

AFTER-ACTION REPORT

OSU-COVID-19-OADDL



**OKLAHOMA STATE
UNIVERSITY**

COVID-19 RESPONSE TEAM

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FOREWORD

If we have learned anything since the onset of the coronavirus pandemic, it is that a pandemic—and our attempt to respond to it—is **not an incident**. Rather, a pandemic sets in motion a litany of stressors, hidden dangers, and catastrophic potentialities...each of which has unclear onset dates and unpredictable durations. So “planning” in the way we normally use that term, simply goes out the window.

All that said, when we decided to stand up a COVID-19 diagnostic laboratory at OSU to contribute to Oklahoma’s testing capacity, the logistical coordination that was needed prompted us to treat the situation as analogous to managing a disaster scene. Hence the birth of the Incident Management Team in support of our efforts. Despite the fact that this situation was not like any post-tornado, post-hurricane, post-bombing, or post-(name-your-disaster) situation anyone on the team had ever worked, this amazing group of people applied their knowledge and skill, adapted their toolkits with speed and agility, and developed new skills and tools de novo, all in pursuit of a mission that was still being defined even as they operated. It was like building a ship at sea...during a storm! But it worked. Not because the IMT closely followed their rule book (there wasn’t one). And not because they obeyed my instructions or those of the other leaders involved (we were riding the same uncertain wave). But because they truly came together as a team, and they found ways to do what seemed impossible. For example, going from zero to supporting a certified and functioning diagnostic lab in 13 days, then transitioning it to a sustainable operation only weeks later. I could not imagine OSU stepping up our COVID-19 diagnostic capability without the Incident Management Team.

And I could not imagine our Incident Management Team without the leadership of Ed Kirtley. There is much to learn from their actions described in this report. My solemn wish is that we never need to do something like this again. But if we do, we now have an impressive model for which I am sincerely grateful.



Kenneth Sewell
OSU Vice President for Research

SUMMARY OF RECOMMENDATIONS

The recommendations based on the challenges identified from the After-Action review of Oklahoma State University’s COVID-19 response (OSU-COVID-19-OADDL) are listed in Table 1. These four recommendations stem from an extensive review process which highlighted the main challenges and lessons learned, providing several opportunities for immediate improvement. Implementing the recommendations will contribute to the ongoing preparedness efforts of Oklahoma State University and the Emergency Operations Center (EOC) to prevent, protect, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk to the university.

RECOMMENDATIONS	Challenges	Page
1. Identify and develop a cadre of trained OSU volunteers (students, faculty, and staff) and formalize the IMT to support future operations, provide long-term stability and positive progression.	1-8	36
2. Train, exercise and evaluate the OSU response plans and IMT capabilities regularly in conjunction with the EOC.	9-22	36
3. Upgrade workstations and modernize the information and communications technology available in the EOC.	23 and 24	36
4. Enhance senior OSU leadership’s knowledge of the need for and benefits of the IMT and OSU EOC for both emergency and non-emergent events.	25	37

Table 1: Recommendations based on the 25 challenges identified from the After-Action review of Oklahoma State University’s COVID-19 response

INTRODUCTION

This report provides a review of the Incident Management Team's (IMT) operations to support human sample testing for COVID-19 that took place from March 19, 2020 through the demobilization of the IMT on April 27, 2020. An After Action Report (AAR) is a qualitative and quantitative review of actions taken in response to a critical event that provides a means of identifying and documenting the accomplishments, challenges and lessons learned. The value of this AAR is its focus on collective learning and shared experiences, with emphasis on the knowledge from all the stakeholders involved. It forms a key aspect of the organization's internal system of learning and quality improvement, which strengthens organizational resilience to future crises. The AAR also provides a snapshot of the type of outstanding work that a dedicated team under experienced leadership can achieve.

The main purpose of this AAR is to identify the post event actions that need to be addressed immediately to ensure that the organization is better prepared for future events. This AAR is not intended to assess individual performance or competence, but rather to identify functional challenges that must be addressed and best practices that need to be maintained. Thus, the scope of this AAR is limited to the following key areas, which will enable improvement actions for the next event:

- 1) A structured review of the IMT's response activities.
- 2) An analysis of the what, why and how of the operation.
- 3) Identification of what needs to be addressed immediately.
- 4) Identification of what should be done in the longer term.

The overall goal of the AAR is to build upon the successes and lessons learned from the experience, to reflect on what worked, and identify where changes could improve the work of future IMT's involved in similar operations. Sharing the AAR results will help future IMT's learn from the successful strategies implemented and avoid the pitfalls that the team has already worked to overcome.

Background to the AAR

Several after-action debriefs and review meetings were conducted immediately following the demobilization of the IMT with the aim of collecting and assessing general and specific data related to OSU's COVID-19 response operation (OSU-COVID-19-OADDL). In order to establish a standardized method for the collection of key assessment data associated with the COVID-19 response, a debriefing protocol was developed. A debriefing form was provided to selected IMT personnel who were directly involved in the COVID-19 response to complete in conjunction with their team. In addition, information was extracted from numerous status reports, action plans, media releases and other documentation that was created during the operation. IMT members who had a key role in the initial response and operations provided direct input into the AAR or were interviewed to provide more specific information or documentation for compiling the report. In addition, to evaluate the OSU EOC facility, operational systems, support and a Qualtrics online survey that included questions relating to the EOC, was disseminated to all personnel who operated in the EOC (see appendix A).

Structure of the Report

The report is designed to communicate operations and achievements, document challenges and operational/organizational issues, recognize contributions and provide a framework for future IMT operations.

The sections that follow, describe OSU's IMT response and include the major findings associated with the response operations. Section I provides the Operation Overview, which describes the need for the IMT, the mission and goals and identifies the participating agencies and organizations. Section II details the IMT organizational structure and staff involved in the operation and describes their specific roles and responsibilities within the organizational structure. Section III describes the key operational actions and activities in chronological order. Sections IV, V and VI focus on IMT feedback, which includes the key accomplishments, challenges and lessons learned respectively. Section VII provides several recommendations based on the analysis of the findings that emanate from information obtained from: 1) returns of the initial AAR survey, 2) subsequent direct engagements with key personnel, and 3) analysis of IMT operations documentation from the OSU COVID-19 Response SharePoint network drive. The AAR concludes with Section VIII, which recognizes the individuals and organizations that contributed to the overall success of the OSU COVID-19 IMT OADDL response mission.

"Based on everything I've been able to read; I think it's safe to say no one has done it more quickly or better than we have. And that's because of the attitude of this campus from the leadership down. Everyone was on board."

Shannon Rigsby, Public Information Officer

SECTION I: OPERATION OVERVIEW

Background

On March 13, 2020 the Federal Emergency Management Agency (FEMA) issued a nationwide Emergency Declaration in response to the ongoing COVID-19 pandemic. On March 15, 2020 the Governor of the State of Oklahoma, John Kevin Stitt, issued an executive order (2020-07) activating the State Emergency Operations plan. This required State departments, agencies and resources to be available to respond to the COVID-19 pandemic to protect the health and safety of the public.

Through an amendment filed on March 21, 2020, and at the request of the Governor, OSU was asked to adapt its capabilities to test the increasing number of samples (nasopharyngeal swabs) for SARS-CoV-2 (COVID-19) that were being taken by health care professionals across the state. A unique partnership between the OSU Division of the Vice President for Research, OSU Medicine, the OSU College of Veterinary Medicine and the OSU Diagnostic Laboratory (ODL) was developed and operated within the existing Oklahoma Animal Disease Diagnostic Laboratory (OADDL) in Stillwater. Key to this launch was utilizing the existing expertise of a Clinical Laboratory Improvement Amendment (CLIA) certified lab director, which allowed for authorization of CLIA certification for human diagnostic testing within the OADDL building.

To support and facilitate the ramping up of operations, Dr. Kenneth Sewell, Vice President for Research, officially appointed Ed Kirtley, Assistant Dean of Engineering Extension, within the College of Engineering, Architecture and Technology (CEAT), to lead the initiative. With a background in fire and emergency management, Ed Kirtley immediately assembled and activated an Incident Management Team using the principles of the Incident Command System to ensure the mission's success.

On April 5, 2020 an official National Disaster Declaration was issued by FEMA for the whole of the state of Oklahoma as shown in Figure 1. This allowed for the provision of federal emergency aid related to the COVID-19 pandemic.

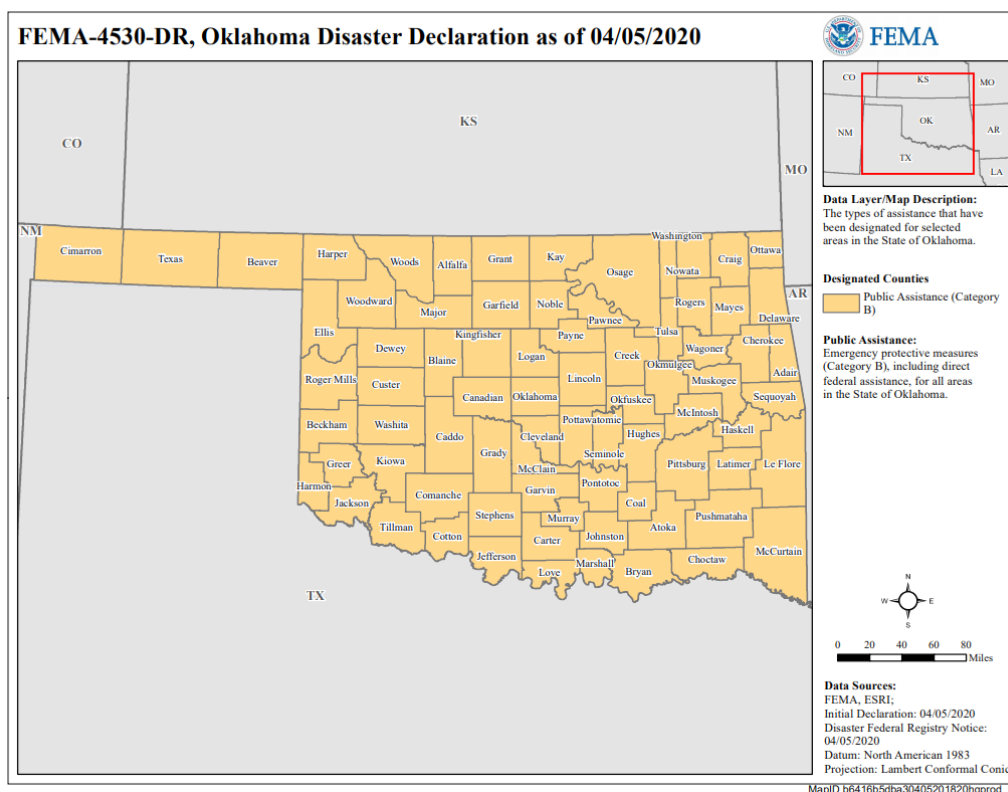


Figure 1: FEMA Disaster Declaration that identifies the additional needs for Oklahoma under the nationwide emergency declaration for COVID-19. (Source: <https://www.fema.gov/disasters>)

The Incident Management Team (IMT)

Staff, faculty and students from across OSU came together to help ensure the success of the Governor's request to ramp up OSU's human sample testing capability. The IMT was quickly established and consisted of representatives from numerous colleges and departments from the OSU Stillwater campus. An IMT is a comprehensive resource (a team) that enhances ongoing operations through provision of logistical and fiscal planning, and operational and safety support. The IMT's mission was to establish and facilitate immediate logistical support for the ODL operation and develop support systems to enable long-term sustained operations. IMT support allowed the OSU Diagnostic Laboratory personnel to focus their full attention on the testing of swabs, collected by medical workers throughout the state, for COVID-19.

Mission and Goals of the IMT

On March 19, 2020, the IMT was assigned three overarching goals, which defined its operational scope:

1. Obtain, organize, and coordinate logistical resources to support the initial human sample testing operations at ODL.
2. Establish and operate logistical support processes and the systems necessary for the sustained human sample testing operation of ODL.
3. Establish the financial and administrative processes necessary for successful cost recovery from the state and federal government.

The overall mission goals were accomplished within 39 days. On Monday, April 27, 2020 the IMT was formally demobilized.

Participating Agencies and Departments

Various state agencies and OSU departments and colleges were involved in the operation. In alphabetical order these included:

Internal:

- College of Arts and Sciences, Air Force ROTC Detachment 670
- College of Education and Human Sciences (CEHS)
- College of Engineering, Architecture and Technology (CEAT)
- College of Veterinary Medicine (Vet Med)
- Edmon Low Library
- Oklahoma Animal Disease Diagnostic Laboratory (OADDL)
- OSU Department of Brand Management
- OSU Department of Public Safety (OSUPD)
- OSU Emergency Operations Center (EOC)
- OSU Environmental Health and Safety (EHS)
- OSU Housing and Residential Life
- OSU Medicine
- OSU Motor Pool

- OSU Research, Division of the Vice President for Research
- OSU Transit Services
- University Health Services (UHS)
- University Mailing Services

External:

- Office of the Governor of Oklahoma
- Oklahoma Department of Human Services (DHS)
- Oklahoma National Guard (OKNG)
- Oklahoma State Department of Health (OSDH)

Summary of Key Events

The following summary provides a list of key events that occurred prior to and during the IMT operation.

Oklahoma COVID-19 Pandemic	
Presidential (Federal) Major Disaster Declaration: April 05, 2020 (DR-4530)	
Emergency Declaration: March 13, 2020 (EM-3462)	
State Emergency Operations Plan Activated: March 15, 2020 (Executive order 2020-07)	
Incident Period: January 20, 2020 - ongoing	
OSU IMT Activation: March 19, 2020 (OSU-COVID-19-OADDL)	
Incident Description: Establish immediate logistical support for the ODL operation, and develop support systems for long-term sustainability.	
IMT Incident Period: March 19 to April 27, 2020	
IMT Operation Chronology:	
19 March	IMT activated by OSU Vice-President for Research Kenneth Sewell
24 March	Initial Meeting of IMT Command and general staff
26 March	OSU EOC officially activated by Captain Dan Ray to support the IMT
27 March	IMT organizational structure expanded
31 March	On boarding of support personnel begins
31 March	Samples received from care providers
3 April	Data entry support initiated
3 April	Collection and staffing branches established
6 April	Collections from health department begins
8 April	IMT expanded to support the Continuum of Care response
9 April	Transportation of samples to Lubbock, Texas begins
20 April	Sample collection transferred to Oklahoma National Guard
23 April	Demobilization plan approved
27 April	IMT deactivated at 08:00

Table 2: Summary of key events

The diagram in Figure 2 illustrates the period that the IMT was operational in relation to the sustained operations at the ODL and the ongoing operational readiness activities of the OSU EOC. The immediate activation and integration between the IMT, EOC and ODL were essential for this mission’s success.

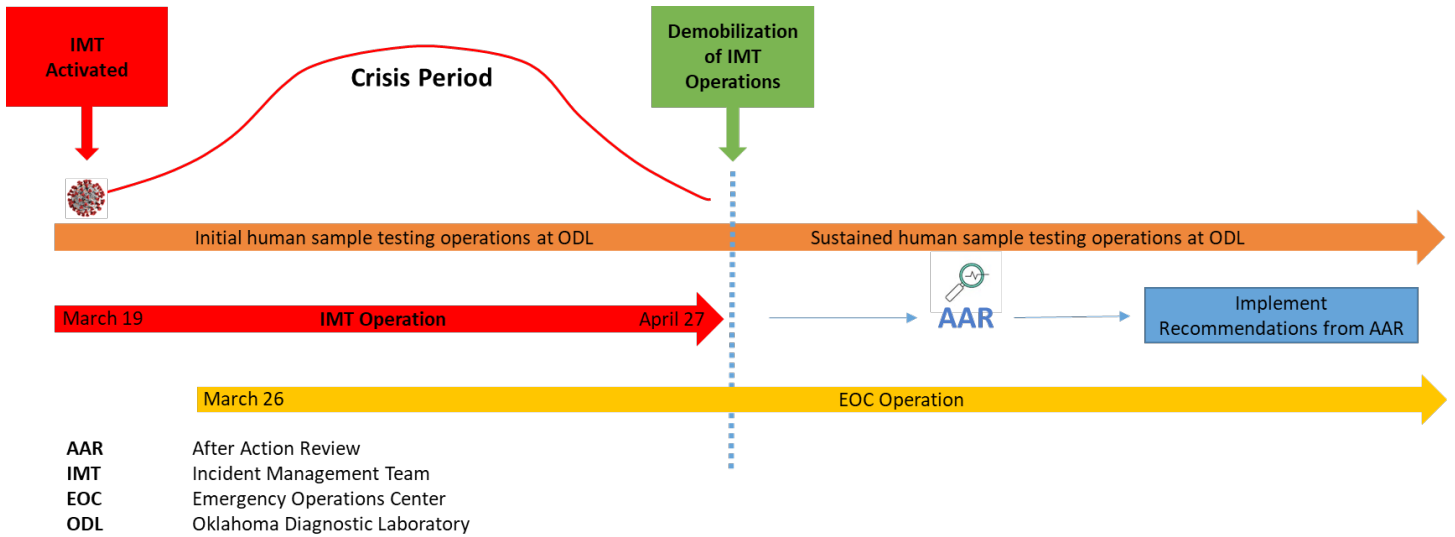


Figure 2: Timeline of IMT operation in relation to sustained activities at ODL and ongoing readiness activities at the OSU EOC.

“Oklahoma State University has done incredible work to quickly find innovative ways to help our state significantly increase its COVID-19 testing capacity.”

Governor Kevin Stitt

SECTION II: STAFF & STRUCTURE

The Incident Management Team

As the ODL operation became more complex and costly, the need for an organizational manager for logistical and operational support became more evident. On March 19, 2020, Ed Kirtley was provided with the full authority to perform this function by Dr. Kenneth Sewell, Vice President for Research.

The personnel involved in the operation consisted of staff, faculty and students from units within several departments at OSU. Personnel from the following schools and departments served within the IMT:

- College of Arts and Sciences, Air Force ROTC Detachment 670
- College of Education and Human Sciences (CEHS)
- College of Engineering, Architecture and Technology (CEAT)
- College of Veterinary Medicine (Vet Med)
- Edmon Low Library
- Oklahoma Animal Disease Diagnostic Laboratory (OADDL)
- OSU Department of Brand Management
- OSU Department of Public Safety (OSUPD)
- OSU Emergency Operations Center (EOC)
- OSU Environmental Health and Safety (EHS)
- OSU Housing and Residential Life
- OSU Motor Pool
- OSU Research, Division of the Vice President for Research
- OSU Transit Services
- University Health Services (UHS)

IMT participation was voluntary for most: each participant was advised of and required to acknowledge the potential risks of participation. Appendix B provides a comprehensive list of all personnel that served in the IMT and includes their home department and designation within the IMT organizational structure.

The Incident Command System

The Incident Command System (ICS), used for this operation, was designed to enable the rapid and efficient management required for large, complex and evolving situations. The specific benefits within this operation were that it allowed personnel from a variety of agencies to quickly blend into a common management structure, provided logistical and administrative support to ensure that the lab staff and technicians could meet their objectives and facilitated cost effectiveness by minimizing the duplication of effort.

The organizational structure included command and general staff positions based on the ICS pre-designated roles and responsibilities. In the ICS there is no correlation between the IMT organization and the administrative structure of a member's home departments or agencies. The organizational structure for the ODL operation consisted of five functional areas: Command, Operations, Planning, Logistics, and Administration/Finance. Within ICS, and especially during larger incidents, the Incident Commander manages the organization and not the incident.

IMT Organizational Structure

The IMT consisted of Ed Kirtley, Assistant Dean of Engineering Extension in the College of Engineering, Architecture and Technology (CEAT) who had overall responsibility as the **Incident Commander (IC)**. The IC established objectives for each operational period that drove the operations. Management involved establishing specific and measurable objectives that aided the development of the strategies, tactics, tasks and activities required to achieve the objectives. The IC quickly established the command staff positions, delegating functional responsibilities as required. These included the Public Information Officer (PIO), Safety Officer (SO), Liaison Officer (LNO) and Technical Specialists, as shown in Figure 3. To ensure that the functional aspects of the ICS structure were in place, the IC established the general staff, which consisted of Operations, Planning, Logistics, and Finance/Administration sections. The personnel assigned to each ICS role is outlined within the organizational charts in Figures 3, 4 and 5. These illustrate the expansion and contraction of the ICS organizational structure based on operational needs.

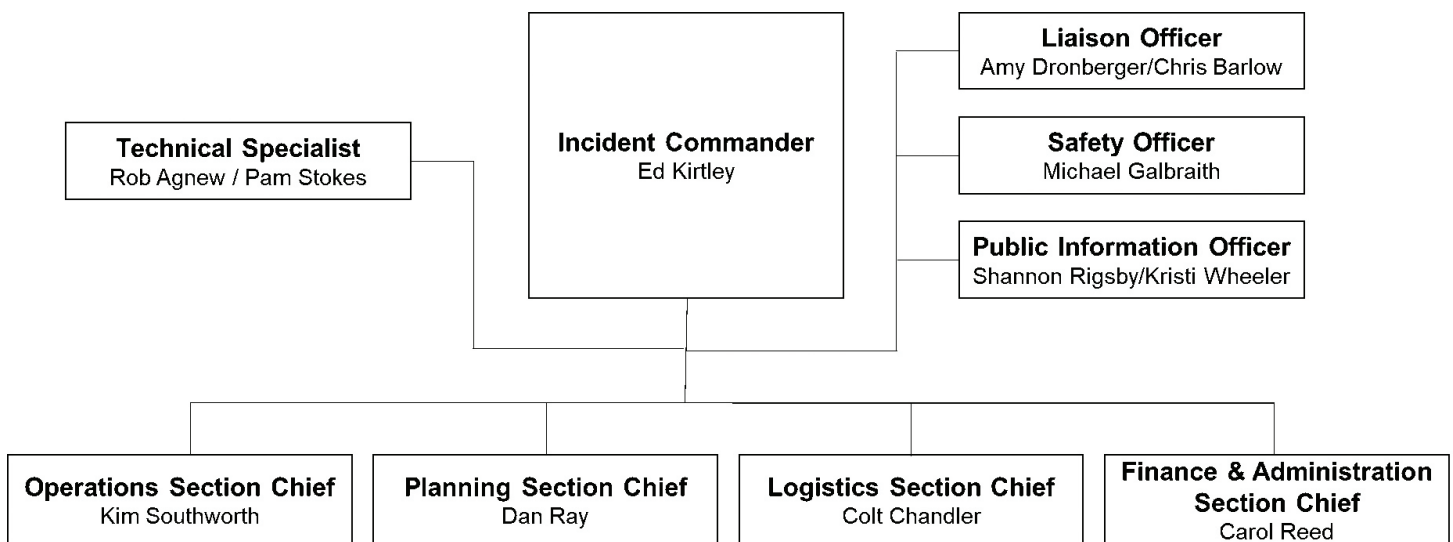


Figure 3: Initial Organizational Structure (March 19, 2020 to April 8, 2020)

IMT Position Roles and Functions

The **Public Information Officer's** responsibilities included liaising with the media, arranging interviews and tours of ODL, monitoring media information and providing informational services for the operation and the public. The PIO also prepared the status reports to facilitate OSU leadership situational awareness.

The **Safety Officer** identified and mitigated hazardous situations, reviewed and approved the Medical Plan and ensured that safety messages were disseminated at briefings.

The **Liaison Officers** worked across OSU Medicine, internal OSU groups and OSDH to provide administrative updates to the IMT and served as the main point of contact for the ODL.

Technical Specialists provided expertise in functional areas and guidance on setting up the lab according to the Centers for Disease Control and Prevention (CDC) recommendations and all state and national codes. The team remained available for the training of staff, administration of prophylactic immunizations, as well as monitoring the health of all volunteers throughout the process.

The **Operations Section** implemented the tactical operations required to carry out the plan. They developed the operational work assignments, directed the resources, and monitored the resource status.

The **Planning Section** prepared and documented the Incident Action Plan to accomplish the operation

objectives; maintained resource status; collected, evaluated and displayed incident situation information; and prepared and archived operation-related documentation.

The **Logistics Section** was responsible for providing support, resources and other services that were needed to meet the operational objectives and for personnel directly assigned to the operation. This section handled everything from setting up and maintaining a computer lab for use as a data entry hub, to providing rooms and food for personnel, to organizing security at the OADDL facilities.

Finance and Administration provided the financial management related to the IMT operation, which included the monitoring and tracking of expenses and the accounting, procurement, time recording and cost analysis.

As the operation complexity grew the need to expand the Operations section became necessary and functional groups (branches) were established. To support this expansion, the Planning, Logistics, and Finance/Administration sections were also expanded with the necessary units as illustrated in Figure 4.

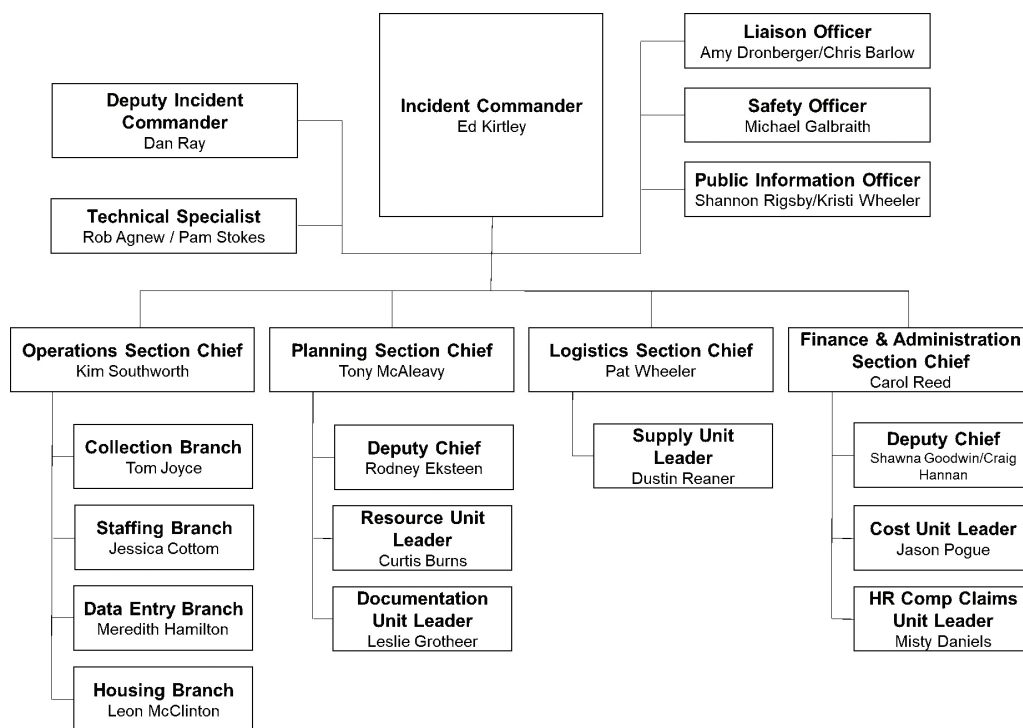


Figure 4: Expanded Organizational Structure of the IMT (April 8, 2020 to April 27, 2020)

These branches and units had specific functions: The Collection branch was responsible for the pickup, transportation and delivery of swabs (samples) from OSDH testing sites to the ODL. This initially included the use of OSU transit drivers and OSU motor pool vehicles.

The Staffing Branch was responsible for processing staffing of the lab and provide clerical support personnel for ODL operations.

The Data Entry Branch fulfilled the increased sample intake and data entry requirements for the lab.

The Housing Branch was responsible for implementing the requirements for the Oklahoma DHS Continuity of Care initiative (isolation housing).

The Resource Unit prepared and maintained displays, charts and lists that reflected the current status of resources and tracked the delivery of resources and supplies.

The Documentation Unit provided, maintained and archived all IMT-related documentation (specifically ICS forms 201, 202, and 214) on the SharePoint network drive.

The Supply Unit ordered, stored and distributed equipment and supplies and maintained the inventory necessary to support the needs of the ODL. They also transported samples and PPE required by staff.

The Cost Unit collected all cost information for cost recovery purposes and provided cost estimates and recommendations. They also processed administrative paperwork associated with contract services.

The HR Comp Claims Unit was responsible for maintaining all documentation related to workers compensation and ensured that all personnel time involved in the operation was recorded.

More than 50 individuals were directly involved in the IMT operations (see Appendix B).

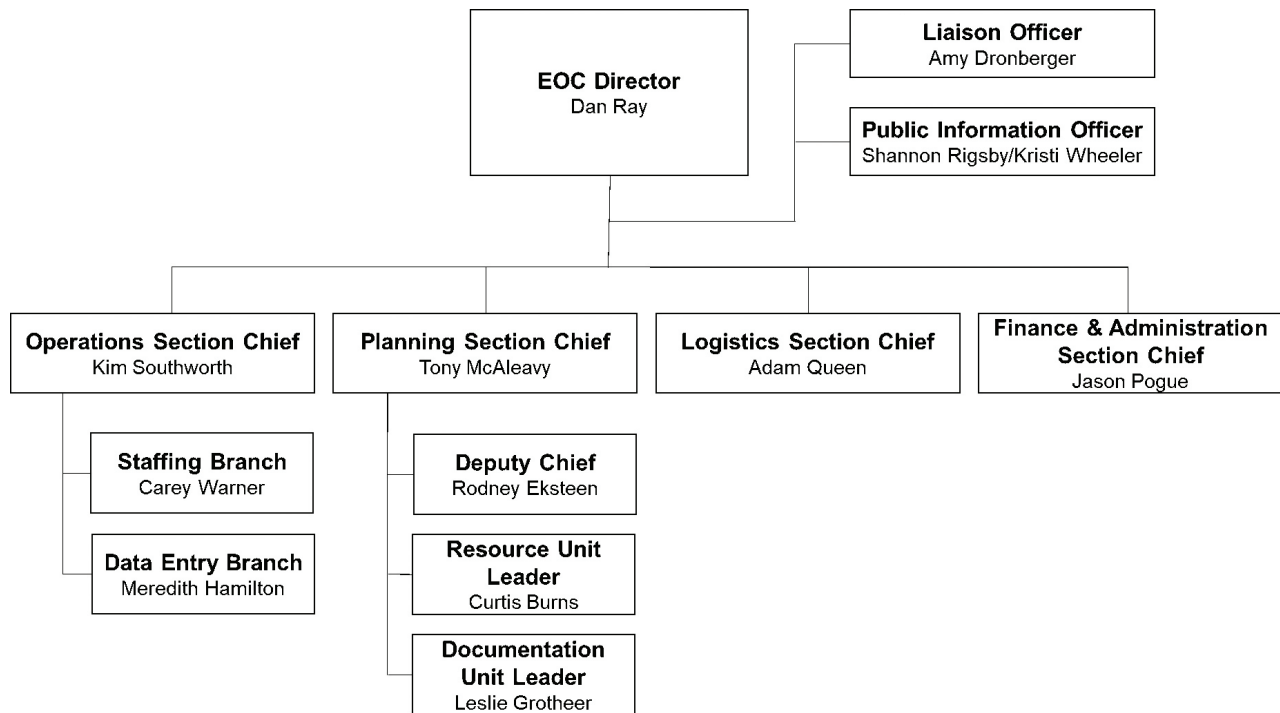


Figure 5: Organizational structure post demobilization of the IMT

Once the mission objectives were accomplished and the operations stabilized, the IMT was demobilized. The demobilization process included a closeout briefing that captured the essential information for continuing safe and effective operations, and notifying all personnel involved in the operation. The IC facilitated this briefing which took place at McElroy Hall, Room 101 on April 24, 2020. At 8 a.m. On April 27, the IMT was demobilized after operating for 39 days. All functions and responsibilities were transferred to the OSU EOC and ODL administration (see Appendix C).

The OSU EOC, which is located in the basement of the UHS, coordinates with OSU departments, local governments, and the State of Oklahoma to identify and mobilize resources before, during and after a crisis event. The facility provides an area where the members of the OSU Emergency Operations team can assemble and access up-to-date information. The OSU EOC continued to monitor the sample collections and delivery to ODL which was taken over by the Oklahoma National Guard (OKNG) on April 20, 2020. Figure 5 illustrates the organizational structure of the EOC after the IMT was demobilized.

“I’m lucky that I have been able to be part of the incident management team. The dedication of the people who agreed to take on these extra duties has been remarkable.”

Shannon Rigsby, Public Information Officer

SECTION III: OPERATIONS

Introduction

This section provides a chronological overview of the IMT operations from activation to demobilization. The first IMT briefing took place on March 24, 2020 with major operations commencing on March 26, 2020; command and general staff briefings took place during each operational period. The initial operational period was 24hrs and extended to 48hrs as the operations stabilized. However, this time-period was reduced to 24hrs in preparation for the forecasted peak on April 21, 2020, which is illustrated in Figure 6.

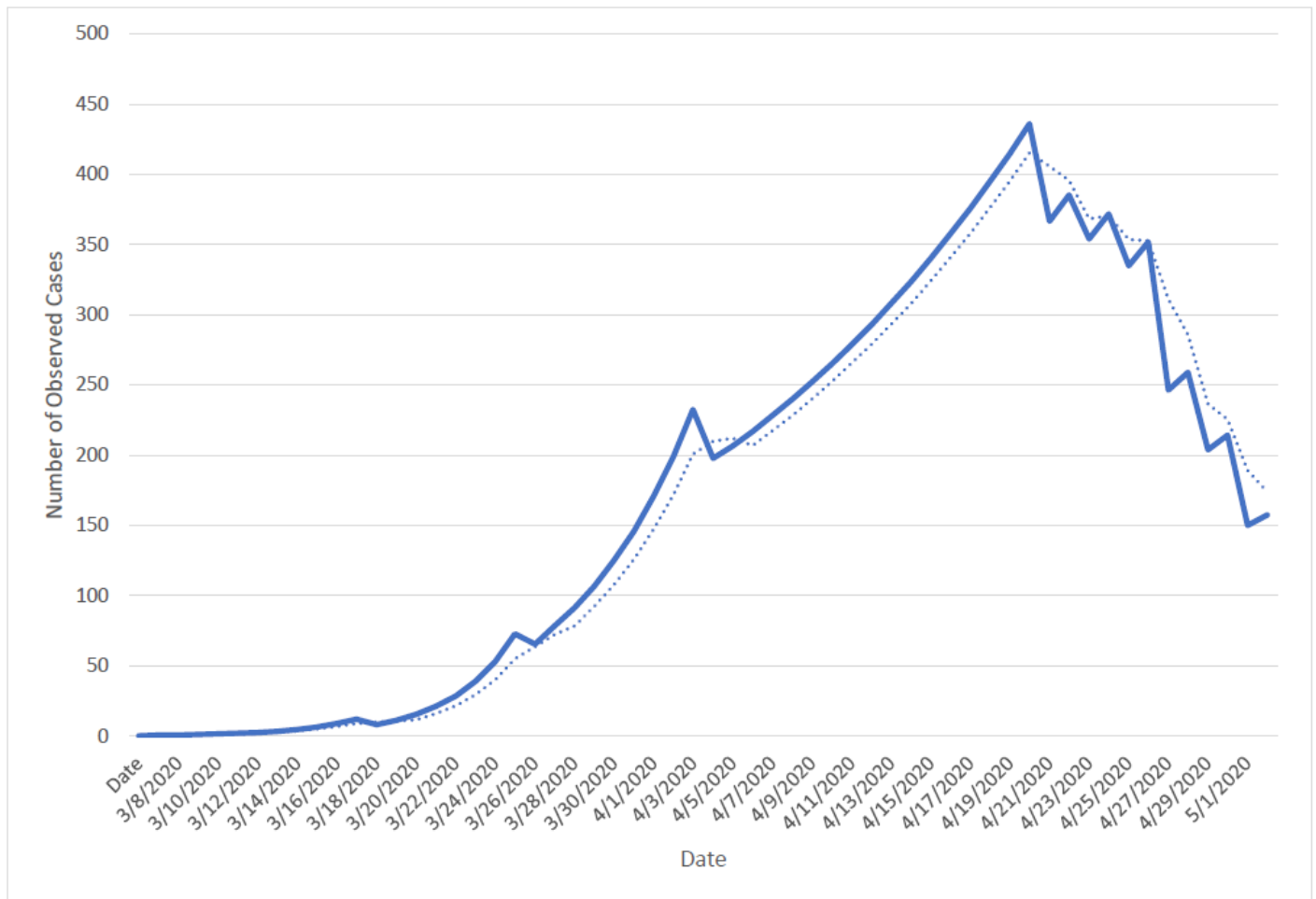


Figure 6: Modeled epidemic curve used to forecast the peak of observed cases of COVID-19 in Oklahoma from March 8 to May 1, 2020. (Source: OSDH Transmission Dynamics Model <https://coronavirus.health.ok.gov/>)

In addition to the briefings, members of the IMT met regularly to develop specific objectives, determine key actions, identify resource requirements and to conduct many other necessary activities to help stabilize the situation. Due to the potential for exposure, all IMT personnel were instructed to exercise physical distancing and follow CDC guidelines and hygiene procedures. Meetings and briefings were conducted virtually; except EOC-based personnel, who were required to wear masks and maintain physical distance, as shown in Figure 7. Several informational posters were also developed to improve general safety awareness (see Appendix D).



Figure 7: An IMT briefing in the OSU Emergency Operations Center with other IMT members connected virtually.

Summary of Key Operations

03/19/20: Dr. Kenneth Sewell, Vice President for Research, appointed Ed Kirtley, Assistant Dean of CEAT Engineering Extension, to lead the ramping up of operations at ODL. An Incident Management Team was immediately organized using staff, faculty and students from various departments and colleges within the OSU.

03/24/20: The following 10 days were identified as the most demanding for the IMT. The initial focus was directed at finalizing the on-boarding of ODL staff, implementing a health monitoring procedure for all staff working in the lab Health Insurance Portability and Accountability Act (HIPAA) training and adopting the exposure and isolation protocol. Other immediate priorities covered all support processes for the initial operation and included preparation for step-up operations in the future.

The plan was to have all support processes in place and a full support team for the lab ready by April 3. The expected length of service of the IMT was determined to be two to four weeks before duties were turned over to the EOC.

03/26/20: Governor Kevin Stitt arrived at the OADDL for a tour, facilitated by Dr. Jerry Ritchey, and visited with lab staff about the testing process. Ten thousand laboratory test kits were received on March 25, 2020 and orders for more were in place. The OSU EOC was officially activated at 11:00 a.m. The initial operational objectives were focused on ensuring the health of lab staff during the testing operations with support from OADDL leadership, University Health Services and OSU Environmental Health and Safety. The health precautions included medical physicals, immunizations, blood borne pathogen training and respirator fit testing. In addition, with support from Residential Life, accommodation was secured for

those lab staff requiring overnight lodging. Jason Pogue, of VPR Sewell's office and Caroline Reed, from CEAT Fire Service Training, initiated the setup of a financial tracking system and recordkeeping process. Procedures were put in place to enable cost recovery for expenses associated with the operation.

03/27/20: A survey (see Appendix E) to identify individuals with knowledge of lab operations was sent to all faculty as well as the deans, directors and department heads. More than **190** people responded on the first day with over **260** total responses. The first COVID-19 positive samples were delivered to OADDL from the OSDH for verification of the testing process.

Kim Southworth and Pamela Stokes facilitated the immunization, training, respirator fit tests and more for individuals identified to work in the lab. Bloodborne pathogen training, respirator physicals and other training was completed. Several pieces of equipment were procured and delivered including additional N95 masks.

The first media release on the lab was sent out, announcing that a lab on the OSU Stillwater campus was assisting with COVID-19 diagnostic testing. There were some misconceptions amongst the public that the lab was providing nasal swabs. Plans to push multiple messages to rectify the issue were put in place by the PIO. A joint media release was issued from the state to media outlets in conjunction with a press conference. The information was also pushed on the OSU social media channels.

03/28/20: The verification process confirmed that the instruments and/or test methods utilized at the lab performed as intended in the laboratory environment, and for the patient population. The results indicated **100 percent accuracy**.

03/29/20: The courier process for transportation of samples was streamlined and the lodging needs, lodging inspection and food contract were finalized.

03/30/20: Samples were couriered from Immy Labs in Norman, Oklahoma and arrived at ODL for testing. These were 100% matched between facilities. To facilitate the additional workload, a business-office front was established at the Center for Health Sciences that diverted calls from UHS and ODL. Position numbers for the additional lab employees were established with HR, and payroll was set-up. Additional locations for quarantine were identified if they were needed. A communication (see MEDIA & COMMUNICATIONS PLAN) and waste management plan was developed, and the health monitoring, exposure and isolation plans were submitted for review.

03/31/20: Using a commercial courier service, the first large collection of **53 samples** were delivered to the OADDL. The OSDH notified the VPR's office that they would be establishing nine more drive-through clinics on Friday, April 3, 2020 and all the samples collected would be destined for testing at the ODL. In addition, the overflow from the lab at St. Francis Hospital in Tulsa, was scheduled to be delivered to the ODL. Pickups also came from an OSU Center for Health Sciences mobile medical bus that primarily tested health care professionals. Based on the increase in sample collection, the IMT developed projections for the quantity of disposables required for operating with one, two and three shifts. The health monitoring plan was implemented for all staff working in the lab. The compensation plan for exempt employees, non-exempt employees and graduate students was completed. All supervisors of the additional lab personnel identified in the first group, were briefed on their role by the Incident Commander. A media release announcing the lab's entry into the COVID-19 fight and social media graphics emphasizing that the lab did not test individuals was produced.

04/1/20: The OSU Diagnostic Laboratory tested the **53 samples** received on 03/31 by 11 a.m. The on-boarding process for Group 1 was nearing completion and a briefing on exposure, the isolation plan, and

health-monitoring needs was concluded. An additional 18 individuals in Group 2 entered the onboarding process. The IMT shifted to planning for a sustained long-term operation. To ensure that record keeping was kept up-to-date and communication within the IMT was enhanced, a bulletin board in SharePoint containing all documentation related to the operation was setup and maintained.

Governor Kevin Stitt recognized the lab publicly for its contributions and ability to increase sample testing in the state of Oklahoma. The Tulsa World and Channel 9 from Oklahoma City visited the lab and interviewed Dr. Kayse Shrum and Dr. Kenneth Sewell did an interview with Iowa Public Radio. A webpage devoted to the lab was launched and a link from the homepage for the university was added: go.okstate.edu/coronavirus/laboratory-resources.html.

Healthcare providers requested seven-day a week service that included weekend pick-ups. Same-day sample delivery became vital for the lab's operation. A courier service was setup with drop-offs between 5-6 p.m. and 9-10 p.m. Additional lab staff were added to be present for the daily drop-offs and to log and barcode the incoming samples in the evening.

04/02/20: 145 samples were tested. The daily sample testing was growing fast as more health care providers dispatched samples and additional drive-through testing clinics were created around the state. Tracking and projections of disposables and laboratory test kits were developed. The need to determine accurate scheduling of individuals into the lab was prioritized. In addition, the need to collect and transport samples from the various state health departments became necessary as the courier service was unable to adequately service the demand. To enable this, it was identified that the IMT needed to expand to incorporate a sample collection unit to pick-up and deliver the samples. Establishing the capacity to collect the samples directly from the clinics would provide the lab with the number of samples scheduled for delivery more quickly. The need for additional workstations for administrative and data entry personnel was identified and put in place. The need for a supply unit was also identified to support Dr. Jerry Ritchey and Emily Cooper at the lab with their day-to-day supply needs. To further support the healthcare providers, Dr. Amy Dronberger and Emily Cooper initiated the development of reporting systems and structures to ensure the timely delivery of sample test results back to the health care providers. Another media release was sent out titled: COVID-19 diagnostic lab at OSU accelerating testing in Oklahoma.

04/03/20: 79 samples were tested, and **848 samples** were delivered to ODL. There was a significant increase in samples submitted from Stillwater Urgent Care Clinics and the Stillwater Medical Center. The IMT focused on supporting the operations and staff needs in the lab. The IMT organizational structure was expanded to support this effort. The Collection Branch was added to the IMT organizational structure with Tom Joyce serving as the branch director. The immediate task was to develop a plan to collect samples from all OSDH clinics to be transported to OADDL. In addition, a Staffing Branch was added enlisting Jessica Cottom to manage the unit. Cottom was responsible for tracking and processing all employees, including lab, administrative and students' employment records and timecards up until May 1. Due to the ongoing and intense working conditions, the rotation of general staff within the IMT was identified. Section chiefs arranged for the new staff to be briefed and prepared for their respective assignments.

04/06/20: The collection and transportation of samples plan for the ODL was completed over the weekend (in two days). The plan (see SAMPLE TRANSPORTATION PLAN) was implemented with 10 OSU drivers reporting to the EOC for a briefing, receiving assignments and equipment, as shown in Figure 8, before collecting 241 samples directly from the nine OSDH districts as illustrated in Figure 9. This branch quickly grew to 26 members that consisted of support and transportation personnel.



Figure 8: Collections Branch briefing by Tom Joyce for OSU drivers prior to assignments

Oklahoma State Department of Health

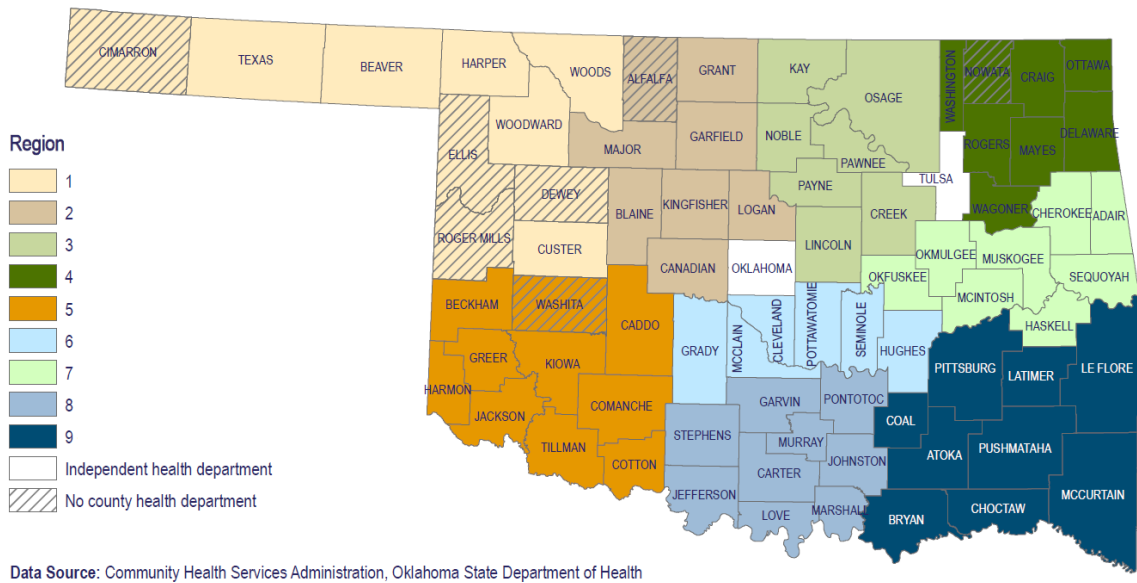


Figure 9: Oklahoma has 9 regions that incorporate 68 county Health Departments and two independent city Health Departments serving 77 counties (OSDH, 2020)

A laboratory in Norman, Oklahoma, was identified to test overflow samples and OSU Mailing Services was prepared for the possible use of Fed-Ex to transport additional overflow samples to a lab in Lubbock, TX. The OSU College of Education, Health and Aviation’s Flight Center was contacted to determine if they could assist with the collection of samples if required. To provide and keep track of the resources necessary, a supply unit and inventory system for OADDL and the IMT was established at the EOC.

Six clerical employees from a temporary employment agency started at the lab to help with data entry. A data entry branch was added to the IMT structure and 15 workstations were set up in the CEAT computer lab (Engineering South). Meredith Hamilton supervised the data entry personnel who worked shifts from 8 a.m.-12 p.m. and 6 p.m.-10 p.m. The six temporary hires (Express Professional Employment) were trained on April 6 and began entering data on April 7. For the Express hires that were not OSU students, Brad Barnes was able to provide them with temporary OSU emails and give them access to VetView and the shared drive at ODL.

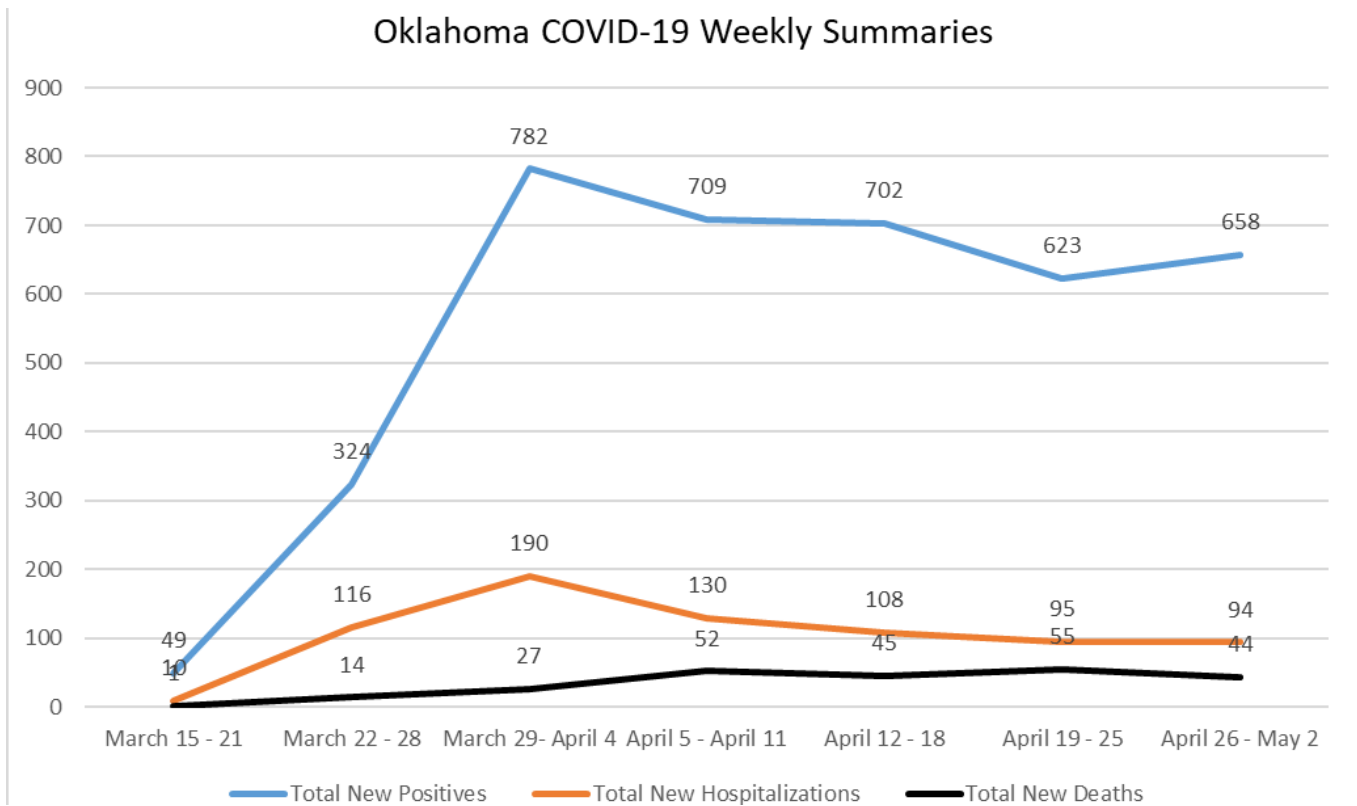


Figure 10: Tracking and initial spike of new positives, hospitalizations, and deaths due to COVID-19 in the state of Oklahoma from March 15 to April 27 during the operation of the IMT. Chart developed by Randy Seitsinger with source data from Oklahoma State Department

Randy Seitsinger, Associate Dean for Academic Affairs for CEAT, provided daily charts, as illustrated in Figure 10, tracking COVID-19 cases throughout the state using data from the OSDH. These charts were instrumental in planning and projecting the requirements for resources and supplies. The PIO, OSU photographers and OStateTV compiled a media package, which included photos and video clips titled: Innovative partnership creates COVID-19 lab at Oklahoma State University.

04/08/20: The ODL received **1,040 samples**. To prepare for a potential increase in COVID-19 positive patients, the ODHS requested OSU to provide a continuum of care space for individuals to help to free up acute-care beds at local hospitals. The IMT initiated the process with OSU Housing and Residential Life, identifying suitable residence halls and the initial requirements necessary for implementation (see ISOLATION HOUSING PLAN). The plan included the use of designated residence halls for the quarantine of patients well enough to leave the hospital but who were not virus free, and/or individuals who tested positive with mild to moderate symptoms that needed a suitable location to quarantine. Consequently, the IMT expanded again to manage the additional planning and operations that were necessary.

04/10/20: ODL received **1,186 samples**. OSU transit drivers from the collections branch played a key role in significantly increasing the number of samples delivered to the OADDL. Kicking off on April 6, 2020 with **241 samples** collected, to **623** on April 7, **830 samples** on April 8 and **841 samples** on April 9, 2020. A trailer was provided at OADDL to store sanitized coolers that were used to transport the samples. Due to the significant surge of samples received by ODL, OSU Fire Service Training made three trips to MicroGen in Lubbock, TX, to deliver 3,387 overflow samples for testing from ODL (April 9-11, 2020).

To ensure sample testing accuracy was maintained, the lab completed four validations within 10 days with excellent results. The medical processing for the last few individuals from Group 2 was completed. The finance and administration section initiated steps to improve documentation and activity tracking in order to apply for reimbursement of the IMT operation from the Federal Emergency Management Agency (FEMA).

04/13/20: Group 3, which consisted of 14 people, started the onboarding process. Additional residence hall space was made available for those who needed accommodation. 21-day projections of disposables and tests required by the lab were developed. Supplies from the Oklahoma Strategic National Stockpile in OKC were identified as a potential source.

04/14/20: The governor halted the Continuity of Care initiative due to the situation stabilizing. Governor Stitt was very grateful for OSU's willingness to host the site but thankful that it was not needed. Due to the stabilization of the sample testing, the specimen collection branch initiated a request with the Oklahoma National Guard to take over the transportation routes to the nine central pickup locations starting April 20, 2020.

04/15/20: The lab received **870 samples**. The IMT completed the development of a process for supply of disposables and building the cache to meet the projected demands for 21 days of operation using two shifts. The IMT also established the systems and procedures necessary for the ongoing operation of the lab. The OSDH indicated that the situation statewide was stabilizing. The development of a Demobilization Plan was initiated to stand-down the IMT and implement a phased transfer of key operations, functions and tasks to OSU's EOC and Vet Med., Finance and administrative duties were identified to be transferred to the Office of the Vice President for Research. The collection and transport of samples would be transferred to the Oklahoma National Guard. A web page was designed to celebrate the lab and provide additional information: go.okstate.edu/campaigns/2020/COVID-19-lab.html?utm_source=bitly&utm_campaign=COVID-lab

04/17/20: The lab received **1,094 samples** on April 16 and **1,227 samples** on April 17. At this point, ODL was testing more samples than any other non-commercial lab in the state.

The IMT also developed a De-Briefing Framework to inform the development of the After-Action Report. In addition, an Escalation Plan (see EOC ESCALATION PLAN) was developed for the EOC in preparation for a resurgence of the virus.

04/20/20: The lab had tested more than **10,000 samples** at this time. Onboarding for Group 3 was nearing completion and the intake and data entry staffing was stable. IMT supervisors and coordinators began orientation of EOC, Vet Med, and other personnel in preparation for the transfer of operations. Contingency planning for future surges and supporting operations continued within the EOC. The OKNG commenced with the sample collection and transportation. Transfer of all the finance and administration responsibilities from the IMT to Jason Pogue took place.

04/22/20: The Collection Branch was dissolved and responsibility for the transportation of samples was transferred to the Oklahoma National Guard. OSU Human Resources arranged for OSU employees on administrative leave to replace workers from the temporary staffing agency. On April 21, adverts were published in the Oklahoman and the Tulsa World celebrating the lab.

04/24/20: The Demobilization Plan (see DEMOBILIZATION PLAN) was approved and the IMT was scheduled to be demobilized at 8 a.m. on April 27, 2020. The closeout briefing was held at McElroy Hall to provide an operational summary and raise any concerns before the demobilizing of the IMT.

04/27/20: Captain Dan Ray, EOC Director, assumed the role of coordinating support operations for OADDL and the IMT was officially demobilized at 8 a.m. All operations, planning, logistics, finance/administration, and incident command documentation and records were consolidated on the SharePoint network drive for cost recovery and the after action review.

"I commend the innovation of our researchers and administrators to find ways we can use our experts and resources to overcome the challenges we face as this crisis evolves."

OSU President Burns Hargis

SECTION IV: ACCOMPLISHMENTS

This section highlights the key milestones and overall accomplishments that were achieved during the IMT operations.

IMT Operation Milestones

The Incident Commander received the first call requesting support for the ODL human samples testing on March 19, 2020. The first IMT meeting took place on March 24, 2020. The IMT briefings that initially took place every day, and then every Monday, Wednesday, and Friday, enabled all personnel on the IMT to gain a better understanding of the operations. Multiple processes and activities were established simultaneously such as: intake and reporting systems, administrative support and scheduling, a data entry hub, an onboarding and training system, a custom sample transportation system, quarantine housing, a website for providers, a supply room and provision of personal protective equipment and meals to name a few. The early recognition for the need for an IMT reduced time and the potential cost of the operation.

Through the partnership with OSU Medicine, the OSU Diagnostic Laboratory achieved human testing certification in a matter of days. Hundreds of employees and students from multiple areas of campus volunteered to work at the lab. Support for the operation was unwavering across the university. The first tests were completed within 12 days of receiving the request. The lab tested its first samples, **53** in all, on Wednesday, April 1, 2020. Over the following weekend, the lab tested **835 samples**. Over the course of a few weeks, more than 13,000 tests were ordered. In about three weeks, the OADDL conducted tests for the SARS-CoV-2 virus in more than **10,000** human samples. Approximately 4% of the received samples tested positive for SARS-CoV-2. In less than two months, 40,000 people received COVID-19 test results from ODL. The lab capability has matured into a sustainable operation as the most active COVID-19 non-commercial testing laboratory in the state.

TIMELINE OF KEY IMT EVENTS IN RELATION TO SAMPLE TESTING AT ODL

- 19 March:** IMT activated by Vice-President Kenneth Sewell
- 24 March:** Meeting of initial IMT Command and general staff
- 25 March:** 10,000 laboratory test kits received at ODL
- 26 March:** OSU EOC officially activated
Governor Kevin Stitt visits ODL
- 27 March:** IMT organizational structure expanded
First samples known to be positive delivered to ODL from OSDH for verification of the testing process
- 28 March:** Verification process confirms test results are 100 percent accurate.
- 30 March:** First set of real patient samples arrive for testing
- 31 March:** First large collection of approximately 53 samples received.
On boarding of support personnel begins
- 1 April:** 53 samples tested by 11 am
Governor Kevin Stitt recognized the lab publicly for its ability to increase sample testing in the state of Oklahoma
- 2 April:** Approximately 145 samples tested
- 3 April:** 75 samples tested and a further 848 received
Data entry support initiated
Collection and staffing branches established

- 4 & 5 April:** Sample transportation plan developed
- 6 April:** Collections from county health departments begin
241 samples transported
- 7 April:** 623 samples transported
- 8 April:** IMT expands to support the Continuity of Care initiative
830 samples transported
1040 samples received
- 9 April:** Transportation of overflow samples to Lubbock TX begins
841 samples transported
936 samples received
- 10 April:** Onboarding completed for group one, two and all of ODL
1186 samples received
ODL now testing more samples than any other non-commercial lab in the state
Data entry branch established; Engineering South computer lab utilized
- 13 April:** Group 3, (14 people) starts onboarding process
- 14 April:** Governor halts Continuity of Care initiative due to situation stabilizing
- 15 April:** ODL received 870 samples
Demobilization Plan developed to stand-down the IMT
- 16 April:** 1094 samples received
- 17 April:** 1227 samples received
5,565 samples transported from County Health Departments, between April 6 and April 17
- 20 April:** Sample collection transferred to Oklahoma National Guard
ODL tested more than 10,000 samples at this time
- 23 April:** Demobilization plan approved
- 24 April:** IMT closeout briefing
- 27 April:** IMT deactivated at 08:00
Total of 14,531 samples received by ODL

IMT Operational Accomplishments

Command Staff

Incident Commander

The formulation of the IMT allowed diverse members to complement the team providing the necessary flexibility to accomplish the objectives. Staff worked together effectively throughout the operation; applying their respective networks, experience and skills to the needs of the OADDL testing initiative. The IMT accomplished every goal of the mission, ensuring the lab reached sustainable operations.

Safety Officer

The most notable accomplishment regarding safety was to ensure that the IMT followed the CDC COVID-19 safety guidelines. These requirements were compulsory at the EOC where everyone had to wear a mask, maintain physical distancing and adhere to the CDC guidelines. The IMT, EOC and ODL remained incident free throughout the duration of this operation.

The operation took place during tornado season: so, another important accomplishment was the updating of the OADDL tornado evacuation plan which had not been updated for some time.

Liaison Officer

The liaison officer served effectively as the main point of contact for the lab and reported on the current needs and next priority issues while interfacing with the OSDH to determine the future needs and bottlenecks from the state perspective. The liaison officer also collaborated with Dr. Kaul, the CLIA lab director and submitted daily CLIA and PHIDDO reports.

Public Information Officer




Compiling status reports from each IMT briefing was useful in maintaining OSU leadership’s and stakeholder’s situational awareness of IMT operations. The status reports were also useful for keeping a record of events and vital for compiling this report.





Pushing out media releases were very useful and resulted in the media contacting OSU for further information. This led to Channel 9 arriving the morning the governor came to tour the ODL. Dr. Sewell did an interview with Iowa Public Radio, which gained OSU national exposure. Dr. Sewell also conducted an interview with the Lund Report, a health publication based in Oregon.

OSU COVID-19 sample testing received international media coverage. The media package sent out on April 6, 2020 had a significant impact on this. It included a video package, B-roll, clips, an article and high quality photos that led to stories running across the United States and as far away as the United Kingdom. OStateTV developed the package with sound bites and video clips and OSU photographers took the high-resolution photographs. The package included an interview with Dr. Sewell. From this, there were 53 syndicated articles and 7 earned media articles. It ran on local Oklahoma channels - Channel 4, Channel 9, etc. and because it included video, they were able to tell the story without sending out a reporter. In addition to press releases and interviews, there were adverts placed in the Oklahoman and the Tulsa World celebrating the lab and a web page to provide additional information.

Social Media

The story of OSU’s COVID-19 response was also shared on several OSU social media platforms. Data from the three main social media platforms: Facebook, Twitter and LinkedIn are included here. The Twitter feeds used were: @okstate, @burnshargis and @okstatesafety.

Social Media Platform	Impressions	Engagements
 Facebook	386,757	40,253
 Twitter	184,178	6,523
 LinkedIn	57,400	2,480
Total	628,335	49,256

OStateTV Video
 13,000 views
 212 interactions (likes or loves)
 137 shares
 18 comments

Response from the public

Social Media Posts

Comments from social media posts included the following:

"Thank you to the scientific specialists, experts, health care doctors and nurses, support staff!"

-Joan Solon Krikau

"Go pokes!! So proud that OSU is able to help."

-Sharolyn Davis

"Way to go Pokes. So proud!!! Thank you for all the work you are doing. Stay safe. God Bless."

-Loretta Lynn Maher

"As a medical laboratory scientist, thank you for your role in determining patient diagnosis! #lab4life."

-Suzanne Campbell

"My alma mater. Thank you, Oklahoma State University, for significantly increasing Oklahoma City Indian Clinic turnaround time for providing our patients with their test results, we appreciate you!! Go Pokes!!"

-Meghan Liles

General Staff

Operations Section

The operations section was responsible for a significant portion of the processing and preparation of personnel as well as the collection and processing of samples.



Health & Safety

51 Medical Physicals
55 Hep B Vaccination Determinations
11 OSHA Respiratory Protection Training Classes (50 trained)
11 OSHA Bloodborne Training Classes (53 trained)
66 OSHA Respiratory Fit Tests



Collections

Mon to Sun, 8am to 8 pm
Created 9 routes based on 9 Health Department Regions
10 drivers per day from OSU Parking & Transit offices (total 24)
5,565 total samples transported
19,967 miles between 16-17 April
3 trips to deliver samples to Lubbock, TX from OADDL



Staff Processing

Sun to Fri, 6am to 9 pm
25 faculty/staff/students part of intake process



Data Entry

Mon to Fri, 8am to 1pm
6 OSU employees and 9 temp employees are part of the data entry process
15 admin assistants added

With the assistance of Dr. Victoria Windiate (ODL), Pam Stokes and the UHS team and EHS members, the Operations Section processed the following:

- 52 medical physicals
- 55 Hepatitis B vaccination determinations (this included a combination of verifying immunity and administering the vaccination).
- 11 OSHA respiratory protection training classes training 50 personnel
- 11 OSHA Bloodborne training classes training 53 personnel
- 66 OSHA respiratory fit tests

Collection Branch

Oklahoma State University drivers picked up and delivered COVID-19 test samples from all nine County Health Department districts in order to establish a reliable operation for the delivery, testing, and reporting of COVID-19 samples. Every morning the OSU drivers attended a briefing, conducted by Tom Joyce, where they received their assignments and sample transportation equipment. The drivers would then pickup ice for the sample coolers at Gate 7 West at Boone Pickens Stadium and then contact the EOC before departing. On arrival at the respective county health department the drivers contacted the EOC and then reported to the relevant person at the health department and waited until the samples were ready for transportation. At 4 p.m., they would contact the EOC before leaving their pick-up location and report the number of samples and estimated arrival times to the OADDL. Following this, they would return to the EOC where all equipment would be sanitized and prepared for the next day.

In total, 24 OSU drivers covered 19,967 miles and transported 5,565 samples using nine routes on a schedule from Monday to Sunday, 8 a.m. to 8 p.m., between April 6 and April 17, 2020 (see Appendix F). The Collections Branch transported 70% of all samples delivered to ODL between March 31 and April 24, 2020 as illustrated in Figure 11. This had a significant impact by relieving the burden on the OSDH county health departments. Figure 12 shows the number of samples picked-up per day with the highest numbers collected on April 8 (830 Samples) and April 9 (841 samples). Figure 13 illustrates the number of samples collected per district pickup site with the most samples collected from the Cleveland district site (1,114) followed by Rogers (1,005). Figure 14 illustrates the total miles travelled per region by the OSU drivers.

Number of Samples Delivered Per Courier

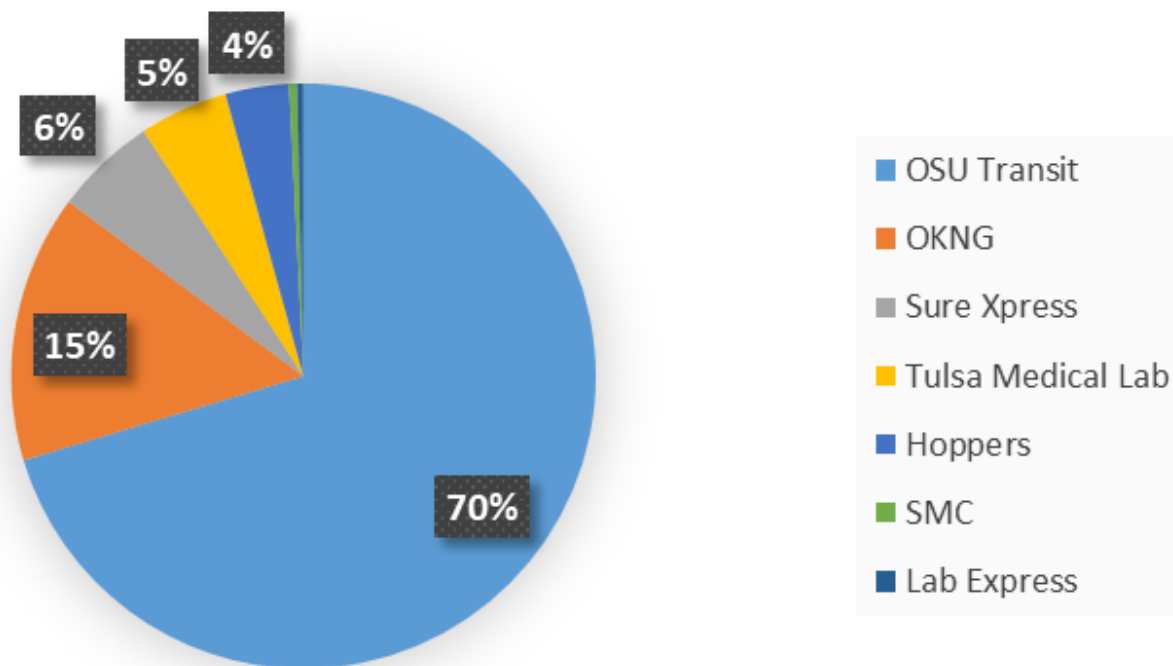


Figure 11: Number of samples delivered to ODL by the various courier services, the IMT Collection Branch (OSU Transit) and Oklahoma National Guard (OKNG) between 03/31/2020 and 04/24/2020.

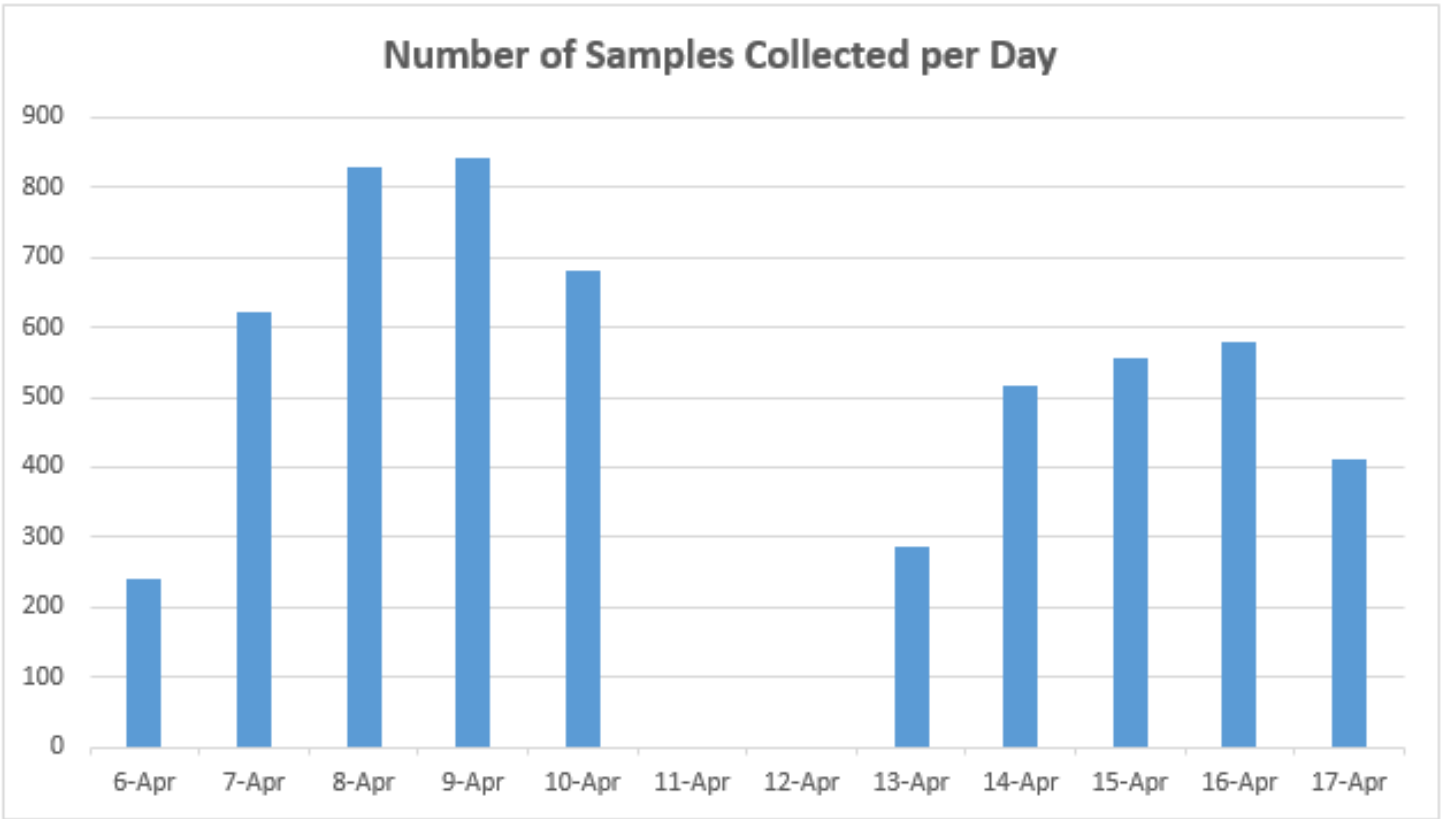


Figure 12: Total number of samples collected by OSU drivers per day from the Oklahoma State Department of Health (OSDH) County Health Department testing sites between 04/06/2020 and 04/17/2020.

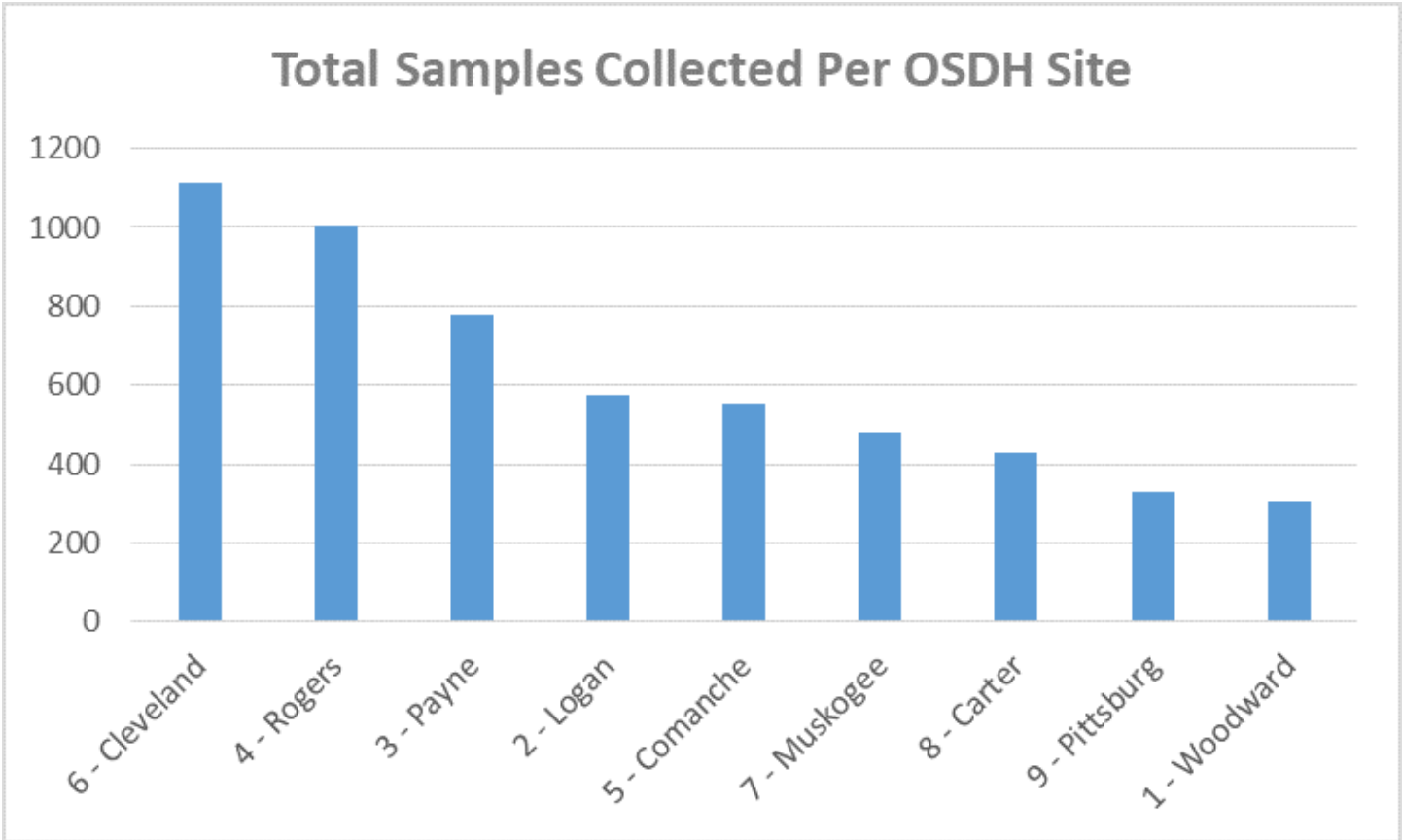


Figure 13: Total number of samples transported by Collection Branch from the Oklahoma State Department of Health (OSDH) district pickup sites between 04/06/2020 and 04/17/2020.

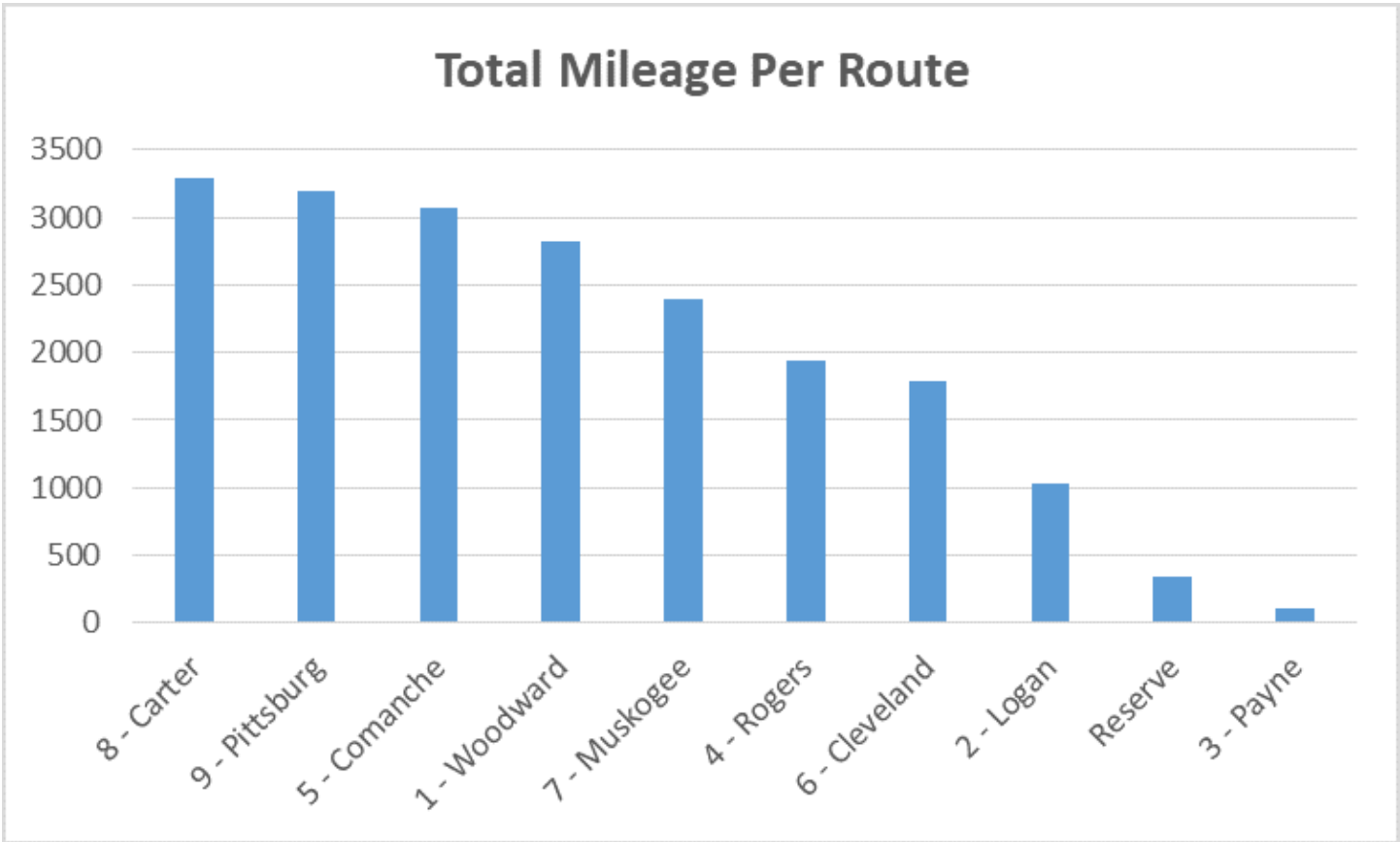
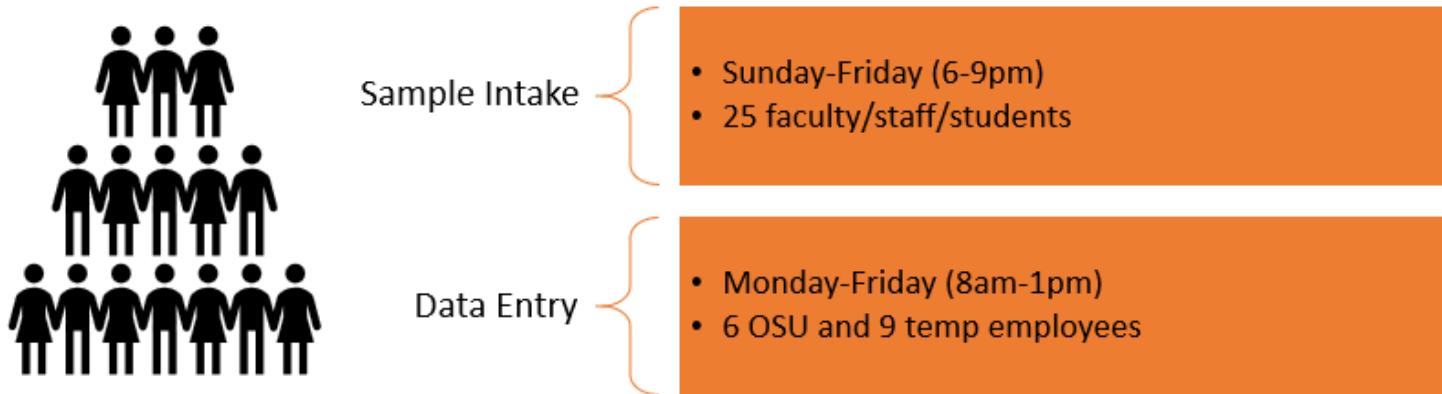


Figure 14: Total miles per region travelled by the OSU transit drivers collecting samples from the Oklahoma State Department of Health (OSDH) County Health Department testing sites between 04/06/2020 and 04/17/2020.

Staffing & Data Entry Branches

Staff processing and scheduling were handled by the Staffing Branch and data entry by the Data Entry Branch. In total, 53 laboratory assistants and 15 administrative personnel were scheduled up until May 1, 2020. The 15 administrative assistants were initially added for data entry and a further 11 were added to the data entry pool made up of OSU staff. These additional people made it possible to complete data entry in a reasonable amount of time most days.



Housing Branch

Although the Continuity of Care initiative was never fully implemented the Housing Branch identified residence halls that would have provided for the over 300 beds required. The overall plan and effort are detailed in the OSU-COVID-19 ISOLATION HOUSING PLAN.

Planning Section

The planning section, which included the resource and documentation units, developed several detailed plans and resources which assisted the operations. These also provided the EOC with the means to continue efforts and escalate operations when required. The key documents and activities included the following:

- After Action Report
- Debriefing Protocol
- Demobilization Plan
- Emergency Operations Center Escalation Plan
- Housing Isolation and Continuity of Care Plan
- Recovery Framework
- Training, Exercising and Evaluation Framework
- Updating of the situational awareness board
- Maintaining IMT SharePoint and documentation system

The IMT briefings were facilitated by the planning section and took place every Monday, Wednesday, and Friday to share information and provide the “big picture” to the IMT. Virtual meetings were facilitated using Zoom, which worked relatively well.

The utilization of faculty, in conjunction with on-campus and remotely located graduate students from the Fire and Emergency Management Program (FEMP), proved to be a valuable resource. Interestingly, a recent FEMP graduate was appointed as the Emergency Response Coordinator for the OSDH region in which OSU is located. This again proved to be a valuable resource.

Logistics Section

The Logistics Branch, which included the supply unit, was able to secure a PPE supply chain, food vendors, supplies and personnel support, identify waste solutions, assist in the sample collection system, and procure the necessary resources to support the operation. A running inventory of supplies needed for the collection, transportation and testing of samples was maintained and drivers were also provided with the supplies needed for them to accomplish their tasks.

In addition, a computer lab was establishment for use as a data entry hub, and quarantine quads (Peter-Friend Apartments 113, 213 and 313) were secured to be used as a rest area for ODL staff who may have worked a late night shift and needed a place to sleep before heading home the next morning.

Finance and Administration Section

The finance and administration section, which included the cost and compensation claims unit, effectively managed a significant increase in purchase requests and transactions for a variety of different needs related to the IMT operation. Transitioning several purchase cards (P-cards) to a single account worked well to keep track of expenditures related to the IMT operation. See Appendix G for the financial statement that was available during the writing of this report.

Oklahoma Diagnostic Laboratory

The daily delivery of samples was received by ODL from many different locations across the state of Oklahoma. Figure 15 shows the number of samples received from these locations. A total of 14,531 samples were received by ODL between March 31, 2020 and April 27, 2020. Figure 16 illustrates the number of samples received per day with the highest number of samples received on April 10 (1,186) and April 17 (1,227). Depending on the stage of record keeping and processing, the daily figures of the samples received between charts may vary. OSU PD recorded the details of samples as they were delivered to ODL. Samples were then further processed and stored in the lab before testing.

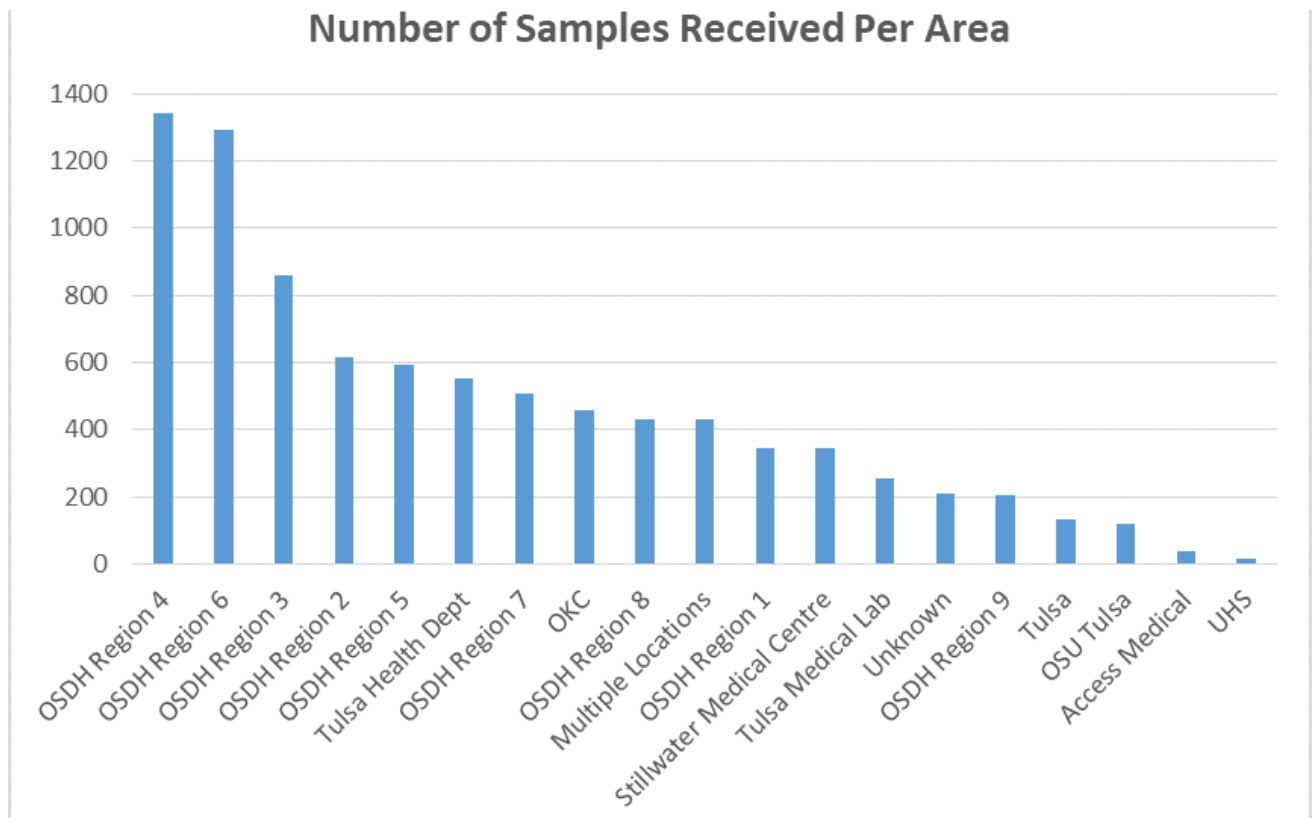


Figure 15: Number of samples received at ODL from the various testing sites across the state of Oklahoma between 03/31/2020 and 04/27/2020

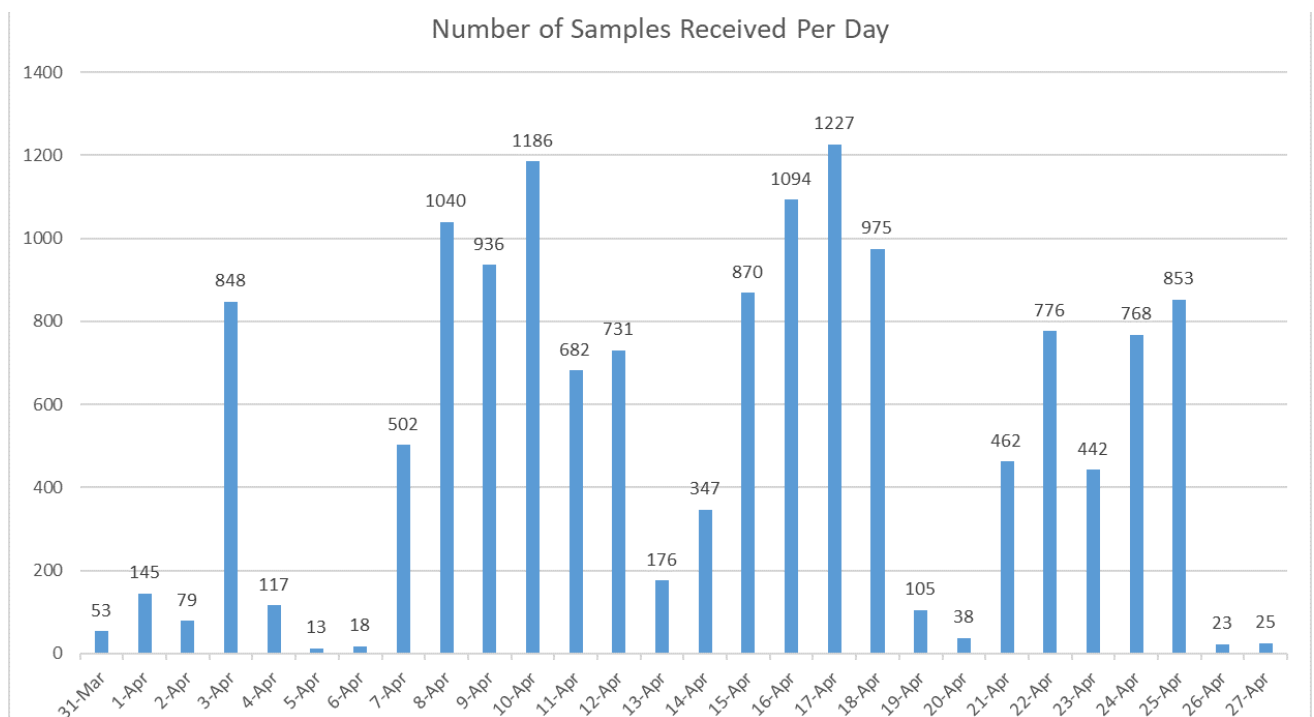


Figure 16: Total number of samples received by ODL per day between 03/31/2020 and 04/27/2020

The ODL is able to process 2,000 tests per day and provide Oklahomans with test results within 24 to 48 hours. In less than two months, 40,000 people received COVID-19 test results. By the end of June 2020, 60,000 tests were expected to be completed.

SECTION V: CHALLENGES

The challenges identified by the IMT members participating in the operation are for learning purposes, not to assign blame. Failing to learn from the challenges faced, ensures that we are doomed to repeat similar mistakes. As a learning organization, it is important to identify the challenges and to implement the processes and practices to successfully overcome these challenges in existing and future work. A challenge is a challenge for the whole IMT; therefore, they are listed generically.

The following challenges were identified during the OSU-COVID-19 IMT operation:

1. Initially, IMT members were performing tasks outside of their scope, which was helpful but caused some confusion. It was remedied when more IMT members were added.
2. There were variable levels of ICS familiarity within the IMT due to a lack of ICS training and/or experience using the system. This caused delays when timely results were necessary.
3. There was a lack of identifying nametags or badges identifying IMT members. Entities proficient in the ICS (police, fire, military) value rapid recognition and make this an early priority. This seemed to be especially crucial in sensitive areas such as the lab.
4. In the beginning, identifying the safety needs for ODDL to conduct COVID-19 testing was very challenging due to limited knowledge regarding the risk. At the time there were no clear directives.
5. The balancing act of in-person and remote work with some tasks requiring in-person knowledge and observations to ensure functionality and efficiency was problematic. Additional safety precautions were necessary which temporarily redirected the focus.
6. Communications related to purchase requirements and orders from the many different entities were challenging. More detailed resource requests/orders would have been beneficial, if provided.
7. Initially, knowing how many people to include in the data entry pool was challenging. The original number proved too small to complete data entry in a timeframe that allowed ODL to make corrections and generate reports for positive samples in a timely manner. As more members were added to the pool, it became easier to finish within a 4-5-hour timeframe rather than 8 hours. Enough OSU staff were obtained to call in backups when the sample load was larger than normal or to accommodate sick leave and medical appointments.
8. The process of setting up the lab began with strategic organization. Information regarding OSHA regulations and the healthcare processes required was initially limited. When healthcare and environmental services staff were brought in, there was already a deadline to begin testing. More intense discussion regarding training, the protection of the staff, what regulations needed to be followed and the safety of the lab would have been beneficial.
9. Team members that were not familiar with ICS initiated or completed tasks that were outside of their area of responsibility while the designated members of the IMT were doing the same function. This caused some duplication of effort reducing efficiency.
10. The large amount of information created a lack of information discipline, albeit inadvertently, resulting in members performing tasks outside their respective function.
11. Frustrations resulted when lack of communication affected the ability to make decisions. Overall, using ICS benefited the situation but could be improved upon.
12. Setting up and managing virtual meetings using Zoom were sometimes a challenge, but continued use quickly helped to familiarize team members that were not accustomed with the system.

13. The amount of time required for participation in the operation was initially underestimated by many individuals. For example, 20 hours a week for a few weeks ended up taking significantly more time.
14. The lab had to work with IT to overcome issues related to releasing reports from the lab software. This kind of challenge, if not resolved quickly, could have resulted in the need for additional clerical personnel.
15. The procurement of PPE was a significant hurdle, as it was necessary to quickly establish a secure supply chain. The global demand, limited supply options and capability to secure PPE exacerbated the problem. The IMT was eventually able to procure necessary PPE via vendors, campus counterparts and other external stakeholders.
16. Scheduling was initially very difficult because there were many different opinions on what the shifts should be and who should be doing what for the lab.
17. Notifying outside entities that the ODL was available and accepting samples, as well as how to access the lab was challenging. The processing began before marketing efforts were sent out statewide. Also, there was a great deal of confusion among Oklahoma health care providers and UHS, who received an abundance of calls but were unaware of how to guide them.
18. Contracts with two testing labs were established for daily overflow. One lab, in Lubbock, Texas, posed a challenge. The Texas lab had a reporting structure that was incompatible with the ODL. Staff had to work around the clock and over the weekend to handwrite report cases, with assistance from OSU IT and the Director of the OSU High Performance Computing Center, to develop processes to receive and interpret data.
19. A significant challenge involved finding the best system for handling inconsistencies and omissions in data provided by medical facilities. These inconsistencies included multiple or missing fax numbers for facilities, multiple phone numbers for the same facility, missing clinicians, missing facility names, missing sample collection dates, etc. Eventually a single person was made responsible for making additions and deletions to this information in VetView. This was done to reduce the number of failed reports and affidavits.
20. Some workers experienced hand and back fatigue due to the use of unfamiliar or non-ergonomic keyboards, nonadjustable desks (not able to stand while working), and chairs with limited adjustability, especially when a shift extended beyond a few hours.
21. The Oklahoma National Guard took over transporting samples from the various state health departments. There was some miscommunication regarding accurately reporting the number of samples that were going to be delivered to the lab. To resolve this, lab staff worked on getting the sample number directly from the participating health departments.
22. There were limited photographs and no video documenting the IMT operations. Once the IMT was demobilized the opportunity to highlight and document the multiple IMT operations and achievements became more difficult.
23. Information Technology challenges with software and outdated hardware within the EOC resulted in significant time delays and unnecessary complications with the operation of the IT systems. It was noted that the EOC requires an investment in technology modernization to fully support these types of operations.
24. Cellular phone reception was very poor in the EOC, which is situated in the basement of the UHS building. It was often very difficult to receive or make calls with a mobile phone when located in the EOC.
25. The different university systems and structure did not always integrate smoothly with the IMT. For example, logistics, procurement and supply was a challenge with no direct means of rapidly expediting purchases. Effectiveness and efficiency can be improved if the IMT structure and system is recognized by and further integrated into the organization. Establishing a centralized and formalized system with primary responsibility for future IMT operations would be beneficial.

SECTION VI: LESSONS LEARNED

The COVID-19 IMT operation was a valuable learning experience. Lessons learned identifies areas of note and provides actionable steps that can be put in place to learn from the experience. This section contains a summary of the lessons learned from the IMT operation, which can help develop organizational best practices. Capturing the lessons learned are valuable for future IMT's and the organization, whilst representing the organization's commitment to excellence.

Command Staff

Incident Command

- Communication about the purpose of the IMT to leadership is critical to the long-term success of the IMT. The IC needs to establish processes early on to update leadership on operations and the role of the IMT throughout the operation.
- When selecting IMT command and general staff, their credibility, authority and influence within the organization also needs to be considered. Experience and expertise in working as part of an IMT may not always be the most important criteria.

Safety

- Out of operational necessity, many of the IMT branches and units initially implemented their own safety precautions. The individual assigned the safety responsibility must be informed about the specific needs of the individual units.
- It would have been useful to have had an individual more familiar with the inner workings of the lab, so that the safety needs could have been more appropriately identified, addressed and monitored.
- More detailed reports of any safety issues in the lab would have been beneficial during the IMT briefings.

Liaison

- While there was a basic understanding of ICS structures from past education, there was no hands-on knowledge of structure, which would have been helpful, although hard to recognize as a priority during the time of crisis.
- Understanding and being able to communicate from the start what type of amenities are for 'crisis' mode versus sustainable operations would have been helpful, for example, knowing when food contracts and/or "COVID pay" would change.
- Structuring reports would have been helpful for better communication from the liaison to the other members of the IMT.
- More than one liaison would have been beneficial to learn the "weeds" of the operation and be able to move pieces forward.

Public Information

- Attending all the command and general staff IMT briefings were crucial for obtaining background information from the various sections on the many activities that were occurring. This was also very beneficial for preparation of the status reports.

- The attendance in small-group meetings that dealt with the details of transportation and other issues, was invaluable for understanding the regular IMT briefing. This provided valuable experience that could be utilized in future IMT operations.
- The initial focus was so fixed on the lab that it was only later in the process that the importance of how vital the IMT organization was to the success of the mission was realized. For future events, video and photographs of meeting participation and activities of the IMT would be beneficial to fully document the accomplishments and dedication of the team.

General Staff

Operations Section

- Publishing as much guidance and intent as possible in the early stages of the mission enabled operations to adapt as the mission requirements evolved. The clear desired end state for all major functions, approved by the university leadership, published within the IC's objectives at the beginning of the mission was crucial. This enabled lower level leaders to adapt and make decisions, within the IC's intent, as they worked towards achieving the university's desired end state for the mission.
- Considering that the OSDH were the main organization that was being supported, participation at meetings would have helped to improve communication, information accuracy and help determine that their needs were being met. A representative from the OSDH should have attended the IMT meetings (via Zoom).
- The members of the IMT leadership that were selected to fulfill the relevant roles contained the subject matter experts that were needed to accomplish this mission.
- Incident management training for OSU staff would be valuable for future incident management operations of this size and nature. Senior leadership could be included in training on command and general staff positions, and the significance of the EOC.
- It would be valuable to be able to verify that individuals have the necessary credentials (training and experience) in the areas that they are being assigned to.
- The EOC is a critical resource in crisis and incident management operations. The facility needs to be upgraded and modernized with the appropriate ICT and workstations.

Collections Branch

- Appointing one person to be the central point of contact for certain functions made coordination much more efficient. Having the one central point of contact at the OSDH (Neil Hann) enabled the necessary information to be collected and distributed quickly.
- The OSDH Regional Health Directors' willingness to adapt their plans to support OSU's collection mission, by creating central pick up locations for their regions, was integral to the success of our mission.
- The first day that OSU drivers arrived for a briefing, there was little social distancing in both the parking lot when they arrived and in the briefing room. Also, no PPE was distributed the first day. The following day masks were distributed to drivers who did not have one and they were required to wear them before entering the building. Signs were also created and placed on cones to successfully separate the drivers upon arrival before they entered the building as shown in Figure 17. The signs worked well for a temporary period. If the OSU driver operations were to be longer term, the signs would need to have been more substantial to withstand wind.

- Drivers and staff were also required to use hand sanitizer before entering the briefing room, and they were provided with a small bottle for use during their route, as well as two pairs of disposable gloves. Drivers were briefed on how to use and remove gloves safely. The briefing room tables, chairs and items, like clipboards, were sanitized each day.



Figure 17: OSU drivers gather outside of EOC in preparation for the morning briefing

Staffing Branch

- Scheduling was very difficult because there were many different opinions of what the shifts should be, who should be doing what for the lab, etc. It worked out well to get a schedule together of everyone available and then make the adjustments as required.
- The amount of time required for participation in the operation was initially underestimated by many individuals. For example, 20 hours a week for a few weeks turned out to be much more than that. Additional time allocation should be factored in.
- There were times that schedule changes caused issues for others without them being aware of it. Having one point of contact for lab needs is imperative so that when changes come up, all those that need to know can be informed.
- A system to call-back employees for assistance to support operations is needed. OSU had a large contingent of personnel that were at home on administrative leave. There was no integrated system and process to have them come back to perform other duties or duties assigned by the IMT/EOC. Instead, temporary workers had to be hired. It took over a month to get a system going to use our own employees. Having a system of deploying OSU personnel in temporary roles would have saved time and money. Personnel would not have been at risk or exposed in these new roles.

Data Entry Branch

The level of computer skills (including typing) and the level of attention to detail was highly variable among the members of the data entry pool (primarily the volunteers from OSU). In retrospect, we should have developed some type of review or screening process that allowed us to choose individuals whose normal job activities were more aligned with the skills required for data entry (i.e., the ability to type quickly and accurately for extended periods of time; the ability to provide a high level of attention to detail).

Planning

- The Planning Section ramped up quickly using voluntary support, primarily from the CEAT FEMP. Whilst, this worked well, it was reliant on good will (which there was plenty of). Developing a trained and exercised team of IMT volunteers to augment EOC operations would streamline the stand-up process in the future.

Resource Unit

- Having a central liaison at the ODL for the IMT, in which information could have been shared and ideas discussed while researching and planning, would have streamlined the process. This would have presented a better overview of the details needed to make decisions or presentations while working on assigned projects.

Documentation Unit

- Clarity of information dissemination is essential. The IMT members had various levels of knowledge and experience regarding the ICS system. Creating a short document that identifies ICS structure, the roles within the structure, and the ICS forms that need to be used would be helpful for future operations. IMT members must understand where they fit within the organization and what forms they are responsible for.
- A more user-friendly, information-sharing platform, other than SharePoint, would have been beneficial for the IMT operation. It can be difficult to select a platform with which everyone is familiar. The site should be set up by someone knowledgeable of the application and how it is best utilized.

Logistics

- The Logistics section needed more staffing earlier on during the initiative. In review, if more staff had been requested earlier this would have made the last half of the operation run smoother. Identifying staffing needs early will help to ensure long-term stability and a smoother progression.
- Starting earlier to identify and secure state and local government PPE supply chains, other than commercial PPE supply chains.
- Reassigning existing daily functions of IMT member's permanent roles would have allowed more time to be dedicated to the IMT needs.
- Opportunities to participate in and practice ICS principles can be limited. Continuing education in the ICS framework and function would be beneficial.
- Information discipline could have been improved by ensuring that all members were aware of all the actions that were taking place. A central liaison between the ODL staff and the IMT put in place early on would have helped to streamline this process.

Supply Unit

- Establishing relationships in line with the chain of command to support around the clock communication.
- A contingency plan to replace oneself if unable to continue in the function both temporarily and long term.
- Obtain communication in an electronic format to ensure that information is retained and further clarified if necessary.

Finance & Administration

- Integrating several P-cards onto one account from the beginning of the operation worked extremely well to keep track of expenditures by the IMT.
- Reducing some of the P-card requirements were beneficial in expediting and improving efficiency of purchasing during the IMT operation.

SECTION VII: RECOMMENDATIONS

In this section of the report, recommendations are provided to address the identified priority areas for improvement. Each recommendation also includes the benefits of acting on the recommendation. The recommendations are based on key findings from the entire review process.

Recommendation 1

Identify and develop a cadre of trained OSU volunteers (students, faculty, and staff) and formalize the IMT to support future operations, provide long-term stability and positive progression.

The EOC regularly responds to routine emergency incidents as part of its normal operations by using pre-established standard operating procedures (SOPs). However, when incidents increase in magnitude or complexity and surpass the scope of those SOPs, additional resources and coordination may be required to support emergency response and recovery efforts.

An IMT provides management support during incidents or events that exceed the EOC or campus's capability or capacity. The role of the IMT is to provide support to the operations through communication, coordination, and resource management functions. The IMT does not respond to the scene but is responsible for managing and directing the response activities.

An OSU All-Hazard Incident Management Team (OSU-IMT) could provide the command and control infrastructure required to manage the logistical, fiscal, planning, operational, safety, and campus issues related to any and all incidents/emergencies. The OSU-IMT would take immediate action following notification of an incident prior to assembling a full university response. An OSU-IMT will be made up of individuals who serve as the primary IC's and command and general staff and will be comprised of representatives from university departments. The OSU-IMT would follow the requirements set forth by the National Incident Management System (NIMS). Formalizing the IMT will significantly increase the efficiency and effectiveness of future IMT deployment.

Recommendation 2

Train, exercise and evaluate the OSU response plans and IMT capabilities regularly in conjunction with the EOC.

Exercising response plans provides the university community with opportunities to develop practical skills and knowledge of operating an IMT on campus using the ICS. It also provides real-world examples and practice using current scenarios to enable the IMT to further integrate as a team and manage fast-moving and complex evolving events and incidents. These could include large sporting events, health crises, business disruption, mass casualty events, etc.

IMTs use a set of well-developed core plans that provide the foundation for the team to address multiple complex and evolving situations. At OSU, these plans are developed at the EOC. The plans allow for flexible proactive and active postures in matters unforeseen and/or not covered by the elements of the plans.

Training, exercising and evaluation of plans and personnel are vital to maintain and enhance the capability. The EOC and associated response plans that have already been developed could be utilized for training, exercising and further evaluation of the IMT. This could be accomplished on a quarterly training and exercising schedule with an annual evaluation.

Recommendation 3

Upgrade workstations and modernize the information and communications technology available in the EOC.

Monitoring incidents for potential escalation and developing initial situational assessments helps to coordinate response activities across divisions and departments. The EOC provided an excellent platform for coordination of the OSU COVID-19 IMT operation. However, it requires upgrading.

Situational awareness was an ongoing challenge during the OSU COVID-19 response despite the use of the relevant ICS forms and SharePoint. The use of an electronic incident management system (IMS) could help in this regard. The IMS status boards and data accessibility, both visual and textual, could provide a significant enhancement over the ICS forms/SharePoint method. IMS systems are designed for web-based operations and can easily be accessed remotely using computers, tablets and smart phones. Such a system could have integrated the IMT, OADDL and the OSDH data, or indeed any future operational stakeholder. In addition, there may be occasions when members of the IMT cannot physically report to the EOC. To support virtual EOC operations, the university can utilize an off-campus hosted application such as VEOCI, a virtual EOC software that is specifically designed to support EOC operations, regardless of where its members reside.

The IMT can also act as the initial emergency operations center response team. Beyond that, a monthly or bi-monthly EOC operational test would help to ensure that the hardware, software and systems are routinely up-to-date and functional. This could become part of the OSU-IMT activities.

Recommendation 4

Enhance senior OSU leadership knowledge for the needs and benefits of an OSU-IMT and the use of the OSU EOC for both emergency and non-emergent events.

IMTs are critical in leading or participating in a university's or college's crisis or emergency response and continuity and recovery efforts for all hazards. IMTs advance emergency preparedness, crisis and risk management, and resilience on campuses. IMTs are a cost-effective and efficient way to link, leverage and align limited resources during a crisis situation.

The recognition of the value and support of an IMT by university leadership can minimize the damage inflicted by an event. University staff, faculty and students have certain skills and abilities that can be successfully leveraged through the formulation and participation in an IMT.

The IC of an IMT will vary depending on the incident. The IC should be an individual with the specific skills, knowledge base and training needed to manage the specific situation. It is always at the discretion of university leadership to identify an IC, or co-ICs, for an incident.

IMTs operate within the guidance provided by the National Incident Management System (NIMS). This provides a nationwide template enabling federal, state, local, and tribal governments and private sector nongovernmental organizations to work together effectively and efficiently to prevent, prepare for, respond to, and recover from domestic incidents regardless of cause, size or complexity. Using NIMS will enable the university to communicate and coordinate OSU-IMT response actions with other jurisdictions and emergency response agencies. A core principle of NIMS is that an incident should be managed at the lowest level possible, with only the amount of resources necessary to successfully respond to the incident.

Working with people with different skill-sets, that applied their individual years of experience and knowledge in a unique situation, was enriching for many of the IMT members during the OSU-COVID-19 response. Observing and working with others in the OSU-IMT who have navigated the systems successfully will be a valuable resource for the organization in the future.

“When confronted with a challenge to help our state fight this virus, researchers and faculty from the main OSU campus in Stillwater and OSU Medicine in Tulsa focused their attention, collaborated across disciplines and thought innovatively to find a solution to accelerate testing in Oklahoma.”

OSU President Burns Hargis

SECTION VIII: RECOGNITIONS

OSU has made a substantial impact in the state of Oklahoma's fight against COVID-19. The successful outcome of the IMT mission would not have been possible without the many people who made it possible. This section, listed in no particular order, acknowledges the many departments, schools and individuals that enabled this accomplishment.

OSU Departments and Colleges

- College of Arts and Sciences, Air Force ROTC Detachment 670
- College of Education and Human Sciences (CEHS)
- College of Engineering, Architecture and Technology (CEAT)
- College of Veterinary Medicine (Vet Med)
- Edmon Low Library
- Oklahoma Animal Disease Diagnostic Laboratory (OADDL)
- OSU Department of Brand Management
- OSU Department of Public Safety (OSUPD)
- OSU Emergency Operations Center (EOC)
- OSU Environmental Health and Safety (EHS)
- OSU Housing and Residential Life
- OSU Medicine
- OSU Motor Pool
- OSU Research, Division of the Vice President for Research
- OSU Transit Services
- University Health Services (UHS)
- University Mailing Services

Specific Contributions

- Monica Roberts, the director of media relations, for liaising between the university and communication representatives from the governor's office and OSDH and for promoting the lab on a national scale.
- Allen Apblett from Chemistry for preparing saccharin solution for EHS Fit Testing.
- Bradley Barnes from College of Vet Med for all the IT help on multiple issues.
- Merry Bryson from College of Vet Med for VetView and portal assistance.
- Lynn Boorady from Design, Housing and Merchandising for making OSU facemasks for staff.
- Ellie Fuksa, Kayla Blaes and Tammy Austin from the Division of VPR for front office assistance and answering phones.
- Pratul Agarwal from the Division of VPR for data parsing from the referral lab.
- Tawni Hooten from the Division of VPR for affidavit assistance for results files.
- Darlene Hightower, Eric Maynard, Charlie Metzger, Kevin Ly Tang and Neo Zhang, from the Department of Information Technology, IT Security and Enterprise Operating Systems for creating a Data Management Program for handling referral lab results.
- Jeff Sweeden and Ron Tarbutton from Facilities Management for loaning the truck to move VetMed surplus, picnic tables and a trailer for storage.
- Gabe Dreiling from Janitor Services for providing extra cleaning at UHS.
- Tyrrell Conway from Microbiology for loaning his brand new freezer.
- Kyle Waters from OSU Athletics for providing ice for the sample coolers.
- Mike Melancon, Sarah Axtell and Cody Wehr from CEAT IT for setting up data entry workspaces, email access and the set-up and moving of labs to create workspace for the temporary workers.

- Julie Edmondson from OSU CEAT FPP who helped acquire coolers and a copier/scanner for ODL.
- Christa Louthan, Joey Keel and Keri Millard from HR for HR/Payroll functions.
- Kaitlin Little of the Brand Management web team for setting-up a web page for providers.
- Melissa Lindhorst from OSU IT - Software Services for IT support.
- Stephanie Powers, OSU CHS for courier coordination and serving as the initial front office for COVID-19 calls and emails.
- Barrett Hunter, OSU CHS Director of Compliance for HIPAA training assistance.
- Dr. Brad Rowland and the ENDEAVOR lab team for designing and manufacturing face masks.
- Dr. Hitesh Vora and Dr. Joe Conner, CEAT, for 3D printing tube racks for the lab.
- Dr. Hallenbeck, Dr. McClinton and all the personnel from Housing and Residential Life involved in the Continuity of Care initiative.
- Fire service training for collecting a fridge from Oklahoma City and driving overflow samples to Lubbock, Texas.
- The CEAT Marketing team for providing graphic design and writing support.
- OSU Facilities Maintenance for the trailer used for storage.
- ABM Industries (ABM) for the additional cleaning and sanitization.
- Justin Rees from TransLoc for the tracking devices used in the sample pickup vehicles.
- Alice Lieber, Ann Seeliger, Cheryl Foster, Cindy Mulburger, Gayla Schone, Martha Ray and Verna Culver who made cloth masks for the IMT operation.
- Spouses and families of all of those contributing to the COVID-19 response for their understanding of the long hours required during this stressful time.
- All the volunteers, and personnel working in and supporting the lab.
- The data entry personnel, intake volunteers and temporary hires.
- The many students and graduate students that were involved in the response.
- All the drivers that were willing to transport human samples for testing.
- All the personnel that served on the Incident Management Team.

Numerous people made countless contributions and many did so behind the scenes. Many of the contributions have not been included here due to the massive outpouring of support and activity that took place in a very short amount of time. Whether mentioned here or not, these valuable contributions have made a meaningful impression on OSU's response to reducing the negative impact from the COVID-19 global pandemic.

“On behalf of the Oklahoma State University family, thank you for your contribution to the Incident Management Team and its support of the diagnostic laboratory for COVID-19 testing. We appreciate your willingness to step forward and do your part. The teamwork and effort by all during these unprecedented times is a testament to each of you.

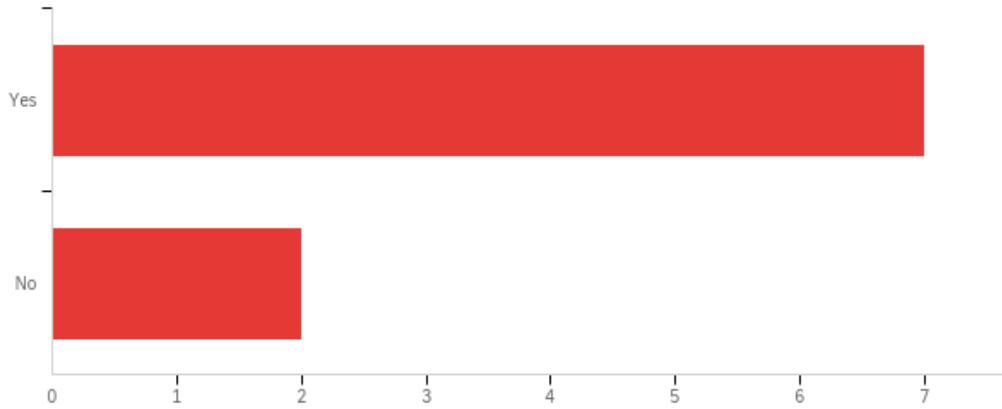
Thank you again for your hard work.”

OSU President Burns Hargis

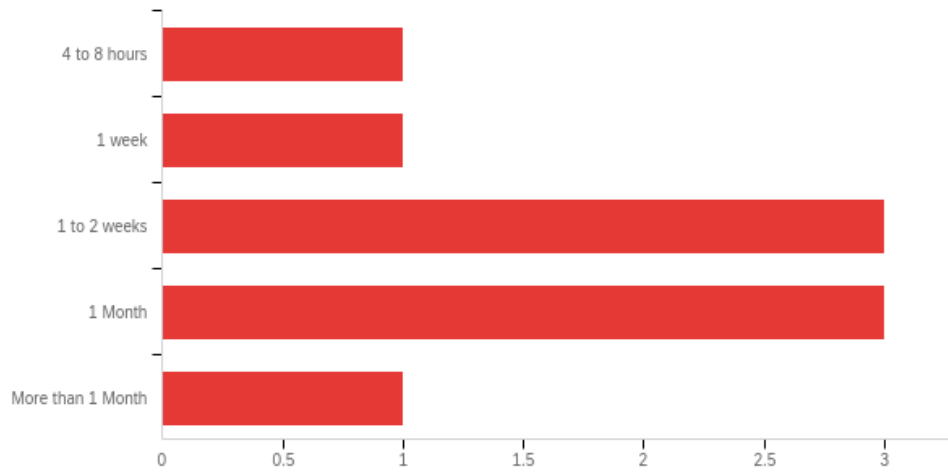
APPENDICES

Appendix A: Emergency Operations Center Survey Results

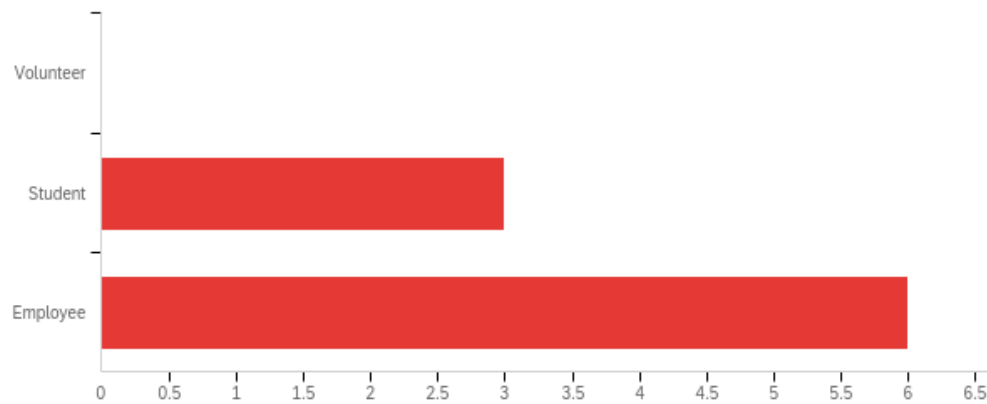
Did you work in the EOC during the OSU-OADDL COVID-19 event for at least 4 hours?



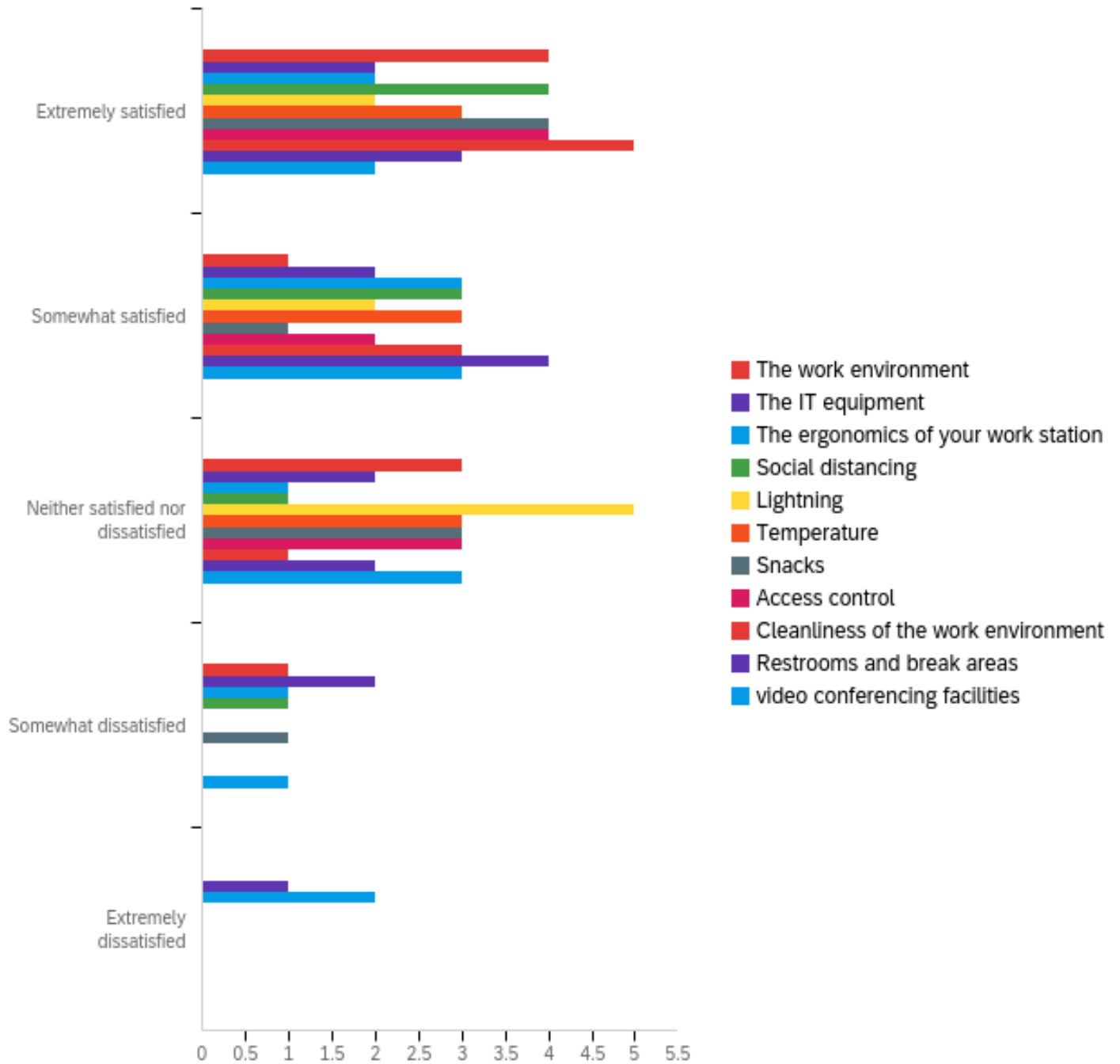
How long did you work in the EOC during the event?



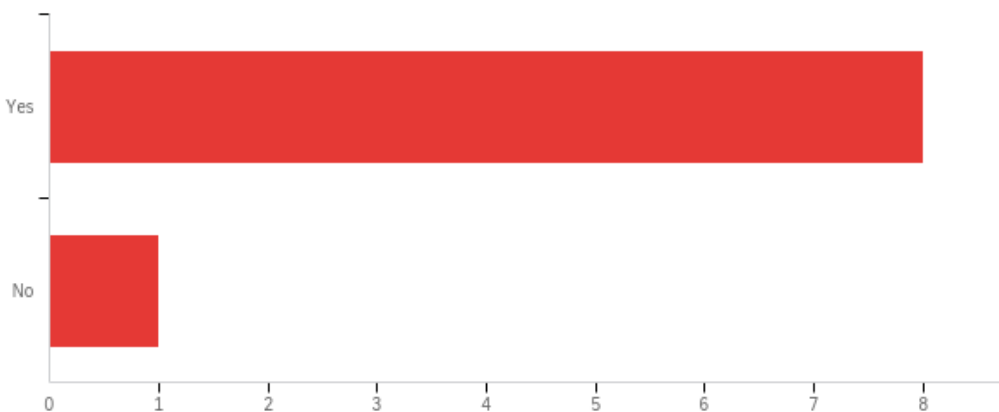
Were you a volunteer, student or assigned employee?



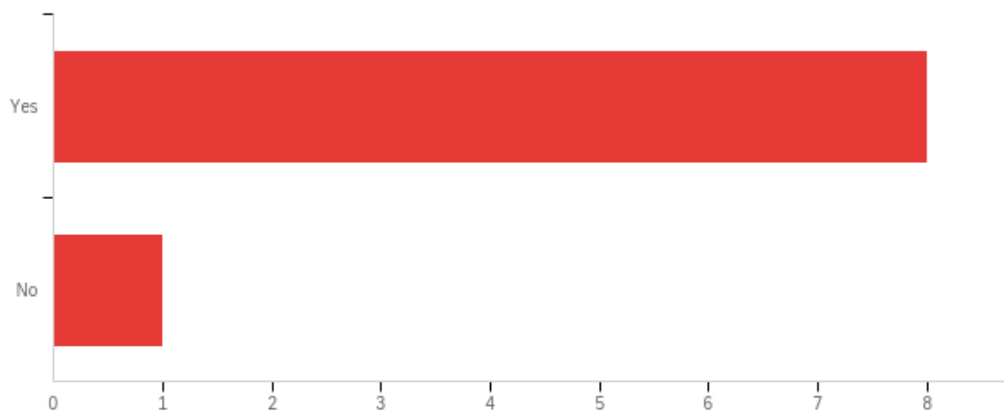
How satisfied or dissatisfied were you with:



Did you have access to the Software that you required to complete the task?



Did you have access to the resources you needed to do your assignment?



What resource(s) or software could the EOC add that would have made your assignment better?

Technology is very outdated and equipment needs to be replaced in order to meet modern usage demands.
Viewing access to the account
None come to mind
I had everything I needed.
Laptops with automatic WiFi built in. No sign in require.
Current IT and groupware technology. This is a critical facility and should have current capacity for networking, web access, and communication.
Was all ok
I'm not sure if it's possible, but WebIAP is a good program for putting together Incident Action Plans with easy to use and fill ICS forms, I've used it in the past with success.
Video Conferencing capabilities Better projection capabilities to help with social distancing Better work stations - the chairs are broken down and uncomfortable

Please give us some general comments about your experience in the EOC.

Overall, it was a positive experience. The only complaint would be the outdated technology.
Great facility should be used more. Need to come up with a better way to get in and out of the facility. I had a great time and learned a ton.
My only contact was with sample pickup and delivery to Lubbock Tx. My contact person, Tom kept me informed about delivery days / times and contacts at the Lubbock lab.
For long term use, it would be beneficial for workers to have key cards to not call in every time they need to enter.
Terrific job Dan and team. The support was always available and the use of the facility allowed the team to collaborate and work on operations, especially Planning and Operations.
The lighting in the central part of the EOC was not up enough, some corners were very dimly lit. The offices were nicely lit.
I enjoyed my time in the EOC, I wish I could've been there a little more often but the experience I did gain
I'll definitely use in my life and career going forward. I worked with some great people and I'm glad I got to assist with the incident response.
The OSU EOC is a very capable space and was utilized well during the response to the pandemic. The issues are that the space is out of date which provided for less efficiency.

Appendix B: IMT Staff List

The following personnel participated on the Incident Management Team

NAME	DEPARTMENT	POSITION
COMMAND STAFF		
Ed Kirtley	CEAT	Incident Commander
Dan Ray	OSUPD, EOC	Deputy Incident Commander; Planning Chief
Amy Dronberger	VPR	Liaison Officer
Chris Barlow	UHS, Administration	Liaison Officer
Shannon Rigsby	OSU Brand Management	Public Information Officer
Kristi Wheeler	CEAT, Marketing	Public Information Officer
Michael Galbraith	OSUPD, Tulsa	Safety Officer
Rob Agnew	CEAT, Faculty	Technical Specialist
Pam Stokes	UHS, Administration	Technical Specialist
GENERAL STAFF		
Operations Section		
Kim Southworth	EHS	Operations Section Chief
Tom Joyce	CEHS	Collection Branch Supervisor
Jessica Cottom	Edmon Low Library	Staffing Branch Supervisor
Meredith Hamilton	Integrative Biology, Faculty	Data Entry Branch Supervisor
Leon McClinton	Housing and Residential Life	Housing Branch Supervisor
Adam Queen	OSUPD	Security Branch Supervisor
Justin Kappenman	OSU Air Force ROTC	Collection Branch Assistant Supervisor
Jeanne Homer	CEAT, School of Architecture	Collection Branch
Nick Dumbauld	CEAT FPST, undergraduate student	Collection Branch
Jordan Ennis	CEAT FPST, undergraduate student	Collection Branch
Jake Mitchell	CEAT FPST, undergraduate student	Collection Branch
Karen Clark	OSU Child Development Laboratory employee	Collection Branch
Chad Tucker	OSU Facilities Management employee	Collection Branch
David Bales	Temporary employee	Collection Branch
Planning Section		
Tony McAleavy	CEAT, FEMP Faculty	Planning Section Chief
Rodney Eksteen	CEAT, FEMP Graduate Assistant	Deputy Planning Section Chief
Curtis Burns	OSUPD	Resource Unit Leader
Randy Seitsinger	CEAT	Daily COVID-19 tracking
Leslie Grotheer	OSUPD	Documentation Unit Leader
Dillon Harness	CEAT, FEMP Graduate Assistant	Documentation Specialist
Jeanette Burkhart	CEAT, FEMP Graduate Student	Documentation Specialist
Matt Burns	CEAT, FEMP Graduate Student	Documentation Specialist
Brandon Little	First Lieutenant, 38th Engineering Squadron, Tinker Air Force Base.	Documentation Specialist
Johnathan Chua	First Lieutenant, 38th Engineering Squadron, Tinker Air Force Base.	Resource Specialist

Logistics Section		
Patrick Wheeler	CEAT	Logistics Section Chief
Colt Chandler	OSUPD	Logistics Section Chief
Dustin Renner	EHS	Supply Unit Leader
Finance and Administration Section		
Caroline Reed	Fire Service Training	Section Chief
Jason Pogue	VPR	Section Chief
Craig Hannan	Fire Protection Publications	Deputy Section Chief
Shawna Goodwin	VPR, Fiscal Operations	Deputy Section Chief
Jason Pogue	VPR, Fiscal Operations	Cost Unit Leader
Misty Daniels	CEAT	HR Comp Claims Unit Leader
Vanessa Adair	FST	Buyer Clerk

The following personnel participated in the collection and transportation of samples as part of the Collection Branch:

OSU Motorpool and Transit supervisors
Steve Spradling, Tom Duncan and Derek Mooney.
Staff and students from the OSU Motor Pool, Transit, Parking and Tulsa shuttle
Beecher Owens, Bill Kepple, Bill Lowery, Brianna Warren, Chance Wallace, Chandler Williams, Courtney Waldron, Curtis Matthew Lewis, Daniel King, Dayton Campbell, Dennis Aziera, Dylan Hagan, Gary Fancher, Greg Gustafson, Haley Ceron, James Carr, Jay Doggett, John Minor, Julia Van Hoose, Kaiser Cleburn, Karen Venable, Kaytlynn Hood, Keith Webb, Kevin Olmstead, Kirrie Lobato, Kyle Crotty, Lane Hickerson, Levi Odom, Mark Larson, Matt Lewis, Paulina Gatica, Rhoda Holleman, Ryan Thomas, Sandy Guthrie, Stephen Paris, TC Chaimberlin, Timothy Baalman, Tom Williams, Tonya Ames, Tucker Reese, Willie Dayton Campbell, Levi Odom, Belita Dawes and Jonie Dawes

The following were responsible for the data entry as part of the Data Entry Branch:

Amber Brown, Becky Murray, Braden Sanzalone, Breanna Jacobitz, Brittany Blair, Camden Moses, Emerald Rice, Evan Hunt, Eve Nance, Gayle Sisney, Lezlee Cavanaugh, Tessa Martinez, Tiera Frank, Matt Stemm, Morgan West and Michelle Kuehn.

The following were responsible for processing the samples at ODL during the IMT operation:

Austin Leone, Carol Powers, Christian Ayala Ortiz, Darren Hagen, Denver La Force, Erika Artinger, Evan Hermann, Gabriel Cook, Heather Fahlenkamp, Jay Walton, Jen Grindstaff, John Gustafson, Josh Ramsey, Katie Jane Oswald, Liz Mccullagh, Mark Fishbein, Matthew Rochowski, Mostafa Elshahed, Rachel Hartnett, Rn Van Den Bussche, Ryan Koch, Scott Goepfner, Shuhao Yu, Viviana Freire Zapata and Dr. Yiwei Wang.

Appendix C: Demobilization and Transfer of Operations

Date/Time Transferred	Function/Task	Current Responsible Party	New Responsible Party
8 a.m. Monday, April 27	Hiring and processing of temporary employees, temp agency, salary support, EPAFs.	Jessica Cottom	<i>Carey Warner, Vet Med</i>
8 a.m. Monday, April 27	Scheduling of staff and data entry personnel for the lab.	Jessica Cottom	<i>Carey Warner, Vet Med</i>
8 a.m. Monday, April 27	Coordination of HIPPA training.	Kim Southworth	<i>Carey Warner, Vet Med</i>
8 a.m. Monday, April 27	Supervision of data entry clerks and data entry function.	Meredith Hamilton	<i>Meredith Hamilton, VPR</i>
8 a.m. Monday, April 27	Coordination of the use of the Engineering South computer lab.	Pat Wheeler	<i>Pat Wheeler, CEAT</i>
8 a.m. Monday, April 27	Ordering, inventory, and disbursement of PPE.	Dustin Reener	<i>Adam Queen, OSU PD/EOC</i>
8 a.m. Monday, April 27	On-boarding of lab support personnel.	Kim Southworth	<i>Kim Southworth, EHS</i>
8 a.m. Monday, April 27	Coordination of release of information.	Shannon Rigsby	<i>Shannon Rigsby, Brand Management</i>
8 a.m. Monday, April 27	Oversight of safety/health in lab.	Michael Galbraith/EHS	<i>EHS</i>
8 a.m. Monday, April 27	Financial and administrative recordkeeping.	Caroline Reed	<i>Jason Pogue, VPR</i>
8 a.m. Monday, April 27	Collection and delivery of samples to OADDL.	Tom Joyce	<i>Oklahoma Army National Guard</i>
8 a.m. Monday, April 27	Monitoring of collection and delivery of samples to OADDL.	Tom Joyce	<i>Curtis Burns, OSU PD/EOC</i>
8 a.m. Monday, April 27	Time and effort records of lab staff.	Amy Dronberger	<i>Ryan Van Fleet OADDL</i>
8 a.m. Monday, April 27	Coordination of facility support, waste management, food, lodging, etc.	Pat Wheeler	<i>Adam Queen, OSU PD/EOC</i>
8 a.m. Monday, April 27	Contingency planning for future scenarios.	Tony McAleavy	<i>EOC</i>
8 a.m. Monday, April 27	Disbursement of supply cache on termination of the operation.	Dustin Renner	<i>EOC</i>
8 a.m. Monday, April 27	Coordination of lodging with Res Life.	Dr. McClinton	<i>EOC</i>
8 a.m. Monday, April 27	Liaison with OADDL and the Office of the Vice President of Research.	Amy Dronberger	<i>Amy Dronberger, VPR</i>
8 a.m. Monday, April 27	Liaison with OEM & Pandemic Senior Advisory Group.	Dan Ray	<i>Dan Ray, OSU PD/EOC</i>
8 a.m. Monday, April 27	Coordination of support operations. IMT members stand down but remain available for support.	Ed Kirtley	<i>Dan Ray, OSU PD/EOC</i>

Appendix D: Informational Posters

COVID-19 health check procedure poster

The poster features a background of stylized, light-colored COVID-19 virus particles. At the top, the title "COVID-19 PROCEDURES" is written in large, bold, orange letters with a black outline. Below the title, the section "WHAT TO DO IF YOU ARE SICK" is introduced in orange text. It contains three steps, each with an icon: a crossed-out hand icon for Step 1, a thermometer icon for Step 2, and a plus sign in a circle for Step 3. The second section, "HOW TO SEEK MEDICAL ATTENTION", is also in orange text and includes a smartphone icon and a three-step list. The third section, "WHAT TO EXPECT", is in orange text and includes a stethoscope and flask icon with a curved arrow pointing from the stethoscope to the flask, and a four-step list. At the bottom, a bold black text block provides a warning about the OSU Diagnostic Laboratory.

COVID-19 PROCEDURES

WHAT TO DO IF YOU ARE SICK

 **Step 1** If you are sick, stay home and avoid contact with others.

 **Step 2** Monitor your symptoms. Common symptoms of COVID-19 are **fever** and **cough**.

 **Step 3** When to seek medical attention.

- 1 Trouble breathing
- 2 Persistent pain or pressure in chest
- 3 New confusion or inability to arouse
- 4 Bluish lips or face

HOW TO SEEK MEDICAL ATTENTION

 **1** Call your health care provider or the ER. Do NOT arrive to a health care facility without calling first.

2 Inform the healthcare provider of your symptoms.

3 The healthcare provider will instruct you on what to do.

If you have an emergency and need to call 911, let the dispatcher know your symptoms before first responders arrive.

WHAT TO EXPECT

 **1** Healthcare provider will screen you based on your symptoms.

2 If needed, a COVID-19 sampling (a nasal swab) is performed by a healthcare provider.

3 The sampling will be sent to the OSU Diagnostic Laboratory or an alternative diagnostic lab to determine a positive or negative result.

4 Results will be reported to your health care provider within a 24 hour period.

The OSU Diagnostic Laboratory is NOT a location to be sampled; it is a lab to process and test nasal swabs from patients who have been sampled at a health care provider or mobile test station.

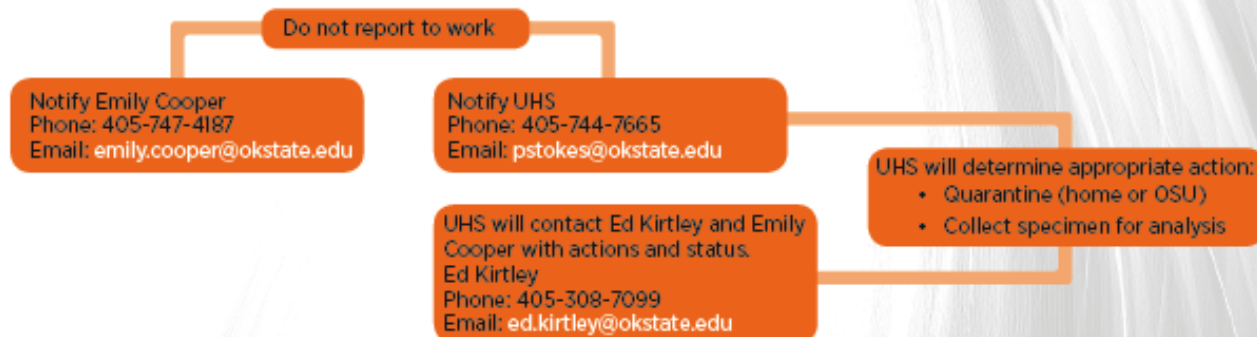


Exposure Reporting

If there is a suspected exposure, prompt reporting is vital. All OSU employees will be required to complete the Human Resources Workplace Injury Reporting Procedures. However, the first actions are identified below. They have been broken down into two categories: **home reporting** and **laboratory reporting**.

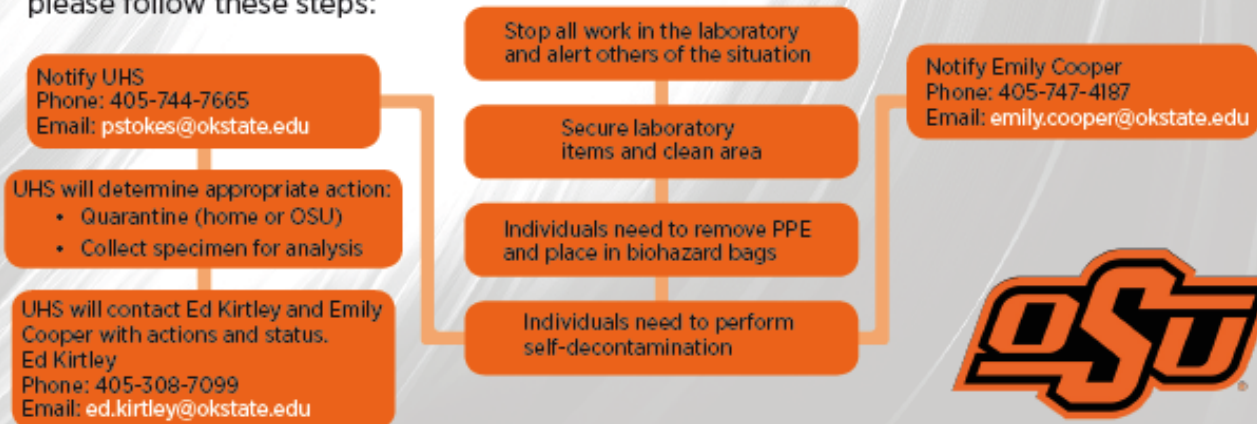
Home Reporting

Home Reporting: If symptoms (e.g. temperature greater than 100.4, dry cough, shortness of breath) are noted while conducting the required daily self-monitoring follow these steps:



Laboratory Reporting

Laboratory Reporting: If an accidental exposure occurs while working in the laboratory, please follow these steps:



Driver safety poster for OSU drivers collecting and transporting samples



While transporting samples, the potential exposure to COVID-19 is very minimal to zero to the drivers.

Drivers **MUST** ensure that the samples are packaged properly and not leaking **PRIOR** to accepting for transport. Drivers can minimize exposure by:

- Not touching samples
 - Only touching shipping containers that are in the proper overpack
 - Carefully place and secure overpacks in the vehicle for transport
 - If gloves are used, they should only be used once and changed at each location
 - Used gloves should be placed in proper disposal bags
- *See graphic for proper doffing of gloves



In the event of an automotive accident, break down, or a package begins to leak, the driver's priority is personal safety.

Once the safety of the driver is accomplished, notifications need to be made:

- No risk of injury or death to self or others – contact the EOC
- If there is a risk of injury or death to self or others – call 911 and EOC

Driver shall perform a daily self-monitoring check and note any symptoms listed below, prior to reporting to work:

- Fever (greater than 100.4)
- Cough
- Shortness of breath
- Sore throat
- Chest pain
- Flu like symptoms
- High stress levels

If any of these signs are noted, individuals should not report to work. Instead they should call UHS at 744-7665 for guidance.



Issued on 4/5/2020

Appendix E: Lab Survey Questions

OSU COVID-19 Testing Capabilities

As you may be aware, OSU has developed a COVID-19 testing facility to assist in the statewide efforts. At present, the current laboratory staff will handle the testing. However, if the testing ramps up statewide like we are anticipating, we may need to temporarily add person-power to the lab, in the form of faculty, staff, and graduate students from all over campus whose laboratory skills make them quickly Integrable.

Even though we do not know for sure if and when additional person-power will be needed, we need to coordinate the possibilities now. To assist the team in knowing who might be willing and able to fill this need, we have developed a brief questionnaire.

1. Would you have the time and willingness to contribute to the COVID-19 testing effort at OSU should your expertise match up with a need?
2. Are you in a group considered “vulnerable” to the COVID-19 virus (i.e. over the age of 65, current treatment that may render you immunocompromised, secondary health conditions)?
3. Do you live with, or care for, individuals who are considered vulnerable to COVID-19?
4. Are you currently experiencing (or have you experienced in the past 15 days) symptoms of a cold, the flu, fever, or respiratory problems (other than mild seasonal allergies)?
5. Do you live with, or care for, individuals who are currently experiencing (or have you experienced in the past 15 days) symptoms of a cold, the flu, fever, or respiratory problems (other than mild seasonal allergies)?
6. Briefly describe the skills you possess and the experience you have that would be related to COVID-19 testing (DNA/RNA isolation, PCR/qPCR operation, handling pathogenic samples, etc.).
7. How many years of experience do you have with these skills?
8. In what laboratories have you utilized these skills (include both at OSU or other locations)?
9. If you would be willing to be contacted by the OSU COVID-19 Testing Logistics Response Team about possible integration into the effort, please complete the section below:
10. Due to labor requirements, please indicate if you are an American citizen?

Appendix F: Sample Collection and Mileage Log

Total Mileage and Samples Collected (06-17APR)

Route	Vehicle Number	Starting Mileage	Ending Mileage	Total Mileage	Total Samples per site
1 - Woodward	63	29525	32340	2815	304
2 - Logan	16	17414	18452	1038	575
3 - Payne	58	27364	27474	110	777
4 - Rogers	37	23149	25088	1939	1005
5 - Comanche	91	17416	20486	3070	552
6 - Cleveland	69	14064	15849	1785	1114
7 - Muskogee	100	15770	18161	2391	481
8 - Carter	66	18545	21835	3290	429
9 - Pittsburg	36	25608	28799	3191	328
Reserve	92	15509	15847	338	-
			Total	19967	5565

Total samples collected and mileage travelled by OSU drivers per Oklahoma State Department of Health district between 04/06/2020 and 04/17/2020.

Appendix G: Costs

All costs associated with the operation up until April 30 are included in the financial statement below:

FINANCIAL STATEMENT FOR ACCOUNT 1-113305

Reconciled through April 30, 2020

TITLE: VPR Emergency Response

Agency:	Oklahoma State University	Report Date:	5/6/2020
Incident Name:	OSU-COVID-19-OADDL	Incident #:	DR EM-3462
Start Date:	3/1/2020	End Date:	TBD

REVENUE	Through 30-Apr-20	Open Commitments	Total
OSDH Testing Fee	\$	\$ 1,550,000.00	\$ 1,550,000.00 <i>*Note 1</i>
Total Revenue	\$	\$ 1,550,000.00	\$ 1,550,000.00

EXPENSES	Through 30-Apr-20	Open Commitments	Total
Salaries (through 6-30-20)	\$24,567.31	\$66,504.00	\$91,071.31
Benefits (through 6-30-20)	\$9,891.45	\$18,658.16	\$28,549.61
Materials/Supplies	\$ 670.90	\$ (2,360.19)	\$(1,689.29)
Lab Supplies	\$691,730.65	\$3,756,743.89	\$4,448,474.54
Lab Equipment	\$173,636.35	\$34,592.89	\$208,229.24
Software/IT Supplies	-	-	-
Software/IT Equipment	\$1,399.98	-	\$1,399.98
Travel	\$10,403.76	-	\$10,403.76
Communications	\$259.45	-	\$259.45
Printing/Copying	-	-	-
Equip Repairs/Maint	-	\$5,427.00	\$5,427.00
Test/Prof Services	\$303,606.98	\$179,290.28	\$482,897.26
Other Expenses	\$ 5,034.50	\$19,568.34	\$24,602.84
Total Expenses	\$ 1,221,201.33	\$ 4,078,424.37	\$ 5,299,625.70
Balance	\$ (1,221,201.33)	\$ (2,528,424.37)	\$ (3,749,625.70)
Increase in OADDL Utilities	-	-	- <i>*Note 2</i>
Cost Share/Matching	\$ 302,054.32	-	\$ 302,054.32 <i>*Note 3</i>

**Note 1:* Revenue will be deposited into 1-160110 and distributed as needed.

**Note 2:* This figure will represent the estimated increased utility costs at OADDL due to testing

**Note 3:* Salary and Fringe paid on other departmental accounts, and not directly on the VPR account



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