approach to reaching the county's most vulnerable communities.	MPHD PIO, Strike Team, Health Equity	MPHD PIO, Strike Team Leader, Health Equity Bureau Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.6.6 (a)	AFI: Consistent promotion of wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Utilize city mental health resources available through Nashville government human resources to ensure that crisis counseling is available to all response staff, including temporary contract employees, who support the response, both during and following an activation	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029
2.6.6 (b)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Review and, if necessary, update RHOC activation and operations procedures to include activation of staff mental health resources upon MPHD emergency response activation	PHEP	PHEP Program Director	July 1, 2023	June 30, 2029
2.6.6 (c)	AFI: Consistent wellness and mental health resources for MPHD staff	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	More mental health wellness resources are needed for MPHD staff when activated for sustained, complex response operations.	Ensure employees are aware of the Employee Assistance Program (EAP) resources for those needing wellness and mental health services.	MPHD HR	HR Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.9.2 (a)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Increase recruiting efforts for bi-lingual staff members.	Strike Team, Translation Services	Strike Team Leader, Translation Services Program Director	As needed	As needed
2.9.2 (b)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Consider incentivizing existing bi-lingual staff members.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed
2.9.2 (c)	AFI: Additional translation services available at Strike Team events	Core Capability: Operational Coordination, Mass Care Services PHEP Capability: Emergency Operations Coordination, Mass Care	Strike Teams did not always have access to translation services which would have helped serve the communities in which they were deployed better.	Commit to providing translators and translated materials at community testing and vaccine strike team events.	MPHD HR, Translation Services	HR Program Director, Translation Services Program Director	As needed	As needed

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.2 (a)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues because of the system's limitations.	Research and procure commercial off-the-shelf appointment scheduling software suited for a mass scheduling event that will better serve MPHD and the community.	MPHD ITS Bureau	MPHD ITS Bureau Director	July 1, 2023	June 30, 2029
2.10.2 (b)	AFI: RedCap project as Vaccination Scheduler	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	RedCap software was used as MPHD's vaccine appointment platform, which created issues due to because of the system's limitations.	Coordinate with Metro ITS to explore in-house scheduling solutions that communicates with the MPHD Electronic Health Record System and are HIPAA compliant.	Metro ITS, MPHD ITS Bureau, MPHD Electronic Health Record	Metro ITS Program Director, MPHD ITS Bureau Director, Electronic Health Record Planning Team Lead	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.10.3 (a)	AFI: Case investigations did not utilize RedCap earlier in the case monitoring process	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	RedCap software was not initially used as a tool to keep case notes for the monitoring of COVID-19 cases and close contacts. Instead, a Microsoft Excel spreadsheet stored on SharePoint was used. This method proved to cause several issues that would have been eliminated if RedCap had been used earlier in the case monitoring process.	Record the use of RedCap as the initial tool for storing data during case monitoring and contact tracing operations.	PHEP	PHEP Epidemiologist	July 1, 2023	June 30, 2029
2.14.1 (a)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Develop standardized purchasing and tracking processes and train staff on these procedures.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (b)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Implement a financial tracking mechanism to validate purchases made, items received, vendors paid, and confirmation of delivery.	MPHD Finance Bureau	Finance Bureau Director	July 1, 2023	June 30, 2029
2.14.1 (c)	AFI: Lack of standardized method to track spending	Core Capability: Economic Recovery PHEP Capability: Community Recovery	Stakeholders noted that there was a lack of standardized tracking methods or templates to track spending.	Incorporate purchasing and tracking of purchasing into RHOC operations during activation.	MPHD Finance Bureau, PHEP	Finance Bureau Director, PHEP Program Director	July 1, 2023	June 30, 2029

Reference	AFI	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)	Lead Agency	Agency POC	Start Date	End Date
2.15.2 (a)	AFI: Better public communication about Strike Team demobilization	Core Capability: Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning	Stakeholders noted a lack of public communication with community members when Strike Team operations were demobilizing and no longer offering services.	Ensure proper care is given to effectively communicate the end to future MPHD Strike Team operations in underserved and vulnerable communities.	Strike Team, MPHD PIO	Strike Team Leader, MPHD PIO	As needed	As needed

Table 3: MPHD Strengths

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.1.1 (a)	Strength: Quick onboarding of temporary workers for surge staffing	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Medical Surge	MPHD management, RHOC staff, recruiters, and the Human Resources (HR) Department worked well together to streamline the hiring process to quickly onboard temporary staff to fill critical positions during the height of the COVID-19 response.	Implement standing contracts with companies on an "as needed" basis, particularly with surge staffing for the following specialties: case investigators, contact tracers, social workers/counselors, strike team members.
2.2.1 (a)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Maintain and mature the relationships formed during MPHD's response.
2.2.1 (b)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and non-traditional partners and stakeholder groups.	Maintain contact lists for appropriate stakeholder coordination groups to engage in future response and recovery efforts.
2.2.1 (c)	Strength: Communication with external partners	Core Capability: Operational Communications, Planning PHEP Capability: Community Preparedness, Emergency Operations Coordination	MPHD benefited from increased engagement with traditional and nontraditional partners and stakeholder groups.	Include special interest groups in future public health preparedness drills and exercises.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.1 (a)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Memorialize the Unified Command Structure in future Emergency Operations or Pandemic Planning.
2.3.1 (b)	Strength: Early establishment of working relationships between MPHD, OEM, and the Mayor's Office	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	Frequent coordination and communication between MPHD, Nashville Office of Emergency Management (OEM), and the Mayor's Office strengthened working relationships, created a better understanding of response roles, and better served the citizens of Nashville.	Continue to mature and leverage response partnerships developed during the COVID-19 response through joint planning, training, and exercise events.
2.3.2 (a)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notification of positive cases.	Continue to maintain interfacing capabilities for future needs.
2.3.2 (b)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Capture interfacing/query capability in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.3.2 (c)	Strength: Partnership with Nashville Department of Emergency Communications in developing the COVID-19 query project	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD partnered with Metro Nashville Department of Emergency Communications (DEC) to provide an updated list of COVID-19 positive cases to help develop the COVID-19 query project, which provided first responders with notifications of positive cases.	Incorporate database interfacing capability into future exercises and drills.
2.4.1 (a)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Record case investigation processes and procedures for future pandemic planning efforts.
2.4.1 (b)	Strength: COVID-19 case investigation operations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	The Epidemiology team went above and beyond to manage COVID-19 case investigations efficiently and effectively for MPHD.	Consider procuring standing contracts with companies on an "as needed" basis for future surge staffing needs.
2.4.2 (a)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Capture community-based wraparound resources available in future pandemic planning efforts; include community partners in planning events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.2 (b)	Strength: Wraparound services provided during COVID-19 case investigations	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Mass Care	As part of the case investigation process, the citizens of Nashville and Davidson County were provided unprecedented connections to community resources.	Maintain a list of viable community organizations that were helpful in providing wraparound services and use Wear to Turn in Nashville (WTTIN) as a resource.
2.4.3 (a)	Strength: Epidemiologist communication and coordination with COVID-19 case investigators	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Communication and coordination between epidemiologists leading the COVID-19 case investigations and investigators conducting case and contact follow-up were key to their success.	Record case investigation processes, reference documented procedures, and best practices in future pandemic planning efforts.
2.4.4 (a)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Capture mass case investigation processes and procedures in future pandemic planning efforts.
2.4.4 (b)	Strength: Separate case investigation and contact tracing teams	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Mass Care	MPHD's ability to quickly onboard temporary/contract staff allowed the establishment of separate case investigation and contact tracing teams	Consider procuring standing contracts with temp agencies on an "as-needed" basis for future surge staffing needs.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.5 (a)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Consider including an investigator guide as an annex in future pandemic planning efforts.
2.4.5 (b)	Strength: COVID-19 case investigation training	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Training was the key to the success of MPHD's COVID-19 case investigation operations.	Memorialize case investigation processes and best practices for future pandemic planning efforts.
2.4.6 (a)	Strength: Implementation of the TeleTask Texting System	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Public Health Surveillance and Epidemiological Investigation	Implementing the TeleTask Texting System enabled the MPHD case investigations team to reach a greater number of cases and contacts in a more efficient manner.	Consider maintaining a mass texting system for other MPHD public health efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.4.7 (a)	Strength: Development of the Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Train additional staff in the development of content for dashboards and related tools.
2.4.7 (b)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public-facing dashboard to track several data points.	Consider reevaluating and redesigning future data dashboards after the initial response phase to present data during all phases of the response, including recovery (e.g., vaccine).
2.4.7 (c)	Strength: Development of Davidson County COVID-19 Dashboard	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Public Information and Warning PHEP Capability: Public Health Surveillance and Epidemiological Investigation, Emergency Public Information and Warning	In partnership with Metro ITS, MPHD utilized in-house expertise to create a public facing dashboard to track several data points.	Consider coordinating with Metro ITS to explore additional data collection, data management, and data analytic solutions.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.5.1 (a)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Due to delays outside MPHD control, consider adding additional bi-lingual staff and/or procure standing contracts with companies on an "as-needed" basis to quickly increase staff with multi-language speaking capabilities.
2.5.1 (b)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Consider incentivizing existing bi-lingual MPHD staff during emergency declarations.
2.5.1 (c)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure ample interpreters are available during community events such as testing and vaccine PODs.
2.5.1 (d)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Ensure new and temporary employees are properly trained on Language Line operations.
2.5.1 (e)	Strength: Translation Services	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	MPHD made every attempt to provide both verbal and printed translations to the diverse citizens of Nashville and Davidson County.	Print adequate quantities of forms in alternate languages to ensure availability at pop-up testing and vaccination PODs and/or ensure forms are available electronically.
2.5.2 (a)	Strength: The MPHD COVID-19 Hotline	Core Capability: Public Information and Warning PHEP Capability: Emergency Public Information and Warning	Within days of MPHD's initial COVID-19 response, the MPHD COVID-19 Hotline was activated to provide educational resources to the citizens of Nashville and Davidson County.	Capture the COVID-19 Hotline's stand-up, operations, processes, and procedures for future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.1 (a)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Continue to mature and strengthen relationships with community partners and leaders through joint community outreach events to grow trust with the city's and county's underserved and diverse communities.
2.6.1 (b)	Strength: Early establishment of teams focused on identifying the needs of vulnerable and diverse populations	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD quickly prioritized vulnerable and underserved communities throughout Nashville and Davidson County and continued to make every effort to best serve these communities throughout the pandemic.	Capture MPHD's efforts to serve the region's vulnerable populations in future planning efforts and include community partners in pandemic planning.
2.6.2 (a)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Memorialize the CHW program as an option for MPHD to further support the diverse communities of Nashville and to support health equity with the city.
2.6.2 (b)	Strength: Community Health Worker Program	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	MPHD partnered with Siloam Health to provide referral-based follow-up care to COVID-19 cases actively in isolation who met the program criteria.	Continue to strengthen the partnership with Siloam Health through joint community outreach events to grow trust with the city's underserved communities.
2.6.3 (a)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Develop more robust mutual aid agreements with the Sheriff's Office to ensure MPHD's correctional health team's safety while working in jail facilities.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.6.3 (b)	Strength: Support for incarcerated individuals	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Capitalizing on a previously implemented jail program and contractual obligations to monitor health services in metro jails, MPHD swiftly partnered with the Metro Sheriff's Office and Core Civic to provide support and guidance to Davidson County inmates and staff.	Include response partners in future pandemic planning to ensure that fully developed response plans are created.
2.6.4 (a)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	The City of Nashville, in conjunction with community response partners, should consider leading a working group to develop extensive planning for future housing solutions during a pandemic for individuals experiencing homelessness.
2.6.4 (b)	Strength: Support for individuals experiencing homelessness	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care	Observation: MPHD identified innovative solutions to support individuals experiencing homelessness.	Maintain contracts with transport vendors for future public health events.
2.7.1 (a)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Record COVID-19 assessment center operations and community partnerships in future pandemic planning efforts.
2.7.1 (b)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Consider holding assessment events/days for individuals seeking tests for travel or events. This will help limit the volume of patients during peak hours or at events intended to serve vulnerable populations.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.7.1 (c)	Strength: COVID-19 assessment center accessibility	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	Testing sites were conveniently placed around the city to ensure easy access and to provide free testing to the public.	Maintain a list of sites that Strike Teams visited as helpful contacts for future outreach.
2.7.2 (a)	Strength: Strike Team testing support	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning PHEP Capability: Public Health Laboratory Testing	MPHD Strike Teams provided excellent COVID-19 testing support throughout the City of Nashville and Davidson County.	Increase efforts to advertise Strike Team testing event locations to reach a larger audience.
2.8.1 (a)	Strength: Multi-agency vaccination efforts	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Operational Coordination PHEP Capability: Medical Countermeasure Dispensing and Administration	Joint efforts were coordinated by MPHD, Metro government agencies, volunteer organizations, Tennessee National Guard, and the private sector to provide vaccines to anyone who qualified and wanted to receive the vaccine.	Update mass vaccination sections of MPHD's pandemic plan to include lessons learned from mass vaccination events.
2.8.2 (a)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Update mass vaccination sections of pandemic plans to include lessons learned from mass vaccination events.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.2 (b)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners, MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Continue to foster partnerships developed during the response to COVID-19 to coordinate with local community partners to plan, organize, and staff future large-scale vaccination PODs.
2.8.2 (c)	Strength: Music City Center and Nissan Stadium Vaccination PODs	Core Capability: Public Health, Healthcare, and Emergency Medical Services, Planning, Operational Coordination, Public Information and Warning PHEP Capability: Emergency Operations Coordination, Emergency Public Information and Warning, Volunteer Management	With the support of community partners MPHD planned and managed the Music City Center (MCC) and Nissan Stadium mass vaccination PODs which were highly successful in providing residents with COVID-19 vaccines.	Explore electronic health record solutions to eliminate the need for paper forms at mass POD events.
2.8.3 (a)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Include a mass POD plan annex in future pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.8.3 (b)	Strength: MPHD Vaccination POD Planning Teams	Core Capability: Planning PHEP Capability: Medical Countermeasure Dispensing and Administration	With limited guidance and in a short timeframe, planning teams from MPHD expertly developed detailed mass vaccination POD plans for Music City Center and Nissan Stadium.	Train and exercise mass POD operations.
2.9.1 (a)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Record Strike Team operating procedures in future pandemic planning.
2.9.1 (b)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Continue to utilize Strike Teams to reach vulnerable populations for future vaccination and community outreach efforts.
2.9.1 (c)	Strength: Strike Team operations and management	Core Capability: Public Health, Healthcare, and Emergency Medical Services PHEP Capability: Mass Care, Medical Countermeasure Dispensing and Administration	MPHD Strike Teams were key to providing sustained, compassionate care to the most vulnerable and underserved community members of Nashville and Davidson County and were integral to the success of MPHD's response and recovery efforts.	Strengthen community relationships developed during the pandemic response through community outreach events and planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.10.1 (a)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop a Memorandum of Agreement (MOA) with Metro ITS for liaison support in the RHOC upon activation.
2.10.1 (b)	Strength: Metro ITS liaison integration with MPHD	Core Capability: Operational Communications, Public Information and Warning PHEP Capability: Emergency Public Information and Warning, Information Sharing	Early in the response Metro ITS assigned an ITS liaison to MPHD, which greatly helped with assessing MPHD's technical needs.	Develop operating guides for the establishment of broadcasting and video conferencing capabilities.
2.11.1 (a)	Strength: MPHD Public Health Emergency Preparedness Logistics Operations	Core Capability: Supply Chain Integrity and Security, Planning PHEP Capability: Medical Material Management and Distribution, Foundation for Health Care and Medical Readiness	The MPHD Public Health Emergency Preparedness (PHEP) team expertly managed logistical operations throughout the pandemic.	To help monitor stock levels and expiration dates of shelf-life items, ensure that an accurate and up-to-date list of supplies is kept in the PHEP warehouse inventory control program.
2.12.1 (a)	Strength: Online Event Application Process	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a RedCap project for private event applications that streamlined the approval process for citywide event planners and organizers.	Capture the online event application process in pandemic planning efforts.

Reference	Strength	Core Capability, PHEP Capability(s)	Observation	Recommended Action(s)
2.12.2 (a)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Engage response partners, including MNPD, in pandemic planning and Director's Health Order enforcement efforts.
2.12.2 (b)	Strength: MPHD Director's Health Order enforcement efforts	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD Environmental Health organized a team to review and address daily complaints of health order violations at local businesses without the initial assistance of the Metro Nashville Police Department (MNPD).	Provide education and guidance to MNPD during Director's Health Order enforcement operations.
2.13.1 (a)	Strength: MPHD's ability to adapt to COVID-19 variants and continued commitment to serving the community	Core Capability: Operational Coordination PHEP Capability: Emergency Operations Coordination	With each surge of COVID-19 variants, MPHD remained committed to providing the community with increased access to masks, testing, vaccinations, vaccination boosters, and education services.	Continue to monitor COVID-19 variants and adjust MPHD's response operations as necessary.
2.15.1 (a)	Strength: Phased demobilization strategy	Core Capability: Operational Coordination, Planning PHEP Capability: Emergency Operations Coordination	MPHD developed a phased strategy for demobilization that was flexible and could be quickly ramped up if needed.	Capture demobilization and recovery procedures in pandemic planning efforts.

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Appendix B: After-Action Review Methods

The AAR/IP involved a multi-step process, moving from data collection through establishing the IP. The following overview notes the implementation of the approach.

Step 1: Data Collection

The AAR data collection process used a combination of online surveys, a review of departmental self-assessment documentation, teleconferences, one-on-one outreach, and meeting notes.

Survey Design

MPHD issued a voluntary survey to internal and external response stakeholders that supported MPHD's response to the COVID-19 pandemic. The following survey was issued to response partners on January 31, 2023, using an online survey tool. The survey remained open for 24 days, and 140 survey responses were recorded.

Survey Outline

The purpose of the survey was to gather data related to MPHD's COVID-19 preparedness, response, and recovery efforts. The information from this survey, coupled with interviews and a documentation review, informed this AAR for MPHD.

The questions related to the COVID-19 pandemic are as follows:

Section 1: Survey Respondent Information

- **Data Requested**
  - Name
  - Email
  - Title
  - Jurisdiction, Department, Agency, Organization, or Company Name
  - Please list your incident-specific position or role. If unknown, please describe the incident response or recovery actions you supported.

Section 2: Evaluation of Activities Specific to COVID-19

- **Case Investigation Operations**
  - Rate the ability of the MPHD to effectively investigate COVID-19 cases and provide support to quarantined and isolated individuals with available staffing. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to MPHD's overall Case Investigation operations and staffing concerns. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to MPHD's overall case investigation operations and staffing concerns. (open ended comment box)

- **Contact Tracing Program**

  - Rate the effectiveness of MPHD's COVID-19 contact tracing program and ability to identify barriers and challenges associated with contact tracing. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's overall management of an effective COVID-19 contact tracing program. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's overall management of an effective COVID-19 contact tracing program.

  - Rate MPHD's contact tracing program in the following area: supported the identification of health inequities or disparities (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's contact tracing program in the following area: supported connection to wraparound services (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's contact tracing program in the following area: how contact tracing data informed decisions regarding testing and vaccination efforts. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's contract tracing program's identification of health inequities or disparities. (open ended comment box)

- **Isolation and Quarantine**

  - Rate the effectiveness of MPHD's ability to provide education surrounding isolation and quarantine and identify barriers and challenges to isolation and quarantine. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's effectiveness of providing education surrounding isolation and quarantine and identifying barriers and challenges to isolation and quarantine. (open ended comment box)

- **TeleTask Texting System**

  - Rate the implementation, management, and maintenance of the TeleTask Texting System. (open ended comment box)

    - Describe any strengths or best practices you observed related to the TeleTask Texting System (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to the TeleTask Texting System (open ended comment box)

- **Data Reporting**

  - Rate MPHD's management of data reporting through the data dashboard. (did not observe, poor, below average, average, above average, excellent)

- Describe any strengths or best practices you observed related to MPHD's management of data reporting. (open ended comment box)

- Describe any areas for improvement or challenges you observed related to MPHD's management of data reporting. (open ended comment box)

- **NBS**
  - Rate the implementation, management, and maintenance of the National Electronic Disease Surveillance System (NEDSS) Base System (NBS) (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to the NBS. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to the NBS. (open ended comment box)

- **RedCap**
  - Rate the implementation, management, and maintenance of the RedCap project. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to the RedCap project. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to the RedCap project. (open ended comment box)

- **Translation Services**
  - Rate MPHD's overall support for verbal Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)
  - Rate MPHD's overall support for written Translation Services during the response and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)
    - Describe any areas for improvement or challenges you observed related to MPHD's overall support for either verbal or written Translation Services. (open ended comment box)

- **Language Line**
  - Rate the implementation of the Language Line. (did not observe, poor, below average, average, above average, excellent)
    - Describe any strengths or best practices you observed related to the Language Line. (open ended comment box)
    - Describe any areas for improvement and challenges you observed related to the Language Line. (open ended comment box)

- **Non-English Printed Materials**
  - Rate the quality and process for obtaining printed materials utilized for case interviews and COVID-19 information packets printed in Spanish, Arabic, and additional languages as well as printed materials obtained from special vendors. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any best practices you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to obtaining non-English printed materials during the response to and recovery from COVID-19. (open ended comment box)

- **Social Services and Human Needs**

  - Rate MPHD's referral to food access programs (to include the grocery delivery program) (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to housing programs. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to transportation services. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to health care and insurance programs. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to mental health services. (did not observe, poor, below average, average, above average, excellent)

  - Rate MPHD's referral to economic support services. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to social services and human needs. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to social services and human needs. (open ended comment box)

- **Thermometer Delivery Program**

  - Rate MPHD's overall implementation of the thermometer delivery program. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's implementation of the thermometer delivery program. (open ended comment box)

- **Support to Vulnerable and Diverse Populations**

  - Rate MPHD's overall support and services provided to vulnerable and diverse populations during COVID-19 response and recovery. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's overall support to vulnerable and diverse populations. (open ended comment box)

  - Rate MPHD's overall support to incarcerated individuals during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to services provided to incarcerated individuals during COVID-19 response and recovery operations. (open ended comment box)

- ■ Rate MPHD's overall support for and services provided to the transient and homeless population during the COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services for the transient and homeless in response and recovery from COVID-19. (open ended comment box)

- ■ Rate MPHD's overall support for and services provided to those in long term care facilities during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to services provided by MPHD for those in long term care facilities. (open ended comment box)

  - ◆ Describe any strengths or best practices you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed managing cluster outbreaks in long term care facilities. (open ended comment box)

- ■ Rate MPHD's outreach effort with Siloam and TN Immigrant and Refugee Rights Coalition (TIRRC). (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

  - ◆ Describe any areas for improvements or challenges you observed related to MPHD's outreach with Siloam and TN Immigrant & Refugee Rights Coalition (TIRRC). (open ended comment box)

- ● **Metro Nashville Public Schools**

  - ■ Rate MPHD's overall support to the Metro Nashville Public Schools (MNPS) in response to and recovery from COVID-19. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to the support provided to MNPS. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to the support provided to MNPS. (open ended comment box)

- **Hotline/Call Centers**

  - Rate the implementation and overall operations of MPHD's COVID-19 Hotline. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to Hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline staffing provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline IT support provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to hotline scripting provided by MPHD during the COVID-19 pandemic. (open ended comment box)

- **Testing**

  - Rate MPHD's implementation and maintenance of an effective COVID-19 testing program, including establishment of testing sites that serve under-resourced populations, such as those with limited transportation options, disabilities, or those living in remote or low-income areas. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's COVID-19 testing programs. (open ended comment box)

- **Assessment Centers – Kmart, Nissan, Meharry**

    - Describe any strengths or best practices you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Kmart Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Nissan Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any strengths or best practices you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvements or challenges you observed related to the Meharry Assessment Center during the COVID-19 pandemic. (open ended comment box)

- **Testing – Strike Team**

  - Rate the overall effectiveness of the MPHD's Strike Team Testing (STT) operations. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- Describe any areas for improvement or challenges you observed specific to Strike Team Testing (STT) during the COVID-19 pandemic. (open ended comment box)

- **Order Enforcement**

  - Rate the MPHD's overall implementation and maintenance of Order Enforcement during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any areas for improvement or challenges you observed specific MPHD's overall implementation and maintenance of Order Enforcement. (open ended comment box)

    - Describe any strengths or best practices you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's Health/Symptom Screening Operations. (open ended comment box)

    - Describe any MPHD strengths or best practices you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe any MPHD areas for improvement or challenges you observed related to the event application processes, including criteria for social distancing and attendance capping of large events. (open ended comment box)

    - Describe how well you feel MPHD complied with enforcing and implementing orders throughout the pandemic response. (open ended comment box)

- **Supply Chain/PPE**

  - Rate MPHD's ability to support the supply chain, including working with the private sector, and communicating any resource issues and challenges, including providing PPE to healthcare workers. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's supply chain monitoring and communication process specific to the COVID-19 pandemic. (open ended comment box)

  - Rate MPHD's management of medical equipment and PPE expiration date monitoring. (did not observe, poor, below average, average, above average, excellent)

    - Describe any strengths or best practices you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

    - Describe any areas for improvement or challenges you observed related to MPHD's management of medical equipment and PPE expiration date monitoring. (open ended comment box)

- **Strategic National Stockpile**

  - Describe any strengths or best practices you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

◆ Describe any areas for improvement or challenges you observed related to MPHD's coordination and utilization of the Strategic National Stockpile during the COVID-19 pandemic. (open ended comment box)

- **Mask Distribution**

  ▪ Rate MPHD's overall implementation and management of mask distribution during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of mask distribution during the COVID-19 pandemic. (open ended comment box)

  ▪ Rate MPHD's management of the initial mask distribution to health departments. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

    ◆ Describe any areas for improvement or challenges you observed related to MPHD's management of the initial mask distribution to health departments. (open ended comment box)

  ▪ Rate MPHD's support to sustained mask distribution efforts at community centers. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD sustained mask distribution efforts at community centers. (open ended comment box)

    ◆ Describe any areas for improvements or challenges you observed related to MPHD's sustained mask distribution efforts at community centers. (open ended comment box)

- **IT and Data Systems**

  ▪ Rate MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs during the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

    ◆ Describe any strengths or best practices you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    ◆ Describe any areas for improvements or challenges you observed related to MPHD's IT and data systems performance and flexibility to adapt to changing conditions and needs. (open ended comment box)

    ◆ Describe any strengths or best practices you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    ◆ Describe any areas for improvements or challenges you observed related to web-based data systems (e.g. NBS, Redcap) that were utilized during the COVID-19 pandemic. (open ended comment box)

    ◆ Describe any strengths or best practices you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to ordering, issuing, and inventorying IT equipment or data systems during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any strengths or best practices you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvements or challenges you observed related to setting up IT equipment or data systems provided during the COVID-19 pandemic. (open ended comment box)

- ▪ Rate MPHD's use of Redcap as the agency's COVID vaccine appointment system. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to MPHD's use of Redcap as the COVID vaccine appointment system. (open ended comment box)

- **Vaccination**

  - ▪ Rate MPHD's vaccination program efficacy in the following area: accessibility of vaccine sites. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: reaching the homebound. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: providing targeted, culturally and linguistically responsive public information. (did not observe, poor, below average, average, above average, excellent)

  - ▪ Rate MPHD's vaccination program efficacy in the following area: combating misinformation and vaccine hesitancy. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's implementation and management of an effective COVID-19 vaccination program. (open ended comment box)

- **Vaccination – CORE POD: COVID On-Site Response at East**

  - ▪ Rate MPHD's COVID Onsite Response at East (CORE) vaccination POD (initial vaccine site operated for approximately two months). (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's CORE vaccination POD. (open ended comment box)

    - ◆ Describe any challenges you observed related to MPHD's CORE vaccination POD. (open ended comment box)

- **Vaccination – Strike Teams**

  - ▪ Rate the effectiveness of MPHD's Strike Teams during vaccination operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to the use and deployment of MPHD's Strike Teams specifically regarding vaccination operations during the COVID-19 pandemic. (open ended comment box)

- **Vaccination – 75+ POD**

  - Rate MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Health Department's 75+ vaccination Pod at Lentz. (open ended comment box)

- **Vaccination – Music City Center**

  - Rate MPHD's support to Music City Center vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Music City Center vaccination Pod. (open ended comment box)

- **Vaccination – Nissan POD**

  - Rate MPHD's support to the Nissan vaccination POD. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's support to the Nissan vaccination Pod. (open ended comment box)

- **COVID-19 Variants**

  - Rate MPHD's ability to manage and adapt to new COVID-19 variants such as Delta and Omicron. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's ability to adapt to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's ability to adapted to new COVID-19 variants such as Delta or Omicron. (open ended comment box)

    - ◆ Describe how future challenges could be mitigated regarding new COVID-19 variants. (open ended comment box)

- **Charlotte Ave Assessment Center – August 2021 Case Surge**

  - Rate MPHD's implementation and management of the Charlotte Assessment Center during the August 2021 Case Surge. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- ◆ Describe any areas for improvement or challenges you observed related to the Charlotte Assessment Center operations during the August 2021 Case Surge. (open ended comment box)

- **Strike Team Operations**

  - ▪ Rate the overall operations including deployment, operations, staffing, equipping, and stand-down of MPHD's Strike Teams during the COVID-19 response. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to overall Strike Team operations during the COVID-19 pandemic. (open ended comment box)

  - ▪ Rate MPHD's Strike Teams' support to vulnerable populations (e.g. homebound, DIDD, LTC, individuals experiencing homelessness, incarcerated individuals, immigrant and refugee population, people of color). (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

    - ◆ Describe any areas for improvements or challenges you observed related to MPHD's Strike Teams' support to vulnerable populations throughout the pandemic response. (open ended comment box)

- **Health Equity**

  - ▪ Rate MPHD's ability to promote health equity during COVID-19 response and recovery operations. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

    - ◆ Describe any areas for improvement you observed related MPHD's ability to promote health equity during the COVID-19 response and recovery operations. (open ended comment box)

- **Finance**

  - ▪ Rate MPHD's tracking of spending and awareness of all available funding mechanisms to support effective disaster cost recovery. (did not observe, poor, below average, average, above average, excellent)

    - ◆ Describe any strengths or best practices you observed related to MPHD's cost recovery program. (open ended comment box)

    - ◆ Describe any areas for improvement or challenges you observed related to MPHD's cost recovery program. (open ended comment box)

- **Recovery and Demobilization**

  - ▪ Rate MPHD's recovery and demobilization operations. (did not observe, poor, below average, average, above average, excellent)

- ◆ Describe any strengths or best practices you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- ◆ Describe any areas for improvements or challenges you observed related to MPHD's recovery and demobilization operations. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

Section 3: Notable Event During the Pandemic Response

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the March 2020 EF3 Tornado. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operations during the summer of 2020 protests. (open ended comment box)

- ◆ Describe any strengths or challenges you observed related to MPHD's management of COVID-19 response operation during the Christmas Day 2020 bombing in downtown Nashville. (open ended comment box)

- ▪ Rate MPHD's overall response performance related to the COVID-19 pandemic. (did not observe, poor, below average, average, above average, excellent)

  - ◆ Describe any strengths or best practices you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - ◆ Describe any areas for improvement or challenges you observed related to MPHD's overall response to the COVID-19 pandemic. (open ended comment box)

  - ◆ Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts. (open ended comment box)

  - ◆ List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts. (open ended comment box)

  - ◆ Additional comments. (open ended comment box)

Step 2: Interviews

Based on a list provided by MPHD Public Health Emergency Preparedness (PHEP), critical response staff were given an opportunity to participate in an interview to discuss the overall response, strengths, and areas of improvement. Of the 31 individuals invited to attend, 20 participated in interviews.

Table 4: Participants in Interviews

Interview Representation	#
MPHD	15
Metro Government	4
Response Partners	1
Total	20

The interview questions related to the COVID-19 pandemic were as follows:

- Name:

- Agency:

- In what role(s) did you serve during the COVID-19 Pandemic response?

- Thinking about the entire span of the response (March 2020–December 2022). What processes/systems/tools/plans did your agency implement that you believe improved the response? (e.g., trainings, processes, EOPs, SNS plans, etc.)

- Thinking back to March 2020, what do you wish you knew then that you know now that might cause you to take a different course of action?

- Based on your role and observations, what are three things you believe MPHD did well during the response to COVID-19?

- Based on your role and observations, what are three things you believe MPHD needs to improve for future large-scale responses like COVID-19?

- How would you describe MPHD's ability to provide clear communication and guidance to staff? What could have been improved with the communication provided?

- Describe your experience with the Case Management Leadership Team.

- Describe your role and experiences with the Isolation & Quarantine team. Do you feel that isolation and quarantine guidance was managed effectively?

- Describe your role and experiences with the testing and vaccination processes. Do you feel MPHD managed testing and vaccination programs effectively? Can you highlight any strengths or areas for improvement in this area?

- Describe any training requirements you feel may assist in improving future catastrophic disaster response and recovery efforts.

- List any resource requirements (personnel or equipment) your department, agency, or organization may need to improve future response and recovery efforts.

- Additional Comments:

Step 3: Data Analysis

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Survey Response Summary

- The Nashville Metro Public Health Department COVID-19 AAR survey received 140 responses.

Table 5: Overview of Survey Respondents

Representation	#
MPHD Partners	124
Metro Government Partners	3
Community Response Partners	13
Total	140

Survey outputs and interview notes were analyzed and sorted by topic area and similar comments and outputs were consolidated.

Findings from the data collection process were analyzed to identify primary strengths and areas for improvement, which were used to group key observations and document corresponding core capabilities under each priority focus area.

Step 4: Establishing the Improvement Plan

Key observations and associated recommended actions were presented in the AAR and the appended IP. In addition, the IP prioritizes areas for improvement, indicates the agency or organization assigned to lead response to each identified sustainment opportunity and area for improvement, and establishes a timeline for completing associated actions (i.e., start and completion dates). MPHD Public Health Emergency Preparedness (PHEP) will meet with key stakeholders internally to review the IP and assign responsibilities and timelines for implementation.

Step 5: Implementing the Improvement Plan

The IP remains a living tool to help guide the process of addressing areas for improvement and will be used at follow-up meetings to check the status of outstanding areas for improvement and corresponding activities. MPHD PHEP will continue to guide the improvement process, but responsible agencies and organizations will lead the responses to their assigned areas for improvement. MPHD PHEP will establish an accountability process, including meetings as needed to assess progress with appropriate stakeholders.

Appendix C: Partner Agencies

Traditional and non-traditional partnerships formed and strengthened were critical to the success of response and recovery efforts. MPHD partnered with the agencies in Table 6 thorough the response to and recovery from COVID-19.

Table 6: Partner Agencies

Aegis Lab	Music City Center
AEL Lab	Music City Tents
Ascension Health Systems	Nashville Convention and Visitors Corp
Axios	Nashville Fairgrounds
Belmont University School of Nursing	Nashville Fire Department
Belmont University School of Pharmacy	Nashville Predators
Boswell's Golf Carts	Nashville Red Cross
Bridges for Deaf and Hard of Hearing	Nashville Rescue Mission
Bridgestone Arena	National Pan-Hellenic Council of Nashville
Conexion and Casa Azafran	Neighborhood of Health
Congregational Health & Education Network	Office of Emergency Management
Davidson County Sheriff's Office	PathGroup Lab
DVL Seigenthaler	Plaza Mariachi
El Jefe 96.7	Randstad
English Learners Office/Metro Public Schools	Room in the Inn
Exit In	Salvation Army
FEMA Region IV	Siloam
FiftyForward	St. Thomas EMS
Greater St. James Missionary Baptist Church, 28th Avenue	Tennessean
Hands On Nashville	TN Department of Intellectual Developmental Disabilities
HCA	TN Department of Health
hubNashville	TN Emergency Management Agency
Islamic Center of TN	TN Hospital Association
Lee Chapel African Methodist Episcopal Church	TN Immigrant and Refugee Rights Coalition
Maxim	TN Lookout
Mayor's Office	TN National Guard
Metropolitan Development & Housing Agency	TN Titans
Meharry Medical College	The Contributor
Metro Beer Board	Trako Dental & Medical Supply
Metro Finance	United Rentals
Metro General Hospital	US Marshall's Office
Metro General Services	US Forestry Service
Metro ITS	Vanderbilt University Medical Center
Metro Legal	Vanderbilt University School of Nursing
Metro Nashville Airport Authority	WeGo
Metro Nashville Community Centers	Wellpath
Metro Nashville Network	WFSK Radio
Metro Nashville Public Schools	WKRN
Metro Parks	WPLN
Metro Police Dept	WSMV
Metro Public Works	WTVF
Metro Schools Fleet	WZTV
Metro Social Services	

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Appendix D: Incident Timeline

2020 Timeline

- **January 9:** The World Health Organization (WHO) traces Wuhan pneumonia illness to a new coronavirus.[i]

- **January 16:** Tennessee State Health Operations Center is activated due to the rise of COVID-19.[ii]

- **January 17:** The Centers for Disease Control (CDC) and Department of Homeland Security's Customs and Border Protection (CBP) announce public health screenings to be set up at three U.S. airports.[iii]

- **January 30**: The WHO declares the novel coronavirus disease (now designated as COVID-19) a public health emergency of international concern. [iv]

- **January 31**: The Secretary of the U.S. Department of Health and Human Services (DHHS) declares a public health emergency in response to COVID-19.[v]

- **February 11:** The WHO officially announces a name for this new disease as "COVID-19".[vi]

- **February 26:** The CDC confirms possible instance of community spread of COVID-19 in the U.S.[vii]

- **February 27:** MPHD established ICS and activated the RHOC.[viii]

- **February 27:** MPHD has established Incident Command to coordinate response planning for COVID-19 cases in Davidson County.[ix]

- **March 3:** A deadly tornado outbreak affected middle Tennessee on the night of March 2 and continued through the morning of March 3, 2020. A massive EF3 tornado hit and impacted Nashville, leaving 25 people dead. It was the 6th costliest tornado in United States history.

- **March 11**: The WHO declares COVID-19 a pandemic.[x]

- **March 12:** Governor Bill Lee declared state of emergence for Tennessee.

- **March 13**: U.S. President Donald J. Trump declares a national emergency in response to the COVID-19 outbreak.[xi]

- **March 13:** Gov. Bill Lee issues guidance for mass gatherings, schools, state employees, and the State Capitol Building.[xii]

- **March 15:** States in the U.S. begin to announce shutdowns to reduce the spread of COVID-19. Notable examples include New York's public-school system and Ohio's restaurants and bars.[xiii]

- **March 15:** The Metropolitan Board of Health of Nashville and Davidson County declares a public health emergency.[xiv]

- **March 16:** Mayor John Cooper announces the closure of bars and restaurants in Davidson county to slow the spread of COVID-19.[xv]

- **March 17:** The first human trial for a vaccine against COVID-19 begins in the U.S.[xvi]

- **March 17:** Gov. Lee urges all Tennessee school districts to close by March 20 and remain closed until March 31.

- **March 18:** Mayor John Cooper issued state of emergency for Metropolitan Nashville and Davidson County.

- **March 20:** MPHD sets up a COVID-19 Information Hotline.[xvii]

- **March 22:** Gov. Bill Lee signs executive order that mandates alterative business models for restaurants and gyms and visiting limitations for nursing homes, retirement homes, and long-term care facilities.[xviii]

- **March 23:** Gov. Bill Lee establishes a Unified-Command Group for COVID-19 to streamline coordination between TEMA, TDH, and TDM.[xix]

- **March 27**: President Trump and Congress approve a $2.2 trillion Coronavirus Aid, Relief, and Economic Security Act (CARES) aid package to assist individuals and companies with COVID-19 impacts.[xx]

- **March 30:** Safer at Home executive order is issued and will remain in effect until April 14.[xxi]

- **March 30:** Nissan and Meharry Assessment center opens.[xxii]

- **April 1:** The Kmart assessment center opens.[xxiii]

- **April 2:** The WHO reports evidence of transmission from symptomatic and asymptomatic people infected with COVID-19.[xxiv]

- **April 2:** Gov. Bill Lee issues Executive Order 23 requiring the people of Tennessee to stay at home except for essential activities.[xxv]

- **April 3:** The CDC issues guidance that recommends people wear a mask outside of their home.[xxvi]

- **April 20:** Gov. Bill Lee announces that Tennessee's stay at home order will end on April 30 and that businesses may reopen on May 1.[xxvii]

- **April 20:** Shelters open at the fairgrounds and is being staffed by Metro Social Services and St. Thomas EMS.

- **April 30:** President Trump launches Operation Warp Speed, an initiative to produce a vaccine for the coronavirus as quick as possible with CDC as an integral member.[xxviii]

- **May 4:** Case monitoring and isolation guidance is changing per CDC and TDH guidance. Cases will need to be monitored for a minimum of 10 days and must be symptom free for three consecutive days without the help of medication.[xxix]

- **May 7:** Metro Public Health clinics will begin screening patients' temps as they enter the clinics.

- **May 9:** The U.S. unemployment reaches 14.7%, the highest since the great depression.[xxx]

- **May 21:** MPHD Long-term care mass testing has been given to the regions and metros. Testing has been scheduled. There are approx. 51-52 sites that will undergo testing by MPHD staff.[xxxi]

- **May 25:** Phase 2 of the city reopening commences.[xxxii]

- **May 28:** TDH selects Davidson County's alternate care site at the General Hospital following a passed inspection.[xxxiii]

- **June 28:** The Metro Board of Health passed a motion requiring face masks to be worn in public.[xxxiv]

- **July 7:** The National Guard will be helping with testing at the assessment centers for the month of July.

- **August 4:** MPHD has ceased the drive-thru mask distribution at Lentz and has partnered with Metro Parks community centers to set up 11 mask distribution sites across Nashville. [xxxv]

- **September 16:** The Trump Administration releases a vaccine distribution plan to make the vaccine available and free for all Americans by January 2021.[xxxvi]

- **December 2:** Quarantine can end after Day 14 without testing and if no symptoms appear. This is what MPHD, TDH, and CDC recommend, and it is the option with the least risk of disease transmission. [xxxvii]

- **December 8:** The first allocation of COVID vaccines will go directly to hospitals for Tier 1a1 individuals. Preparations for distribution commence at an East Nashville site.[xxxviii]

- **December 11:** The Food and Drug Administration (FDA) issues an Emergency Use Authorization (EUA) for the Pfizer-BioNTech COVID-19 vaccine.[xxxix]

- **December 18:** The FDA issues an EUA for the Moderna COVID-19 vaccine.[xl]

- **December 23:** MPHD opens first vaccine clinic at the CORE site.[xli]

- **December 25:** A recreational vehicle detonated in downtown Nashville, Tennessee, United States, killing the bomber, injuring eight people and damaging several of buildings in the area.[xlii]

- **December 31:** The WHO issues its first emergency use validation for a COVID-19 vaccine and emphasizes need for equitable global access.[xliii]

2021 Timeline

- **January 4:** The Strike Team begins vaccine operations.[xliv]

- **January 5:** The Federal Emergency Management Agency (FEMA) modifies Allocation Order on exports such as personal protective equipment, scare health resources, and medical resources to ensure that these resources are widely available to the American public.[xlv]

- **January 5:** MPHD sets up 2 vaccination sites for tier 1 groups. The sites are the HCA building and the CORE site.[xlvi]

- **January 7:** The CDC releases the Comprehensive COVID-19 Quarantine vs Isolation guide that provides a detailed understanding for the procedures of isolation and quarantine for vaccinated and unvaccinated.[xlvii]

- **January 9:** MPHD operates a vaccination clinic for people ages 75 and older at the Lentz Centennial Rooms. [xlviii]

- **January 16:** Recover clinic opens.[xlix]

- **January 29:** The CDC issues an order requiring the wearing of masks by people on public transportation conveyances or on the premises of transportation hubs to prevent spread of the virus that causes COVID-19.[l]

- **January 30:** CORE site closes and the Music City Center opens.[li]

- **February 1:** The DHS releases a statement supporting equal access to COVID-19 vaccines and vaccine distribution sites.[lii]

- **February 2**: The CDC issues an order requiring that masks be worn on planes, buses, trains, and other forms of public transportation traveling into, within, or out of the United States and in U.S. transportation hubs, such as airports and bus stations.[liii]

- **February 18:** MPHD partners with the Nashville Rescue Mission to host the first homeless shelter vaccine event[liv]

- **February 26:** FEMA announces federal support to community vaccination clinics nationwide, putting $3.97 billion to vaccination efforts.[lv]

- **March 3:** MPHD partners with WeGo. WeGo can provide transportation of patients to and from vaccination sites.[lvi]

- **March 9:** FEMA establishes the Civil Rights Advisory Group to review policies, plans, practices, and strategies to ensure that vaccine access can be widely accessible to all. [lvii]

- **March 20:** "MPHD opens a one-day drive thru pod to vaccinate people from 6:00 AM to 8:00 PM.

- **April 20:** All person's age 16+ may now receive vaccinations. 37.8% of Davidson County residents have a first does and 23% are fully vaccinated. MPHD strike team begins to allow more walk-ins at events and moving away from registration.[lviii]

- **May 4:** MPHD starts an initiative to attend public events with popup vaccination sites to make the vaccine more accessible.[lix]

- **May 13:** The CDC announces that people who are fully vaccinated against Covid-19 no longer need to wear masks or physically distance—whether indoors or outdoors in most circumstances.[lx]

- **May 18:** MPHD sets up the Homebound Vaccination team.[lxi]

- **May 28:** Music City Center closes.[lxii]

- **June 25:** Recover closes.[lxiii]

- **July 16:** Nissan center closes.[lxiv]

- **September 7:** HCA assessment center opens.[lxv]

- **November 2:** The CDC releases recommendations for COVID-19 vaccines for children 5 to 11 Years.[lxvi]

- **November 19:** The CDC expands eligibility for COVID-19 booster shots to all adults.[lxvii]

- **November 19**: The COVID-19 emergency declaration ended in Tennessee on November 19, 2021, when Governor Bill Lee announced that he will not renew the COVID-19 state of emergency.[lxviii]

- **November 26:** The WHO announces the classification of Omicron (B.1.1.529) as a variant of concern.[lxix]

- **December 1:** The CDC announces that the first confirmed case of the Omicron variant was detected in the U.S.[lxx]

- **December 2:** The CDC announces new testing requirements for international travel to the U.S. to include a negative test 24 hours prior to departure.[lxxi]

- **December 6:** The CDC updates the international travel order to require air passengers from a foreign country show a negative COVID-19 viral test result taken no more than 1 day before travel, or documentation of having recovered from COVID-19 in the past 90 days, before they board their flight.[lxxii]

- **December 22:** The FDA issues an EUA for Pfizer's Paxlovid for the treatment of mild-to-moderate COVID-19 in adults and pediatric patients, 12 years of age and older. [lxxiii]

- **December 27:** The CDC announces revised isolation and quarantine requirements for the general public.[lxxiv]

2022 Timeline

- **January 4:** The CDC recommends the Pfizer booster for children at 5 Months after vaccine and additional primary dose for certain immunocompromised children.[lxxv]

- **January 5:** The CDC expands booster shot eligibility and strengthens recommendations for 12-17-year-olds.[lxxvi]

- **January 6:** The CDC releases public health guidance for potential COVID-19 exposure associated with travel.[lxxvii]

- **January 12:** The Biden Administration announces they will make available 10 million tests per month for schools to ensure they remain safely open.[lxxviii]

- **January 14:** The Biden administration announces a new plan for distributing free at-home COVID-19 rapid tests to the American people.[lxxix]

- **January 14:** The WHO recommends two new drugs to treat COVID-19.[lxxx]

- **January 21:** The CDC updates its guidance to protect healthcare personnel, patients, and visitors due to the new Omicron variant.[lxxxi]

- **March 10:** At CDC's recommendation, TSA will extend the security directive for mask use on public transportation and transportation hubs for one month, through April 18th.[lxxxii]

- **April 19:** CDC launches new center for forecasting and outbreak analytics.[lxxxiii]

- **April 29:** HCA assessment center closes.[lxxxiv]

- **June 30:** Kmart assessment center closes.[lxxxv]

- **July 1:** MPHD creates full time non-contracted COVID Response Coordinator position[lxxxvi].

- **December 9:** CDC Expands Updated COVID-19 Vaccines to Include Children Ages 6 Months through 5 Years.[lxxxvii]

- **December 31:** Strike Team operations demobilize.[lxxxviii]

2023 Timeline

- **March 30:** Senate votes to end Covid-19 emergency, COVID-19 emergency declaration to end on May 11, 2023.[lxxxix]

- **May 11:** COVID declaration officially ends.

- **June 30:** MPHD completes COVID-19 AAR[xc].

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