



Global Center for Health Security
ANNUAL REPORT
2020

Mission

Innovate and advance preparedness and response for emerging infectious diseases and catastrophic public health emergencies. Build capacity and capability for clinical operations for health security leveraging research, education and training, and technical performance. Enable twenty-first century care for emergencies and low-resource environments.

Vision

Lead the world in preparedness for "Disease X" (novel and emerging pandemic diseases) and health security threats.

Values



Agile & Flexible



Operationally Focused



Collaborative



Innovative



Altruistic



Courageous

Funding

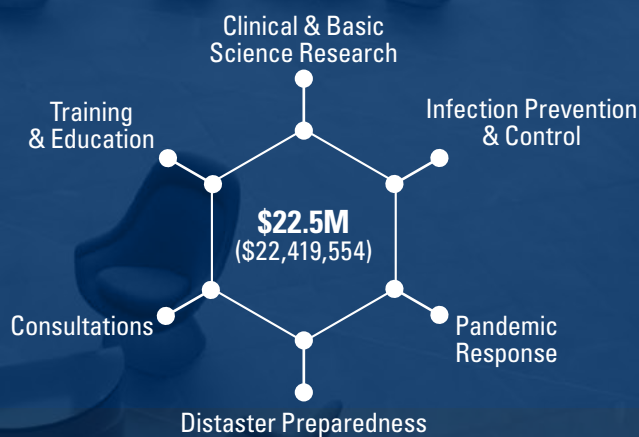
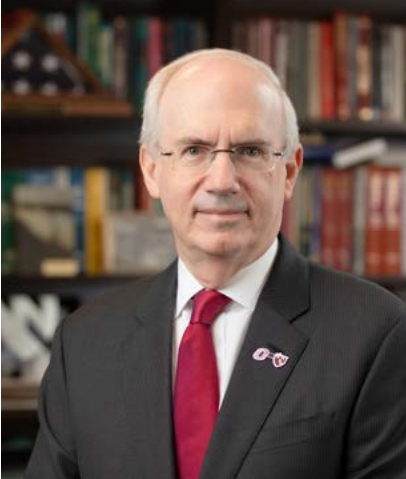


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Message from Chancellor Gold



Jeffrey P. Gold
Chancellor, University of Nebraska Medical Center

As a global resource with a mission to innovate and advance preparedness and response in emerging infectious diseases and catastrophic public health emergencies, the Global Center for Health Security (GCHS) immediately began to prepare to enact its biopreparedness response strategies when learning of the novel coronavirus in China.

In early January, when contacted by the U.S. Department of Health and Human Services Assistant Secretary for Prevention and Response to provide isolation and quarantine assistance, the GCHS immediately moved to assist. In collaboration with federal and state partners, the GCHS arranged for housing at Camp Ashland while providing all logistical and medical support to Americans returning from Wuhan, China. Soon after, the GCHS opened the National Quarantine Unit for its first guests — travelers stranded in quarantine aboard cruise ships. Seizing the opportunity to perform the first of many innovative COVID-related research programs in real time, the GCHS team was able to provide the medical community with one of the first findings of aerosol transmission.

After the federal response for the repatriated Americans from Wuhan and the Diamond Princess passengers successfully ended, the GCHS team moved to focus on state issues of concern. By facilitating communications between state, local, and private organizations, the GCHS supported Nebraska communities' challenges. Infection and prevention control experts traveled the state visiting various industries to provide guidance on how to best mitigate the spread of the virus in the workplace. Playbooks of best practices were compiled from these visits and made freely available online. Throughout the federal and local response, the GCHS continued providing formal COVID-19 training for federal and public health care workers.

By being adaptive, innovative, and collaborative, the GCHS is truly a global leader in biopreparedness and public health emergency response, but it is the dedication GCHS displays for its mission that ensures our state and nation will receive an immediate and effective response to its critical needs whenever the opportunity arises. A highly respected resource and a national treasure.

Sincerely,

Jeffrey P. Gold, MD
Chancellor, University of Nebraska Medical Center



The first group of 57 Americans arrive from China to be watched for 14 days at Camp Ashland. (Photo courtesy of the U.S. Department of Health and Human Services)

At the Vanguard of COVID-19 Response: Quarantine of Wuhan Evacuees

Not long after its official opening in October 2019, the National Quarantine Unit (NQU) received an opportunity to put Nebraska front and center in the fight against an emerging viral disease once again.

On January 28, 2020, the U.S. Department of Health and Human Services Assistant Secretary for Preparedness and Response (HHS/ASPR) and the U.S. Centers for Disease Control and Prevention (CDC) formally requested that UNMC/Nebraska Medicine provide quarantine services for American citizens being evacuated from Wuhan, China — the original epicenter of the COVID-19 pandemic. UNMC/Nebraska Medicine was among the five sites chosen by the federal government for this emergency mission. At that time in the pandemic, only a week after the first case was detected in the U.S., the dangers of COVID-19 transmission and disease were still largely unknown. Although screened for disease and asymptomatic, these repatriated Americans were thought to be a significant risk for importing COVID-19. The fact that the NQU/GCHS team was the only civilian center asked to provide quarantine care reflects the high level of confidence national leadership places in the GCHS.

After coordinating with state and local officials to secure the Nebraska National Guard Training Center at Camp Ashland as the quarantine site, the GCHS leadership quickly turned its attention to the logistics of housing 57 Americans en route from Wuhan who were at high risk for COVID-19. By managing the safe and efficient provision of food service, housekeeping, technology support, lodging, facility maintenance, transportation, emergency medical support, and terminal cleaning, GCHS ensured that Camp Ashland was fully prepared to safely receive and quarantine the repatriated Americans. On campus at UNMC, a federal operations response center was established in the Davis Global Center, with the GCHS team providing technical assistance, administrative support, and subject matter expertise for more than 70 officers from ASPR, CDC, the National Disaster Medical System, and the U.S. Marshals Service who were engaged in the quarantine effort.



GCHS executives watch as the first group of Americans to arrive from China to be watched for 14 days at Camp Ashland. (Photo courtesy of the U.S. Department of Health and Human Services)

On February 7, 2020, the Americans arrived from Wuhan at Omaha's Eppley Airfield, where they were screened by CDC quarantine officers and transported to Camp Ashland. By all accounts, their stay at Camp Ashland was well-received and uneventful. One person developed minor respiratory symptoms and was transported to the NQU for observation and medical care from our highly trained healthcare team; after receiving two negative coronavirus tests, the individual returned to Camp Ashland for the remainder of the quarantine period. On February 20, all 57 Americans departed Omaha having successfully completed their quarantine requirement, many expressing their gratitude for the professionalism, attentiveness, and compassion shown by our team.



Working with UNMC and the Global Center for Health Security on the early COVID-19 response has been the public health highlight of my career. Providing for U.S. citizens returning home from overseas and caring for individuals affected with COVID-19 is a testimony to the vital, yet often invisible, task of being prepared. UNMC and the Global Center for Health Security led the nation — demonstrating what it means to provide serious medicine and extraordinary care in uncertain times.

CAPT Dana L. Hall,
U.S. Public Health Service, HHS/ASPR
Regional Emergency Coordinator

U.S. Government Turns to Nebraska Again for Isolation and Quarantine of Diamond Princess Cruise Passengers

Only four months after the October 2019 completion of the National Quarantine Unit (NQU) and shortly following the Wuhan evacuees' quarantine, the NQU team was mobilized again to receive and care for American passengers rescued from the Diamond Princess cruise ship, docked in Yokohama, Japan, with multiple documented cases of COVID-19 on board.

Within days of the ship's docking, GCHS Executive Director of International Programs and Innovation, James Lawler, MD, received a request from HHS/ASPR to board the Diamond Princess to evaluate the ship's conditions and passengers. After Dr. Lawler and the HHS response team assessed the situation on board and spoke with passengers, crew, and local officers, more than 300 American passengers were returned to the U.S. as quickly as possible to be appropriately quarantined and, if necessary, isolated at a location where they would be able to receive the best medical treatment available should they develop severe illness.

In coordination with the HHS/ASPR, an evacuation was planned, and Dr. Lawler escorted half of the passengers back to the U.S. on a converted cargo aircraft. HHS/ASPR determined that UNMC was the best possible destination for the known COVID-positive cases to receive optimal care, and on February 17, 2020, these passengers arrived at the country's only federally funded, state-of-the-art National Quarantine Unit. Two additional passengers arrived soon after — of the 15 passengers, 13 tested positive for COVID-19. Passengers who experienced worsening symptoms or had complicating factors were transferred to the Nebraska Biocontainment Unit at Nebraska Medicine, as needed.



There's really no better place in the country, maybe in the world, for them to be. We have a staff that has trained for 15 years to deal with highly hazardous infectious diseases."

Dr. James V. Lawler

At the press conference following the release, Jeri Seratti-Goldman, left, complimented the doctors and staff of the National Quarantine Unit by saying, "This has been an amazing experience; this place is special, and you should be proud." Joanne Kirkland, right, agreed saying, "We have been treated with respect."



UNMC Chancellor Jeffrey Gold, MD, right, elbow bumps with Joanne Kirkland, left, and Jeri Seratti-Goldman, center, after they were released from the National Quarantine Unit on the UNMC campus.

While the care from the NQU and NBU teams was top-notch, as expected, the caring from the UNMC/ Nebraska Medicine and Omaha communities at large was remarkable. From get-well cards to catered steak dinners and all manners of donated personal care and comfort accessories, Nebraskans embraced their role to provide refuge and healing for these wayward passengers. One by one, our guests resolved their illness, cleared virus testing, and were sent back to their homes. Finally, after more than 40 days, the last of the Diamond Princess guests were released, just as the hospital began to receive local cases in earnest.



Angela Vasa, MSN, RN, director of quarantine services, prepares to give an update to media regarding quarantined travelers staying in the NQU.

It's gratifying to be able to play such a crucial role at such an important time as this disease continues to spread across our nation. Providing care and monitoring for these Americans in the Nebraska Biocontainment Unit and National Quarantine Unit is not only integral to the safety of our country but also incredibly important as we study more about this disease and the best approaches for diagnosis and treatment across our nation and beyond. Nebraskans should be proud that we have the best people, the best technology, and best facilities here to be able to tackle this mission head on.

Dr. Jeffrey P. Gold,
UNMC Chancellor



Training, Simulation, and Quarantine Center and the National Quarantine Unit Officially Opens in the Dr. Edwin G. & Dorothy Balbach Davis Global Center

In October 2019, the Dr. Edwin G. & Dorothy Balbach Davis Global Center officially opened its doors with the launch of the new Training, Simulation and Quarantine Center (TSQC) and the 20-bed National Quarantine Unit (NQU). This new facility allowed GCHS to further integrate our resources and expand education and training opportunities. Funded with a \$20 million grant from HHS/ASPR, the TSQC is home to the most advanced experiential equipment and programming available for training federal and public healthcare personnel, and the NQU provides unmatched quarantine monitoring and care for those exposed to high-consequence pathogens.

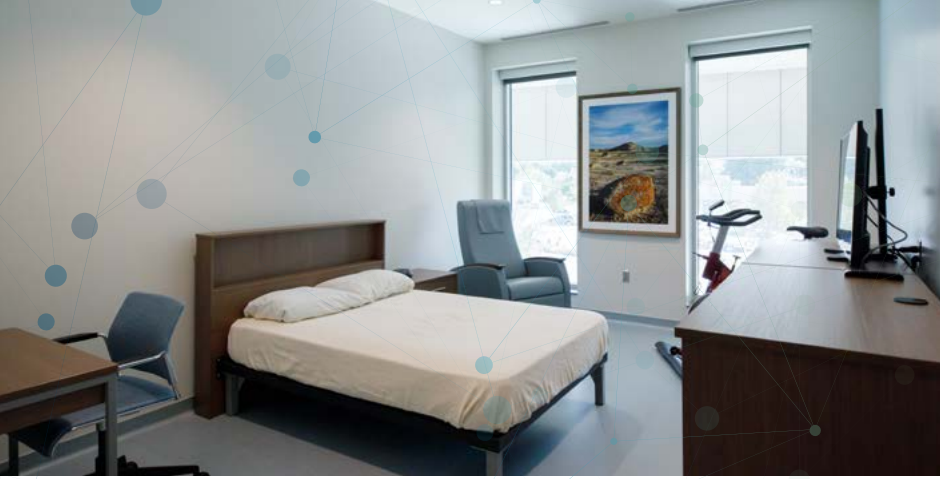
Training, Simulation, and Quarantine Center

Experiential learning at the TSQC takes place in arguably the most sophisticated patient biocontainment training unit in the country, and this, combined with our cadre of experienced instructors, allow students to enjoy unmatched training opportunities. Students learn-by-doing in six fully simulated patient rooms, each with its own high-fidelity mannequin and adjacent briefing room for pre- and post-simulation instructional review. All six rooms are viewable and operated from a central control room that has full audiovisual capability for instructors. The center also contains a fully functioning simulated biocontainment laboratory and an emergency operations center for simulating exercises in managing a large-scale response to a biological event.

In November 2019, the TSQC enrolled its first students; Nebraska once again leading the way for managing high

consequence infections. Within two months, however, the COVID-19 pandemic emerged in Wuhan, China, and the TSQC activated the NQU while temporarily suspending in-person training activities. Recognizing the need to provide training related to the care of individuals with SARS-CoV-2, the TSQC pivoted classes to an online, virtual learning environment.

The TSQC has designed and implemented three core training programs that are commissioned by HHS/ASPR for National Disaster Medical System (NDMS) and U.S. Public Health Service (USPHS) personnel — the Isolation, Simulation, and Quarantine program, the Infectious Disease Transport program, and the Infectious Disease Mortuary Care program. Leveraging new cutting-edge facilities and simulation equipment, these occupation-specific training modules instruct deployable rapid response teams and/or hospital-based teams how to quickly, safely, and effectively manage high-consequence infection



Negative pressure guest room in the National Quarantine Unit

situations. Our programs have been extremely well-received, and our graduates share that their confidence in their ability to handle hazardous communicable diseases in any possible environment has risen considerably.

While each program has learning objectives that reflect the unique characteristics of the specific profession involved (patient care, transportation, and mortuary care), all three programs include advanced coursework in the TSQC's large, high-tech classroom. Students in each program receive in-depth education and training on job-specific fundamentals of infection control protocols and techniques, such as the proper handling of hazardous waste and cleaning up spills, learning how to manage transporting infectious patients (e.g. how to prepare and decontaminate an ambulance), proper PPE use (e.g. safely donning and doffing and ensuring the correct PPE is being used for the correct application), and perhaps most importantly, risk assessment and management for high-consequence infectious agents.

On March 27, 2020, the COVID-19 Mission Prep virtual training was launched in response to the pandemic and includes interactive e-learning modules, videos, narrated PowerPoints, and visualization content on donning/doffing PPE, nasopharyngeal swab collection procedures, transmission-based precautions, COVID-19 overview, and deployment readiness, among other topics.

National Quarantine Unit

The NQU at UNMC/GCHS is the only federally funded resource of its kind; it is specifically designed to provide first-class quarantine and isolation care to individuals exposed to highly hazardous communicable diseases. Its 20 rooms employ individual negative air pressure systems, are single occupancy with en suite bathroom facilities, and contain exercise equipment and Wifi connectivity for patients requiring longer stays.

The NQU's all-volunteer team is comprised of highly skilled nurses, physicians, and allied health professionals who complete quarterly training in specialized infection prevention and control processes as well as participate in exercises and drills. They are committed to maintaining the advanced skills necessary for attending to the unique needs of individuals requiring admittance to the NQU or the adjacent Regional Emerging Special Pathogen Treatment Center (RESPTC) housed at Nebraska Medicine.



20

National Disaster Medical System

in-person courses (400 learners)



3

Pilot Courses

on Isolation Simulation and Quarantine for National Disaster Medical System



Training

1,744 **400**

participated in
COVID-19
virtual training

participated in
on-site
ISQ training

Infectious Disease Transport and Mortuary Workshops

8

countries
participated

17

U.S. agencies
contributed



SITE VISITS

14

Meat Processing

1

Dairy Processing

11 technical assistance calls

82

Long-term Care Facilities

10

Shelters

6 technical assistance calls

2

Correctional Facilities

3 technical assistance calls

GCHS Comes to the Aid of Nebraskans: Supporting Community-Based Response to COVID-19

Infectious disease and infection prevention and control (IPC) experts from the GCHS have been a tremendous source of support for local and state-wide businesses and organizations during the COVID-19 pandemic. We have developed guidelines and provided technical assistance to numerous industries and community partners since the earliest days of the pandemic and continue to help our fellow Nebraskans in a variety of ways.

Several industries were heavily impacted by COVID-19, often due to high density of workers or residents representing particularly vulnerable populations. These included the meat processing industry, correctional facilities, shelters, and schools. Long-term care facilities were also acutely affected; the GCHS and Region VII Disaster Health Response Ecosystem (RDHRS) teams also worked closely with these facilities across the state in partnership with the Infection Control Assessment and Promotion Program (ICAP) and National Emerging Special Pathogen Training and Education Center (NETEC).

GCHS leadership conducted on-site technical assistance visits with many local and state organizations and businesses, often partnering with RDHRS team members, and worked closely with each to develop the best plan to protect the workforce and mitigate community spread. By first meeting with and listening to employers about their challenges and concerns, the GCHS then tailored discussions and recommendations to the unique characteristics and constraints (e.g. layout or population) of each facility. Initial meetings were followed by a site tour to identify personnel workflow, existing

implemented measures, and physical spacing constraints. The GCHS team then debriefed with facility leadership and reviewed additional risk mitigation measures that could be implemented. We provided publicly available resources that could assist leadership in educating their workforce and offered ongoing support as needed.

In response to numerous requests, the GCHS also compiled best practices and risk mitigation strategies to create industry-specific COVID-19 playbooks with assistance from the UNMC College of Public Health and Central States Center for Agricultural Safety and Health. Playbooks for meat processing facilities, long-term care facilities, K-12 schools, court systems, higher education, and child development centers are available on the GCHS website for the public to freely download and share. On occasions when community members reached out for clarification over national guidelines, such as how to navigate holidays or safely attend school events, GCHS posted clear and accessible information accompanied by examples from everyday situations.

As the COVID-19 pandemic progresses and essential industries, schools, and community organizations continue operating or returning to work, the GCHS stands ready to support and extend outreach to these facilities and organizations to mitigate COVID-19 risks and promote the health and safety of individuals in the local community, state, and across the



Addressing Ethical Issues in a Global Pandemic

The GCHS Ethics Advisory Committee was established in the early stages of the COVID-19 outbreak to serve as a resource for those facing unprecedented ethical issues. The committee was organized by UNMC Director of Ethics and Public Health Preparedness, Abigail Lowe, and it is chaired by Director of the Center for Bioethics and Humanities, Matthew Wynia, MD, from the University of Colorado Anschutz Medical Campus. Its membership represents a breadth of expertise in disaster and public health emergency ethics, both nationally and internationally.

Initially, much of the committee's work focused on supporting ethics requests regarding crisis standards of care — helping healthcare institutions analyze and resolve difficult ethical issues occurring in the planning phase prior to moving into crisis standards of care. Since then, the committee's work has extended to include key bioethics issues within research, clinical, and public health matters.

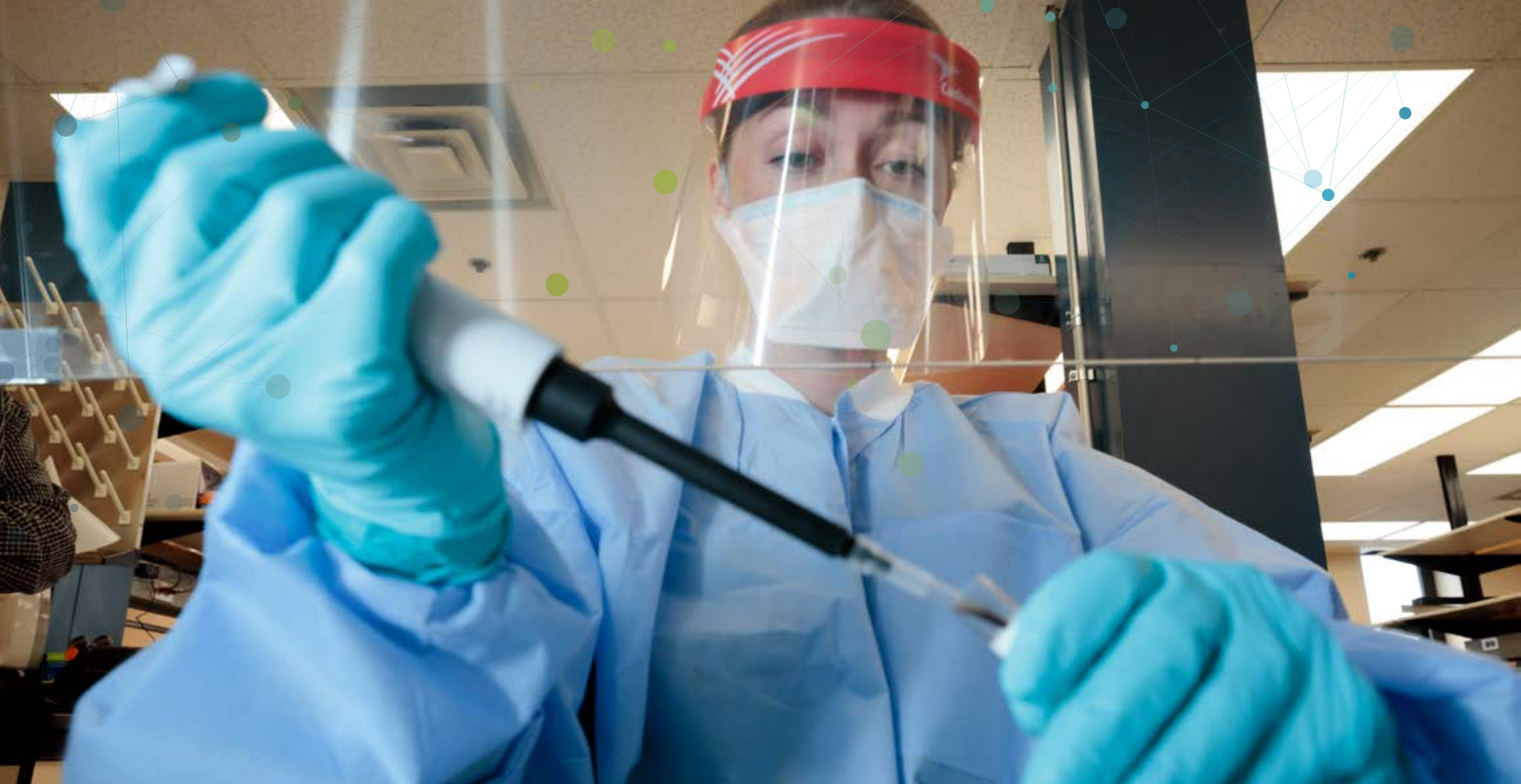
Ethics requests are received through the GCHS website and from word of mouth. To date, the Ethics Advisory Committee has received requests from across the United States on the following topics:

- Crisis standards of care, triage planning
- Infection prevention and control in meat processing plants
- Personal protective equipment (PPE) and federal regulations
- Allocation of PPE as training supplies to first responders
- Reopening schools
- Guidelines for risk communication
- Contact tracing in the workplace



In May 2020, the committee received funding from the National Institute of Environmental Health Sciences (NIEHS) to host a series of webinars on the ethical considerations around COVID-19 in the workplace ranging from infection prevention and control measures to guidance with regard to contact tracing. The series opened up the ethics requests to NIEHS grantees grappling with the protection of workers in essential industries impacted by COVID-19.

When an ethics request can be answered with relative ease, the committee promptly provides written guidance. However, some issues required more research and discussion in order to provide a comprehensive response. As a result of these instances, the Ethics Advisory Committee has produced a consultation report, as well as infographics, published on the GCHS website. This allows the committee to rapidly publish and disseminate guidance on high-impact issues.



Dr. Jana Broadhurst pipetting a blood sample for COVID-19 research

Innovating Through Research and Development

During the past year, the GCHS team has partnered with many academic groups at UNMC and external partners to tackle the most pressing problems in emerging infectious diseases. Critical research in the fight against COVID-19 was naturally a major focus this year, but many other studies of importance have also underscored the innovative, progressive approach that is truly at the heart of every GCHS project. Below are several examples of our most exciting and pioneering research projects.

As the Diamond Princess cruise ship passengers were settling into the NQU in February 2020, a team led by Josh Santarpia, PhD and John Lowe, PhD was already thinking ahead to the possibility of airborne transmission. By investigating the presence of SARS-CoV-2 in the environment of the NQU, the team discovered widespread contamination through both aerosol and surface testing, suggesting the **Aerosol and Surface Transmission Potential of SARS-CoV-2** and that care teams should utilize airborne isolation precautions when caring for COVID-19 patients.

The **Nebraska Drug Development Pipeline (NDDP)** has advanced as one of University of Nebraska's "Big Idea" projects thanks to its partnership with SAb Biotherapeutics, a small biotech company in Sioux Falls, South Dakota, to develop novel antibody-based therapeutics to fight the COVID-19 pandemic. The enabling technology produces human antibodies from cows that can then be used to treat patients infected with SARS-CoV-2, similar to the therapeutic use of convalescent plasma. The NDDP is also helping the U.S. government develop drugs that prevent and/or mitigate the effects of radiation exposure.

UNMC/Nebraska Medicine was the first site in the U.S. to enroll patients in the NIH-led **COVID-19 treatment trial** to determine if the use of remdesivir in hospitalized COVID-19 patients improved their outcomes. While this trial originated at UNMC/Nebraska Medicine, due to the **Special Pathogens Research Network (SPRN)** and a rapid enrollment process, this trial quickly expanded to 47 states and 21 countries. Andre Kalil, MD, the study's principle investigator, was pleased that the data showed the patients treated with remdesivir had a 31% faster recovery time than those receiving a placebo.

In response to the perilous shortage of N-95 respirators in the spring, Dr. Lowe led a team to create a process to **decontaminate PPE using ultraviolet light** during the height of the COVID-19 pandemic. The process — the first of its kind to implement on a large scale — involved collecting N-95 respirators at the end of each shift and utilizing ultraviolet light towers to decontaminate the masks and return them to hospital staff for re-use. This creative solution helped preserve a critical resource and allowed UNMC to maintain airborne precautions for its healthcare workers throughout the spring wave. As Dr.

Lowé noted, “The pandemic has forced us to be as innovative as possible in filling gaps and responding to new challenges.”

Led by the Director of UNMC Emerging Pathogens Laboratory, Jana Broadhurst, MD, PhD, and her team, UNMC was one of the first clinical laboratories in the U.S. to develop its own **PCR diagnostic test for SARS-CoV-2 detection** to support repatriated Americans in the NQU and Nebraska Biocontainment Unit before public health or commercial tests were available. The test received emergency use authorization from the FDA, continues to support patient care at Nebraska Medicine and the surrounding community, and serves as a gold standard for the evaluation of novel diagnostic technologies.

Recognizing the critical need for innovation in infection prevention and control for COVID-19, James Lawler, MD, Dr. Broadhurst, and David Brett-Major, MD, accelerated an existing GCHS project called the **Isolation System for Treatment and Agile Response for high-risk Infections (ISTARI)**, a modular structure that can be used to care for patients who are highly contagious. ISTARI, based on an earlier iteration developed for Ebola, is a disposable structure that fits inside a standard hospital room and dramatically reduces the need for PPE by, in essence, wrapping the PPE around the patient instead of the healthcare worker. The latest prototype is being tested and improved per our team’s recommendations and will be sent to community hospitals for additional testing and vetting. ISTARI is low cost, portable, lightweight, and requires minimal training, making it ideal for small communities.

Drs. Brett-Major and Broadhurst established the first COVID-19 patient cohort and specimen bank in the U.S. under the **Clinical Characterization Protocol for Severe Emerging Infections (CCPSEI)**. This in-depth prospective study of the clinical features of COVID-19 will lead to a better, more comprehensive understanding of the disease. Working together with specialty groups across UNMC/Nebraska Medicine, the CCPSEI study has facilitated diverse COVID-19 clinical research efforts interrogating risk factors, pathophysiology, diagnosis, transmission, and host response. De-identified data from the CCPSEI study is made publicly available in real time.

The **Pandemic Recovery Acceleration Model (PRAM)**, an interactive data display was developed under the leadership of UNMC Chancellor, Dr. Jeffrey Gold, in collaboration with GCHS executive leaders to illustrate essential elements of information related to disease transmission and hospital resources in a consolidated, integrated Tableau dashboard. This dashboard has been instrumental to Nebraska coalitions and public health jurisdictions in identifying early changes in trends of COVID-19.



UV light decontamination process developed to reuse N95 masks



ISTARI, a low-cost, mobile, modular structure that drastically reduces PPE needs.

The GCHS PRAM Index Pandemic Recovery Acceleration Model





NETEC MISSION:

To increase the capability of United States public health and healthcare systems to safely and effectively manage individuals with suspected and confirmed special pathogens.

NETEC Beyond Ebola: Leading National COVID-19 Pandemic Response

Our ambition to mount the best possible response to novel, emerging infectious diseases requires persistent innovation and an action-oriented mentality. Harnessing the aligned missions, shared visions, and complementary strengths of our valued partners, the GCHS continues to advance the goalposts for success, leveraging the best possible resources in the country to lead the world in preparedness for public health emergencies.

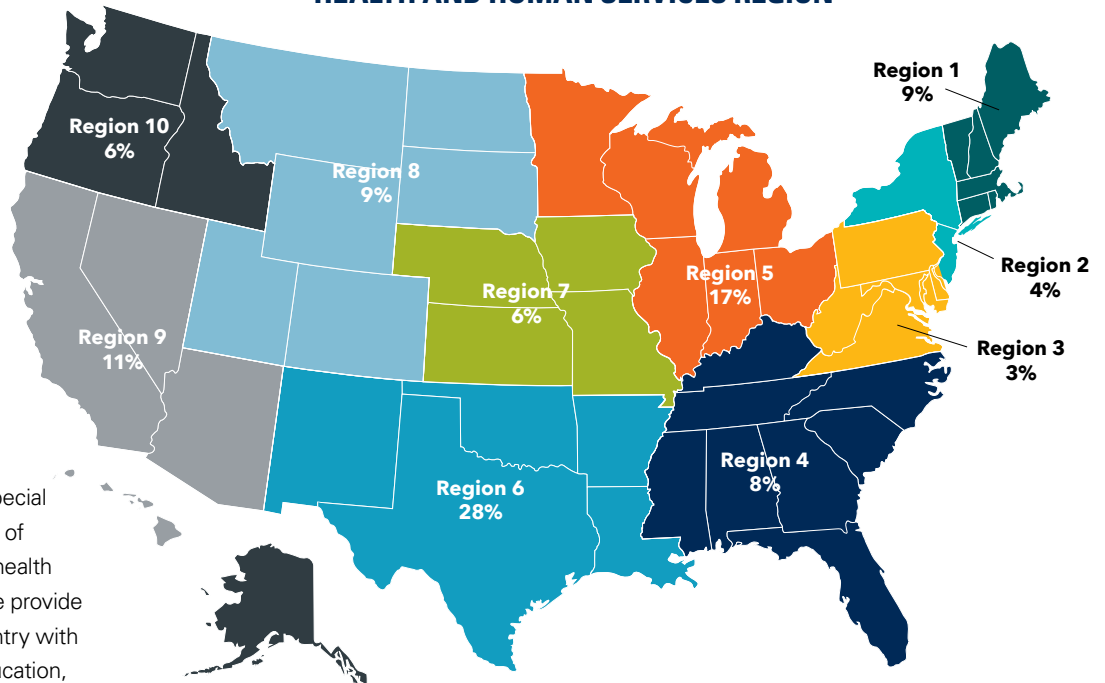
The National Emerging Special Pathogen Training and Education Center (NETEC), formed in 2016, is a consortium of three institutions — Emory University, the New York City Health and Hospitals Corporation, and the University of Nebraska Medical Center — whose faculty and staff represent the gold standard for treating patients with high-consequence pathogens, including COVID-19. Every project within NETEC increases the competency of allied health workers to deliver safe, efficient, and effective special pathogen patient care.



NETEC has advanced the U.S. health system capability during the COVID-19 pandemic with robust response efforts that include the following:

- ✓ **Initiated remdesivir ACCT1 trial in 72 hours** at 10 Special Pathogen Research Network (SPRN) institutions to assess the efficacy and safety of the antiviral drug remdesivir to treat COVID-19. SPRN, a sub-component of NETEC, was instrumental in launching the remdesivir trial; 29% (1,063) of the trial's initial volunteers came from SPRN.
- ✓ **Trained 41,449 participants** from every region of the U.S. through 84 in-person and virtual events.
- ✓ **Completed 192 consultations** for COVID-19 response through provision of subject matter expertise directly to healthcare facilities.
- ✓ **Delivered more than 70,000 hours of on-demand instruction** to healthcare, public health, and first responder personnel.
- ✓ **Confirmed 624,934 views of COVID-19 training videos** with the Personal Protective Equipment module receiving the most views (496,758).
- ✓ **Conducted 29 national COVID-19 response hospital assessments** to determine how existing special pathogens programs impacted acute COVID-19 response.

IN-PERSON NETEC TRAINING PARTICIPANTS BY HEALTH AND HUMAN SERVICES REGION



NETEC thrives on and promotes a culture of readiness; our consortium members boast the highest levels of expertise and frontline experience in handling special pathogens from a variety of different healthcare and health system perspectives. We provide hospitals across the country with nationally recognized education, training, technical assistance, and research infrastructure to advance preparedness and response. NETEC experts lead training and education modules both in-person and virtually, provide invaluable technical assistance and industry-specific consultations, and offer

support services for state public health departments, regional special pathogen treatment centers, state- and jurisdiction-based treatment centers, and frontline facilities.

RDHRE: The Future of Health System Preparedness

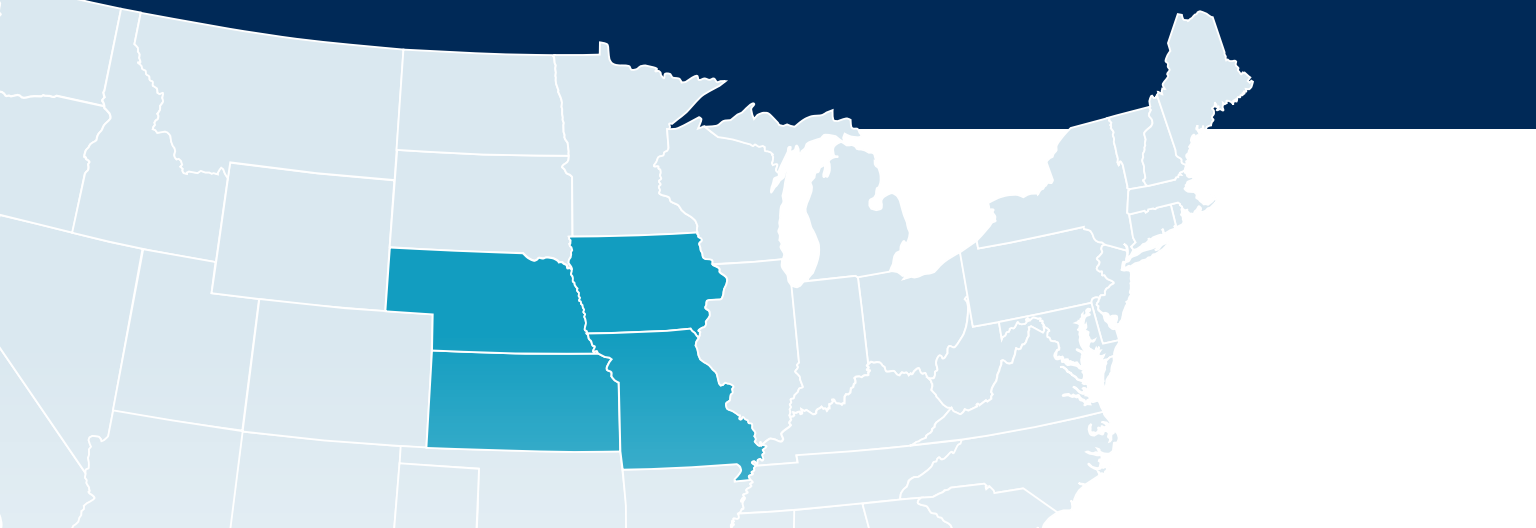
At the GCHS, we consistently find ourselves leading the charge against emerging infectious diseases and other public health emergencies. Our team's collective strengths and experience in treating patients with highly hazardous communicable diseases in the Nebraska Biocontainment Unit, combined with our comprehensive, advanced training and education programs for healthcare and public health professionals such as NETEC and the Region VII Disaster Health Response Ecosystem (RDHRE), has positioned us well to rise to any challenge.

The RDHRE is an initiative funded by HHS/ASPR to innovate how regions best meet the healthcare needs of the public in large-scale emergencies. Through this project, UNMC/NM enables local health systems to provide life-saving care during large-scale emergencies by establishing and tapping into a network of clinical experts and cultivating a system of disaster preparedness that permeates every aspect of the community. One of two initial sites selected for this pilot program in 2018, UNMC/NM was awarded a grant to develop and test regional models for healthcare preparedness that identify and

address community-specific barriers to successful disaster management.

This year, our team quickly adapted its activities to respond to the COVID-19 crisis, focusing primarily on the need for enhanced surge capacity and improved integration of knowledge from overlapping specialty areas within public health, emergency management, and healthcare delivery systems





Specifically, RDHRE implemented the following pandemic response initiatives:

Medical Emergency Operations Center

GCHS conducted comprehensive daily calls between state and local public health, healthcare, political, and response leaders to discuss strategic updates. We reviewed and offered recommendations related to epidemiology reports, healthcare resource utilization, load balancing, lab testing, communication, training, supplies and logistics, and current challenges.

during the COVID-19 response. In addition, the RDHRE connected state hospital associations in Region VII and beyond with federal partners to discuss existing challenges, changing needs, and lessons learned.

Region VII Interactive Map:

RDHRE collaborators developed a regional map and dashboard that displays COVID-19 case counts and overlays healthcare facilities, vulnerable populations, and other information critical for managing response.

Pilot Community Project

RDHRE expanded its community readiness activities into two smaller communities in Nebraska, conducting disaster readiness assessments through custom analyses of COVID-19 impacts based on the demographics of each community to allow for improved planning. RDHRE continues to conduct workshops and share clinical expertise and is partnering to capture response activities as best practices for a community preparedness playbook.

Knowledge Center’s Essential Elements of Information (EEI)

Knowledge Center, a web-based interoperable incident management system implemented in Year 1, was used extensively to track hospital bed availability and resource demands for regional, coalition and healthcare stakeholders

Crisis Standards of Care

RDHRE requested assistance from the GCHS Ethics Advisory Board to define estate crisis standards to include EMS, pediatrics, and monoclonal antibodies. The team also provided extensive education and training on crisis standards of care to coalition stakeholders and state leaders.

RESOURCES & WEBINARS



RDHRE has conducted **10 regional webinars** to share best practices addressing health system challenges



More than **1,000 people** attended RDHRE webinars



More than **2,500 hits** on COVID-19 website resources received since February 2020



Shelly Schwedhelm with health care and public health colleagues at a training week in Lagos Nigeria. Twelve states of Nigeria were represented at the training that covered a wide range of subjects, from PPE donning and doffing to safe injection practices.

A Global Center: International Engagement

Ghana: Strengthening Biosurveillance Capability

In July 2019, Jocelyn Herstein, PhD joined GCHS Executive Directors, John Lowe, PhD, and James Lawler, MD in Ghana to help strengthen existing efforts for infectious disease surveillance and response. Working with key leaders from the U.S. Embassy, U.S. Department of Agriculture, Centers for Disease Control and Prevention's Global Health Security, the Ghanaian Directorate of Agriculture, and the University of Ghana's School of Veterinary Medicine, our team explored new opportunities for OneHealth Research, investigating antimicrobial resistance with Ghanaian collaborators, and established collaborative partnerships the 37th Military Hospital in Accra and the Komfo Anokye Teaching Hospital in Kumasi.

Finally, the GCHS team toured the completely extramurally funded Kumasi Centre for Collaborative Research in Tropical Medicine that conducts a wide range of molecular, diagnostic, and surveillance research. Drs. Lawler, Lowe, and Herstein identified multiple opportunities for UNMC/NM to partner with the Kumasi Center and other Ghanaian organizations to expand current research collaborations, training, and academic exchange programs.

Nigeria: Enhancing Biopreparedness Effort

A team of UNMC/Nebraska Medicine physicians, nurses, and researchers conducted the second round of preparedness and response training for the Nigeria Biopreparedness Initiative in July 2019. The initiative, funded by the Defense Threat Reduction Agency, builds expertise and proficiency for responding to large-scale infectious disease outbreaks. The GCHS, in partnership with the Walter Reed Program Nigeria, Henry Jackson Foundation, Nigeria Ministry of Defense, and U.S. Consulate Nigeria, continues to lead the way in readiness training all over the world. The GCHS team, comprised of Nebraska Medicine infection preventionists, emergency medicine nurses, and Stephen Obaro, Shelly Schwedhelm, and Drs. Herstein, Lawler, and Lowe, provided infection prevention and control training to 22 Lagos trainers, who then partnered with the GCHS trainers to educate roughly 150 healthcare workers from 28 hospitals in 12 states across Nigeria, as well as public health leaders from the Nigerian CDC and 12 Nigerian state CDCs. The GCHS visit to Nigeria was highlighted in a July 17 article in the *Lincoln Journal Star*.



Dr. John Lower presents certificates to attendees at the Nigerian Biopreparedness Effort.



Dr. James Lawler providing training at the Nigerian Biopreparedness Effort.

Berlin: 2019 World Health Summit and Robert Koch Institute

Dr. Lawler, GCHS executive director, and Dr. Herstein, director for Sub-Saharan Africa Region, traveled to Berlin, Germany, to attend the 2019 World Health Summit and learn from notable speakers such as World Health Organization Director-General, Tedros Adhanom Ghebreyesus, PhD, and ministers of health representing Uganda, Ghana, Brazil, Paraguay, and Germany. Dr. Herstein noted the importance of the event from a global health perspective: "Every year, the World Health Summit brings together scientists, healthcare workers, researchers, educators, and politicians to present and discuss global health challenges and strategies for the future. The diversity in stakeholders and disciplines represented are vital to advancing innovative solutions to global health challenges and fostering interdisciplinary collaboration on a global level." After the summit, our GCHS team spent two days at the Robert Koch Institute (RKI), which serves an analogous role to CDC for Germany. Highly esteemed in international circles, RKI shares complementary goals with the GCHS in international preparedness and response for emerging infections. The two teams developed plans for collaboration around a series of topics related to disease surveillance, biocontainment and IPC, medical response teams, and national health security systems. These collaborations take on even greater significance with the lessons of the pandemic and should help keep the GCHS at the global forefront once international work resumes.

Uganda: Gathering Clinical Data with Joint Mobile Emerging Disease Intervention Clinical Capability

After the 2013 – 2016 Ebola virus spread across West Africa, many groups stressed the importance of conducting clinical trials during the outbreak; data from such trials can be analyzed to study the disease itself and inform therapeutic research. In response, the U.S. Department of Defense established a multi-institute project in 2016: the Joint Mobile Emerging Disease Intervention Clinical Capability (JMEDICC). Since its inception, GCHS has worked with the JMEDICC project in Fort Portal, Uganda, pre-positioning a well-trained clinical research team to perform clinical trials during outbreaks of filovirus or other high-consequence pathogens. The end goal of gaining clinical data is to obtain licensure of an effective therapeutic that could have a significant life-saving impact.



Drs. Kratochvil and Lawler participate in a simulated mass casualty exercise at IPRED VI.



A field hospital assembled at the IPRED VI conference to receive patients from a simulated exercise.

Israel: International Preparedness & Response to Emergencies & Disasters Conference

In January 2020, Chris Kratochvil, MD and Dr. Lawler attended the sixth International Preparedness and Response to Emergencies & Disasters Conference (IPRED) hosted by the Israeli Ministry of Health and the Home Front Command in Tel Aviv, Israel. Dr. Kratochvil presented on the GCHS's overall mission, its innovative approaches to strengthening health system readiness ranging from rural community-level outreach to large-scale global training projects, and the Center's breadth of expertise. Drs. Kratochvil and Lawler valued their engaging discussions with conference leaders and attendees regarding health system disaster preparedness and response and welcomed the opportunity to view new cutting-edge technologies. Drs. Kratochvil and Lawler were also privy to demonstrations of fire/emergency response, disaster health exercises, and a large-scale simulated earthquake drill. Along with colleagues from the office of the HHS/ASPR and the Israeli government, they toured a 1,000+ bed disaster surge hospital in Haifa. After returning from the conference, Dr. Lawler noted, "We learned a great deal about the Israeli approach to disaster preparedness that will influence our programs in several distinct ways. Adapting the Israeli emphasis on integration and unity of mission will measurably elevate several of our projects."

GCHS Internal Advisory Board

The Global Center for Health Security's Internal Advisory Board is comprised of experts from across the University of Nebraska Medical Center and Nebraska Medicine. This board regularly convenes to provide vision and guidance to help further the mission and goals of the GCHS.



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James V. Lawler, MD, MPH, FIDSA

Executive Director, International Programs and Innovation, Global Center for Health Security
Deputy Medical Director, Nebraska Biocontainment Unit
Director, Clinical and Biodefense Research, National Strategic Research Institute
Associate Professor, Internal Medicine, College of Medicine, University of Nebraska Medical Center

Dr. James Lawler is an infectious disease physician trained in tropical medicine and public health whose career has focused on emerging infectious diseases, pandemic threats, and health system and public health preparedness. He has responded to multiple infectious disease emergencies, including Ebola in West Africa, Marburg in Uganda, and COVID-19. He is a noted authority on field and health system infection prevention and control for high-consequence infections and has consulted on the topic for multiple non-governmental organizations, national ministries of health, the World Health Organization, and the U.S. government. Dr. Lawler previously served on the White House staff in both the Homeland Security Council Biodefense Office and the National Security Council (NSC) Resilience Directorate, where he led development and coordination of national policy related to medical and public health preparedness, pandemic, and public health emergency response. While at NSC, he co-led White House activities coordinating national policy in response to the 2009 H1N1 influenza pandemic.

In response to the COVID-19 pandemic, Dr. Lawler made a number of early contributions in research, training and clinical operations. He assisted in leading a small team deployed to Yokohama, Japan, to repatriate American citizens quarantined on the Diamond Princess cruise ship, coordinated quarantine and isolation care for exposed/infected Americans returned from Wuhan and Yokohama, participated in site-initiation of the first hospital to conduct a randomized-controlled trial of remdesivir for COVID-19, and characterized environmental contamination related to care of COVID-19 patients. Dr. Lawler has advised local, state and national leadership on COVID-19 response, as well as a variety of entities in the public and private sectors including advising the BIG EAST Conference on safe resumption of activities.



Ken Bayles, PhD

Executive Director, Basic Science Research, Global Center for Health Security
Associate Vice Chancellor for Basic Science Research, UNMC
Vice Chair and Professor, Pathology and Microbiology, College of Medicine, University of Nebraska Medical Center

Dr. Ken Bayles is the founding director of the Center for Staphylococcal Research (CSR), the first of its kind in the country to focus on this infectious pathogen and its impact on human health. Dr. Bayles is co-primary investigator of a U.S. Department of Defense-affiliated National Strategic Research

Institute project to create a “virtual pharmaceutical company” drug-development pipeline at the University of Nebraska. He was named UNMC’s 2017 Scientist Laureate, the university’s highest honor for research. For his contributions to the field of microbiology, Dr. Bayles was recently inducted into the American Academy of Microbiology.



Chris Kratochvil, MD

Executive Director, Clinical Research,
Global Center for Health Security
Associate Vice Chancellor for Clinical Research,
University of Nebraska Medical Center
Vice President for Research, Nebraska Medicine

Dr. Chris Kratochvil served as co-principal investigator of the federally funded National Emerging Special Pathogens Training and Education Center, which supports research and preparedness nationally for the management of special pathogens, and is a co-principal investigator of the National Center for Health Security and Biopreparedness, which trains federal partners and provide quarantine services for the U.S. He is also a member of the Nebraska Biocontainment Unit leadership team. His own research interests include clinical research and drug development with a focus on highly pathogenic infectious diseases. Dr. Kratochvil has been instrumental in many aspects of the COVID-19 pandemic response initiated by Nebraska Medicine, including the activation of the National Quarantine Unit and supporting the first approved COVID-19 medical countermeasure research efforts. In March 2020, Dr. Kratochvil was appointed chair of the Big Ten Task Force for Emerging Infectious Diseases.



John-Martin Lowe, PhD

Executive Director, Training and Education,
Global Center for Health Security
Assistant Vice Chancellor for Interprofessional
Health Security Training and Education, UNMC
Associate Professor, Environmental, Agricultural
and Occupational Health, College of Public
Health, University of Nebraska Medical Center

Dr. John-Martin Lowe is a virologist and environmental exposure scientist whose expertise focuses on risk — specifically, the identification, characterization, and management of risk for patient-, community-, and industry-centered environments, particularly related to emerging infectious diseases. He is co-principal investigator for the National Emerging Special Pathogens Training and Education Center, where he established an international network for emerging infectious diseases; lead investigator for a multi-

country biosurveillance network in Africa; and leads a U.S. infectious disease training center for federal responders.

Dr. Lowe led successful efforts at the National Quarantine Unit and Nebraska Biocontainment Unit to provide monitoring and care for repatriated U.S. citizens exposed to and infected with SARS-CoV-2. He also led early and continued efforts to characterize the transmission dynamics of SARS-CoV-2, which were presented in a joint meeting hosted by the Academy of Medicine and American Public Health Association in April 2020. Dr. Lowe has co-authored numerous book chapters and scientific papers on control and response to emerging pathogens. Since the 2015 West Africa Ebola outbreak and throughout the current SARS CoV-2/COVID-19 pandemic, he has served in many expert consultative roles on disease risk assessment and management. Dr. Lowe has provided technical consultation and participated in infection prevention and control, as well as industrial hygiene, in more than 23 countries to a variety of industry sectors including healthcare, food production, hospitality, finance, and insurance. Most recently, he provided consulting services to meatpacking facilities on risk assessment and management and an international cruise ship company, advising on all aspects of biorisk management including outbreak prevention and response.



Shelly Schwedhelm, MSN, RN, NEA-BC

Executive Director, Emergency Management
and Clinical Operations, Global Center for
Health Security
Executive Director of Emergency Management
and Biopreparedness, Nebraska Medicine

Shelly Schwedhelm has served in leadership roles within Nebraska Medicine for more than 35 years. During the Ebola virus disease outbreak of 2014 – 2015, Schwedhelm had overall accountability for the Nebraska Biocontainment Unit operations and logistics. She traveled on readiness site visits with the Centers for Disease Control and Prevention and developed a two-day Ebola education training program held on the UNMC campus. She currently oversees numerous grants associated with infectious disease and is a program director and subject matter expert with the National Emerging Special Pathogens Training and Education Center (NETEC).

Ms. Schwedhelm has been instrumental in the COVID-19 pandemic response and emergency planning by activating and managing the emergency operations center, coordinating and initiating response plans with state and federal partners, and most recently, touring the state’s meatpacking and other facilities to provide guidance on administrative and engineering controls to mitigate the spread of COVID-19.

Contributors

As we reflect on the many challenges 2020 presented, we wish to recognize the dedicated individuals who tirelessly worked in collaboration with the Global Center for Health Security to overcome obstacles and implement innovative solutions in response to the SARS-CoV-2 global pandemic. We would like to thank each person for their courage and determination in the face of adversity—we are deeply grateful for their generous support that benefits our community, state, nation, and ultimately, our world.

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Resources

Playbooks

The Global Center for Center for Health Security, partnering with the College of Public Health and Central States Center for Agricultural Safety and Health, has compiled playbooks of best practices as guidance for public and private organizations on how to best mitigate the risk of transmission of COVID-19. These materials are available free for download at the GCHS website.

 [Cattle Feeding Facility](#)

 [Child Development Centers](#)


 [Higher Education](#)

[School Guide and Supplemental Material](#)

 [Poultry Growers Facility](#)

 [Court Systems](#)

 [PK-12 Education](#)

 [K-12 Back to School – Spanish](#)

 [Meat Processing](#)

 [K-12 Back to](#)

Crisis Standards of Care

The provision of medical care during a pandemic requires considerable planning, along with the recognition that the delivery of healthcare services may change quickly due to the potential scarcity of resources. Crisis Standards of Care are guidelines for how the medical community should allocate scarce resources when patient needs exceed the resources available. Nebraska healthcare providers hope to avoid using CSC, but they must be prepared to use the standards if ever necessary. The public's dedication to practicing recommended non-pharmaceutical interventions (mask wearing, physical distancing, etc.) is the most effective way to help hospitals and communities avoid having to use CSC due to the COVID-19 pandemic. The Nebraska Medical Emergency Operations Center, a state-wide, joint initiative with participation from health care coalition's coordinators, CMOs, COOs, and health care associations, developed these CSC in response to the COVID-19 pandemic.

 [Nebraska Crisis Standards of Care](#)

 [Nebraska EMS Crisis Standards of Care](#)

Ethics Consultations

The GCHS Ethics Advisory Committee acts as a resource for any person or organization that needs guidance in a COVID-19 ethical issue. A request can be made on the GCHS website [Ethics Advisory Committee Request Form](#). After careful review and consideration, the Ethics Committee creates and makes a report available on the GCHS website for public review.

 [Comfort-Only Care Unit](#)

Cohorting COVID-19 and non-COVID-19 patients in a Comfort-Only Care Unit.

 [Meat Processing Facility Operations](#)

Ethical Considerations Regarding Meat Processing Plants Operations, Worker Safety, and Community Welfare



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