

The Military Treatment Facility COVID-19 Response in an Isolated Rural Environment: Challenges and Lessons Learned

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ABSTRACT The coronavirus disease-2019 (COVID-19) pandemic remains an extraordinary event that continues to strain healthcare systems worldwide. Unlike the military treatment facilities (MTFs) in the USA, which have ready access to tertiary care facilities, those MTFs in foreign countries confront a host of challenges in meeting mission requirements. In this article, we discuss the MTFs' COVID-19 response in the rural environment of Bavaria, Germany. Relevant factors including regional and clinic response, force health protection, and contingency planning, which influenced the MTFs response, are identified. These factors are further analyzed from a "lessons learned" perspective, and recommendations to shape the future response to a pandemic are provided. This current crisis portends a future where pandemics may remain an omnipresent threat.

INTRODUCTION

Pandemic is defined as "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people."¹ This effect was quite evident as the coronavirus disease, coronavirus disease-2019 (COVID-19), swept through Europe and the USA,² placing an incredible strain on the healthcare system as it responded to this novel infectious disease. Within the USA, large metropolitan areas such as New York City and Seattle were the hardest hit.³ Despite their robust healthcare systems, the surge in infections severely strained healthcare resources and capabilities. If large and complex healthcare systems were overwhelmed by the pandemic, what would happen to those regions with limited healthcare resources? How could they best prepare? To that end, this commentary will briefly examine the challenges and lessons learned from a small U.S. army medical treatment facility (MTF)'s response to the COVID-19 pandemic. We discuss the regional and clinic level response, force health protection, contingency planning, and review lessons learned.

BACKGROUND

The Medical Department Activity Bavaria (MEDDAC-B) is located on Rose Barracks, a U.S. military post in the rural village of Vilseck in the German state of Bavaria. The MEDDAC-B headquarters commands five MTFs positioned from east to south and across two German states of Bavaria and Baden-Württemberg (see Fig. 1).⁴ These MTFs provide

essential outpatient services to the beneficiary population of active duty service members (SMs) and their family members. However, for medical emergencies and specialty care requiring inpatient services, the host nation (HN) hospitals are utilized, as these services are not available in MEDDAC-B MTFs. In total, these five MTFs provide health care for a beneficiary population of over 34,000 personnel.

Germany's cases quickly rose, with Bavaria and Baden-Württemberg being two of the hardest-hit states with over 5,000 cases reported (or 44–48/100,000/population) as of March 24, 2020.⁵ There was great concern that the HN nation facilities could not support their beneficiaries plus the local U.S. military population. Once HN facilities reached 90% patient occupancy, U.S. Army Health Clinic-Vilseck (USAHC-Vilseck) would need to treat and hold patients for up to 72 h before transport to the Landstuhl Regional Medical Center (LRMC). This potential requirement created logistical challenges as the five MEDDAC-B MTFs located at Grafenwoehr, Vilseck, and Hohenfels are between 358 km and 378 km away from LRMC, while the MTFs at Ansbach and Stuttgart are 246 km and 197 km away.

REGIONAL RESPONSE TO COVID-19

Communication

An effective response to the pandemic required military and civilian medical personnel's coordinated efforts. The HN's and USAHC-Vilseck's primary goal was to slow the disease spread by "flattening the curve," i.e., implementing public health measures to reduce the infection rate over a longer period so as to not overwhelm the healthcare system capacity.^{6,7} To that end, the seventh Army Training Command (ATC) commander established a public health response that implemented robust quarantine rules. The seventh ATC commander established this guidance based on the U.S. Centers for Disease Control (CDC) guidance⁸ and the German Government's Bavarian Ordinances.⁹ These measures included travel restrictions for essential activity only, i.e., work, food, and medical care.

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FIGURE 1. U.S. Army medical assets Germany.

Additionally, to establish and enforce the extensive public health measures, the seventh ATC commander asserted command-and-control of all posts and communicated specific guidance to be followed. This guidance included 14-day quarantine rules, screening procedures, testing criteria, and access criteria for entrance onto the post. All personnel attempting access to the base were screened with the following questions: “Have you left the country in the last two weeks,” “Do you have any symptoms,” and “Are you on quarantine.” Other efforts included community messaging via Facebook Live town hall meetings, which were conducted weekly with key leaders providing the most up-to-date information to soldiers and their families.

The second Cavalry Regiment (2CR) is the primary unit in Rose Barracks and its soldiers receive most of their care at USAHC-Vilseck. The 2CR commander established screening measures, quarantine rules, lockdown guidelines, and testing procedures based on the seventh ATC commander’s guidance. The main difference was the lockdown measures in Rose Barracks. Those living in the base were prohibited from leaving it unless there was an emergency, and those living off-post were required to have a yellow exit pass. These efforts enabled standardization and enforcement of public health measures through USAHC-Vilseck using garrison-level assets. Second Cavalry Regiment and USAHC-Vilseck had weekly meetings to discuss the implementations and how they could be improved. The MEDDAC-B prepared the healthcare staff for

a worst-case scenario and established surveillance testing to randomly test SMs to identify potential asymptomatic but COVID-19-positive cases to decrease disease spread. This coordinated effort provided continuity between command groups and built trust with medical staff tasked to manage this pandemic.

When increased numbers of positive cases threatened the HN’s inpatient and emergency services, capability limits were placed on the type of care they could provide to SMs and their families. Emergency rooms had limited treatment to emergent care only for patients presenting with a stroke or heart attack. Many outpatient specialty services, including elective surgeries, were canceled to conserve resources and capabilities such as personnel, personal protective equipment (PPE), and hospital beds. Due to the closure of HN specialty services and non-emergent care, SMs and beneficiaries could only receive care at USAHC-Vilseck. Commanders quickly realized that with increased patient volume at these clinics, the risk of staff exposure to COVID-19 increased. The potential increase in COVID-19-positive patients coming through the clinic created a readiness threat to the USAHC-Vilseck and medics assigned to 2CR who work in the clinic.

The 2CR commander’s solution was to create a dedicated area for patients presenting with COVID-19 symptoms to be screened and tested in a separate location from the clinic. This effort resulted in establishing the acute respiratory center (ARC) located on the Vilseck airfield, roughly 1.5 miles

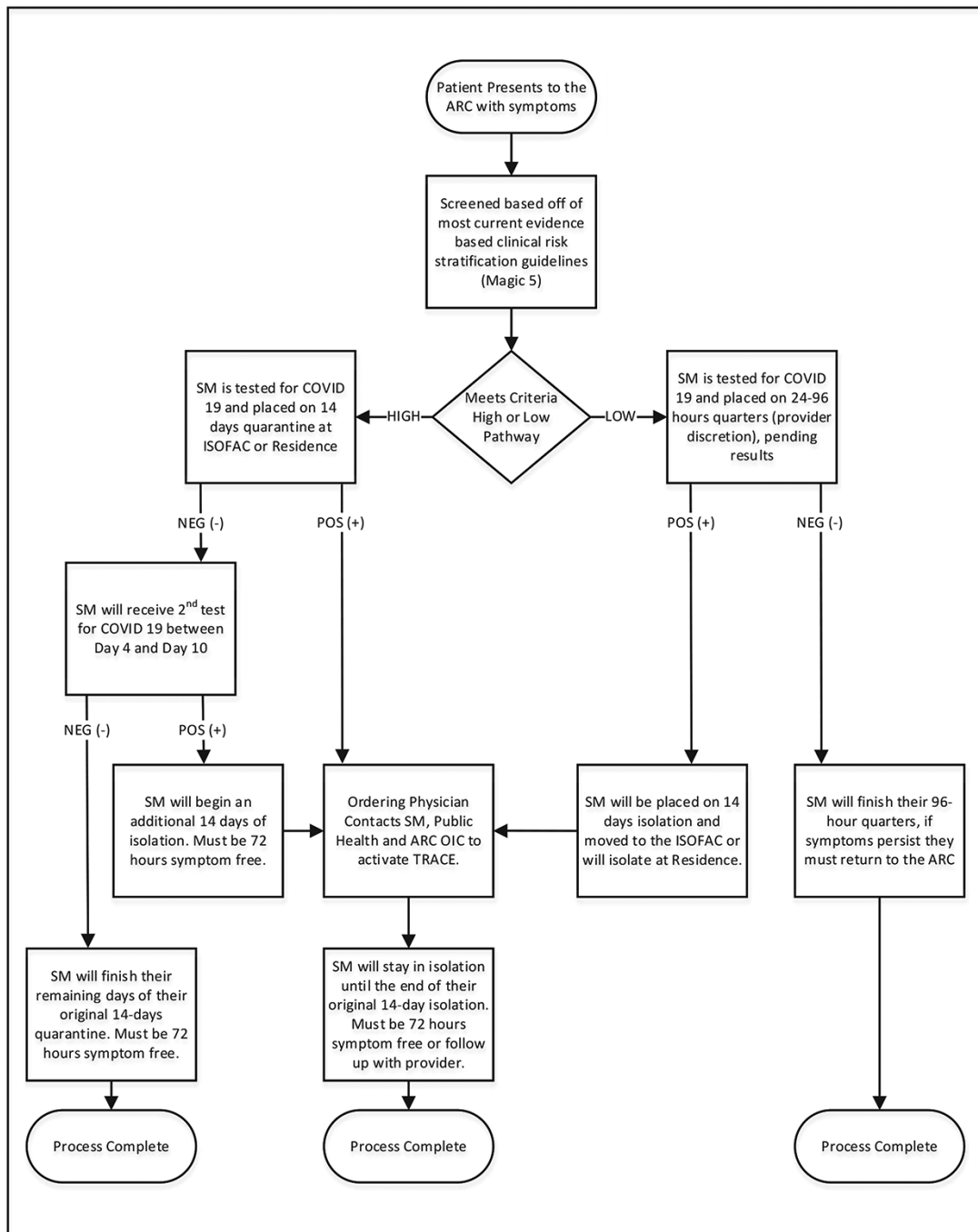


FIGURE 2. Acute respiratory clinic screening algorithm.

away. The ARC was staffed 24h, 7 days per week (24/7) by a provider, nurse, non-commissioned officer, and 7–10 medics. The ARC provided rapid screening for all personnel entering the base or presenting to the clinic with COVID-19-like symptoms. Locating the ARC on the Vilseck airfield prevented high-volume traffic through the clinic that could expose patients and staff to the COVID-19 virus and isolated the cases of COVID-19 from spreading within the post.

Also, it allowed the clinic to focus on caring for patients with non-COVID-19-related chronic and acute healthcare needs.

CLINIC RESPONSE TO COVID-19

The ARC providers followed a triage and treatment algorithm (see Fig. 2). Patients were screened for pertinent travel history to high-risk locations and COVID-19 symptoms and had

their temperature taken. Patients who were febrile (temperature >99.5°F) were presumed to be COVID-19 positive and were moved to an isolation tent outside the hanger to reduce the potential spread to other patients and staff. The provider's clinical judgment and laboratory results determined whether a patient should self-isolate, be quarantined, or return to work. According to the CDC, self-isolation is separating sick people with a contagious disease from healthy people. In contrast, quarantine separates and restricts the movement of people exposed to a contagious disease to see if they become sick.¹⁰ Therefore, patients with a COVID-19 diagnosis were ordered to self-isolate in their home and avoid contact with all family members for 14 days or until symptoms subsided for 72 h without medication intervention.

FORCE HEALTH PROTECTION

Personal Protective Equipment

At the beginning of the pandemic, stores of PPE and other critical supplies were limited, as shipments had not arrived from the U.S. Army Medical Material Center, Europe. Due to the highly infectious nature of COVID-19, there was a critical need for PPE and requisite training in its use to reduce the risk of transmission between infected patients and medical staff. The USAHC-Vilseck initially had no N95 masks in stock when the pandemic began. Items like gowns and face shields were in stock, but the amount available would have lasted 2 days if not reused. A subject matter expert (SME) from the USAHC-Vilseck provided PPE education on proper donning and doffing of gowns, gloves, N95 masks, and face shields. The SME was also responsible for fit testing personnel for N95 masks. However, there was only one N95 fit testing kit and two SMEs between Rose and Tower Barracks, which delayed the process of fitting over 200 military and civilian personnel in Rose Barracks. The fit test kit would be handed off 2–3 times a week between the USAHC-Vilseck SME and the USAHC-Grafenwoehr SME once all schedules with 2CR medic personnel and clinic staff were finalized.

Testing Challenges

The need for increased testing created additional challenges. The highly infectious nature of COVID-19 and the fact that its symptoms could mimic other infections such as influenza prompted an increase in testing prevalence. At the beginning of the pandemic, providers thought it was better to test for COVID-19 than not. However, as testing requirements increased, so did the workforce needed to collect, package, and ship the tests more frequently to LRMC for processing. The USAHC-Vilseck laboratory department provided the swabs and prepared the shipments of specimens for transport to LRMC. Collection of COVID-19 and influenza samples occurred 24/7 at the ARC. Medics were properly trained on the swabbing technique through the nares before they arrived at the ARC. These medics later provided education

and training to 2CR medics on properly collecting and packaging the specimens for transport to the laboratory without contamination.

Contact Tracing

Identifying, assessing, and managing SMs with a potential COVID-19 exposure was critical to prevent the disease's further spread. As the public health nurses assigned to USAHC-Vilseck and contact trace teams in 2CR completed contact traces, over 50 close contacts needed testing. An example of a significant trace was during a large training event soldiers were conducting. A mass trace was a result of one positive patient that would lead to over 75 close contacts. There was a noticeable need for additional assistance at the ARC to process all the patients. Nurses were responsible for crowd control, swabbing patients, and providing discharge education while the providers assessed and diagnosed the contacts. Effective contact tracing required leadership communication at all levels to ensure proper coverage at the ARC and USAHC-Vilseck. Therefore, biweekly meetings were established between the 2CR and USAHC-Vilseck to ensure accurate and timely information dissemination.

CONTINGENCY PLANNING

Just in Time Training

Experience and competency levels of the USAHC-Vilseck's nurses and medics were not adequate for critically ill patients requiring modalities beyond those encountered in routine outpatient care. In the outpatient setting, nurses are responsible for screening patients for the concern, bringing them in, performing and identifying abnormal vital signs, administering immunizations, replying to telephone consults, providing wound care, and responding to cardiac or respiratory distress in a Basic Life Support capability only. However, COVID-19 abruptly changed this situation and forced new critical nursing requirements for the staff.

To address this gap, the clinic and education department at MEDDAC-B, while working with Regional Health Command-Europe and LRMC, provided "just in time training." These classes focused on nursing care and management of patients with acute respiratory symptoms. Staffs were required to take online classes via Elsevier and then attend in-person skills validation. Stations were set up with mannequins, ventilators, and essential supplies needed to manage acute respiratory symptoms. The instructors provided education on the proper use of portable ventilators and the management of endotracheal and nasogastric tubes. Nurses then performed hands-on simulations for further familiarization. A final test-out scenario enabled nurses to apply their knowledge on primary assessments and interventions requiring oxygen or an advanced airway. The staff consensus was to incorporate these skills into the initial staff orientation and conduct yearly skills validation as required by Competency Assessment Folders. These changes would help maintain

those critical skills should a second wave occur or if a new pandemic arises in the future.

LESSONS LEARNED

This pandemic was a first for every nurse, medic, and health-care provider. There was little or no experience or institutional knowledge to draw from, which resulted in a great deal of uncertainty in managing the crisis. The following section will discuss important lessons learned from the regional and clinic level response, force health protection, contingency planning, and returning to normal operations. These matters are likely similar to what other military MTFs faced. They are also unique due to the geography and locations of these Bavarian MTFs. Importantly, this knowledge may benefit those small civilian healthcare facilities located throughout rural America.

Regional and Clinic Level Response

Leveraging garrison- and brigade-level command teams to manage the pandemic response was essential for mission success. This was similar to the way governments collaborated with healthcare systems to respond to the pandemic worldwide. The public health initiatives implemented to control the pandemic's spread were crucial. They would have been impossible to initiate and enforce from a clinic or even the larger medical component because the measures required abrupt changes in people's lifestyles and behaviors.

Brigade- and garrison-level commanders can enforce adherence to behavior change due to the assets at their disposal, such as law enforcement and gate control; the ability to shut down and open commercial sectors on bases; and stop movements, leaves, and passes. Keeping the clinic staff involved in communication was vital to overcoming the frequent changes in standard operating procedures. Team huddles were established to improve group communication, address daily concerns covering COVID-19 testing criteria, logistical or personnel issues, and provide local and regional updates.

Force Health Protection

The Defense Health Agency's primary mission is to maintain military readiness, i.e., preserve the fighting strength. To achieve those ends, keeping the staff healthy and able to perform their mission was vital. As the transmission of COVID-19 results from close contact and respiratory droplets,¹¹ having sufficient PPE stores was critical. Therefore, all clinics should consider increasing their storage of PPE for future contingencies.

Pandemic control through testing and contact tracing was another essential force protection measure. This effort was necessary because of the coronavirus's virulence and the fact that infected patients could be asymptomatic. Having a MEDDAC-B or USAHC-Vilseck staff member unknowingly infecting nursing and medical staff posed a significant risk and could compromise their ability to perform their mission.

Another vulnerable population was the soldiers because of barracks living and the fact that the units in Bavaria conduct many field-training exercises, requiring soldiers to quarter in field tents that increase exposure risk. As in the past, disease non-battle injury represents the most significant risk of morbidity to military personnel.¹² The testing of personnel was a vital mission, including surveillance testing to identify asymptomatic carriers. However, it required additional manpower to staff the testing sites, process the specimens, and perform contact tracing, which could be time and labor-intensive. Therefore, cross-training of medics or other staff members is a crucial contingency consideration for a future pandemic.

Contingency Planning

The majority of Army Nurse Corps Officers start their military career as inpatient medical-surgical nurses. Training is conducted for mass casualties but not pandemics. The current COVID-19 pandemic provides important lessons learned that could be incorporated in Army Nurse Corps Officers training to improve readiness. It has forced nurses to respond to a whole new set of challenges that a pandemic brings.

This pandemic also illustrated that nurses in various roles utilize different skill sets. However, no matter where they work, military nurses must be able and ready to respond to all types of emergencies. The skills learned from mass casualties and triaging patients are essential for staff to maintain their competencies. However, a new requirement has emerged, and that is how to respond to a pandemic. Since militaries can weaponize biological diseases and viruses, our capability to respond to these threats must remain high.

Current training and validation of skills will need to be flexible to the ever-changing threat environment. Validating Individual Critical Task List or Mission Essential Task List competencies will remain at the forefront of training. However, new scenarios must implement training that enables the effective response of all staff to a pandemic. Finding time for staff training remains a challenge for all disciplines actively engaged in healthcare operations. However, skills not practiced are skills that will be lost. Therefore, command support and innovation that enhance skills development in the current time-constrained environment remains critical.

CONCLUSION

This pandemic highlighted gaps in the military healthcare system on how to best respond to a pandemic. However, important lessons learned have improved our capabilities. A critical component identified was the need to swiftly establish a single point of communication to ensure rapid, decisive, and precise messaging. As healthcare workers are at the "tip of the spear," ensuring their health and safety to execute the mission is paramount. Screening remains a central component to stop the spread of a pandemic. Understanding the need for a borrowed workforce and cross-training enabled faster processing and quicker test results. The variability in

staff training and experience between inpatient and outpatient underscores the importance of readiness and skills training, no matter where we practice. In a future pandemic, access to a medical center's capabilities may not be readily available. Staff in outpatient environments may need to hold and treat very sick patients for extended periods. Therefore, their training must align with these requirements to ensure the best patient outcomes. As of this writing, the USA and Europe are amidst another surge in infection rates, with multiple countries enacting severe restrictions and lockdowns. Fortunately, the military has learned important lessons and is better prepared to respond to what is likely to be an omnipresent threat both now and in the future.

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DISCLAIMER

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CONFLICT OF INTEREST STATEMENT

The authors have no known conflicts of interest of financial or material support disclosures.

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