


Covid 19: A community based nursing disaster response

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Abstract

Nursing has been criticized for inconsistent and episodic attention to disaster response training in academic settings. The work described herein demonstrates that nursing was not only prepared for the COVID-19 pandemic but was able to mobilize and lead a large-scale response that benefited a university community and the larger surrounding communities and neighborhoods paying particular attention to marginalized populations. For healthcare providers outside of hospitals, it was clear that disaster response methods would need to be implemented. The authors demonstrate that nursing established an on-the-ground response in collaboration with other University officials and departments. Initially established for the University community, the response was moved into surrounding neighborhoods vaccinating the city's most vulnerable. The nurse led effort answered more than 25,000 Hotline telephone calls, collected more than 30,000 COVID-19 molecular tests, and administered more than 150,000 COVID-19 vaccines in an operation that served up to 2500 people a day for 5 months. Nurses saved thousands of lives at the height of the COVID-19 pandemic in hospitals and in community-based settings. The University of Texas Health Science Center San Antonio School of Nursing demonstrated the nimble nature of academic nursing and outlines a large-scale community response to an international pandemic in the seventh-largest United States city. The authors establish guidelines for nurses and others to follow for future events.

KEYWORDS

access to health care, collaboration, community health nursing, disaster response, disease management, disease prevention, emergency preparedness, epidemic

1 | INTRODUCTION

Nursing has been criticized for inconsistent attention to disaster response training in academic settings (Venema, et.al, 2016). The work described herein demonstrates that nursing was not only prepared for the COVID-19 pandemic but was able to mobilize and lead a large-scale response that benefited a university and the larger surrounding

communities paying particular attention to marginalized populations. For healthcare providers outside of hospitals, it was clear that disaster response methods would need to be implemented. The authors demonstrate that nursing established an on-the-ground response in collaboration with other University officials and departments. Initially established for the University community, the response was moved into surrounding neighborhoods vaccinating the city's most

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vulnerable. The nurse led effort answered more than 25,000 Hotline telephone calls, collected more than 30,000 COVID-19 molecular tests, and administered more than 150,000 COVID-19 vaccines in an operation that served up to 2500 people a day for 5 months. Nurses saved thousands of lives at the height of the COVID-19 pandemic in hospitals and in community-based settings. The University of Texas Health Science Center in San Antonio Texas (UT Health) School of Nursing (SON) demonstrated the nimble nature of academic nursing and outlines a large-scale community response to an international pandemic. The authors establish guidelines for nurses and others to follow for future events.

On May 12, 2022, President Joe Biden announced that one million American lives have been lost to the COVID-19 virus (Statement from the president, 2022). One million people is the equivalent of the Civil War and the World War II death toll combined (Johnson, 2022). It is difficult to recall the day-to-day challenges faced by healthcare providers in the early days of March 2020. Daily journaling would have provided the smallest details but in retrospect, this overview tells the story and provides direction for the next pandemic. If we are caught unprepared once again, it offers a step-by-step guide that calls upon the basic principles of infection control and public health. This report attempts to recall those early days and the critical role nursing played in the community-based response to the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic.

It has been nearly three years since the early reports of COVID-19 reached public awareness in the United States. SARS-CoV-2, also known as COVID-19, was diagnosed in the United States on January 21, 2020, in Snohomish County, Washington after a 35-year-old male returned from a trip to Wuhan, China. The following day, 282 cases were reported in China. The cases in Wuhan doubled from January 21st to January 23rd with 300 additional people sickened and 13 more dying. By January 30, 2020, the disease grew exponentially with 7,818 cases confirmed in China and other countries (Agrawal et al., 2020). Recognizing the global implication for spread, the World Health Organization (WHO) declared Public Health Emergency of International Concern on January 31, 2020 (WHO General Director's Opening Remarks, 2020). The Secretary of Health and Human Services, Alex Azar, determined that a public health emergency exists in the United States on the same day (Determination that a public health emergency exists, 2020). By February 3, 2020, it was reported that more than 20,000 people were infected globally. President Donald Trump declared a state of public health emergency (Proclamation declaring national emergency concerning the novel corona virus, 2020). The pathogen was clearly more virulent than any disease healthcare had seen in many years. The last pandemic of this magnitude was that of 1918–1919 caused by the H1N1 influenza virus which killed an estimated fifty million people worldwide and more than 650,000 Americans. By March 11, 2020, WHO declared COVID-19 a pandemic. Not only was the spread rapid, becoming global in 1 month, but the illness was severe. On March 2nd Italy, the world's seventh largest economy, had already closed its international borders and placed the entire country on lockdown after closure of its Northern Region alone failed to control the spread. Infection overwhelmed the Italian

healthcare system with more than 9,000 cases, the highest number outside of China at the time (American Journal of Managed Care, 2021).

As we are more than halfway through year 3, the days of no testing, lack of treatment protocols, or vaccines seem unimaginable, but in early March of 2020 healthcare was facing the greatest public health crisis in a century. On March 14, 2020, New York reported 643 new cases per day. Less than 2 weeks later, on March 27th there were 4066 new cases per day (NYC Health, 2020). Nightly news exposed the frightening scenes of ambulances rushing across New York City as thousands of people fell ill, were hospitalized, and died. While a sizable portion of the United States remained unscathed, the governor of New York requested ventilators for hospitals that were filling to capacity. Healthcare providers across the globe worked diligently to mitigate what was certainly a global pandemic of major proportion. Little was known about the zoonotic virus. It was hypothesized at the time that much like H1N1, the virus was Avian in nature. Early reports of SARS-CoV-2 incubation and transmission from research in China found that the average incubation period was 5 days with most symptoms developing within 11 days of exposure (Zou et al., 2020). This information would become critical to containment efforts in community settings.

Over the coming months, few were spared the veracity of the disease. Much like the H1N1 *Spanish Flu* pandemic of 1918, the rise of infection struck in waves. There was a significant difference, however, between 1918 and 2020 from a scientific perspective. The science of virology, which did not exist in 1918, was extensive in 2020 and vaccine campaigns had contained and even eradicated diseases across the globe. Antiviral medication had been used successfully to treat even some of the most devastating viruses including but not limited to HIV/AIDS. Perhaps it was our experience in controlling viral illness that made it so difficult to believe that keeping up with COVID-19 transmission was an arduous task. In March 2020, the virus outpaced the resource response, and it was clear that until research and development could be relied upon, the basics of limiting the spread of disease would become critical. The earliest response turned to the fundamentals of disease prevention that had been successfully practiced for over a century: masking, handwashing, and limiting exposure to persons outside one's domestic circle (unless of course participating in on-the-ground healthcare delivery). People of color, the elderly, and those with underlying health conditions were disproportionately impacted by severe illness and death in the United States. One million people in the US had succumbed to the virus by May 17, 2022, with Hispanics and Blacks suffering the greatest burden of disease and death (Centers for Disease Control, 2021).

The University of Texas Health Science Center San Antonio (UT Health) is a leading academic health center in South Central Texas (TX) with a mission to make lives better through excellence in advanced academics, life-saving research, and comprehensive clinical care including health, dental, and cancer services. Located in Bexar County, TX with over two million square feet of facilities for education, research, treatment, and administration, UT Health is a dynamic and rapidly expanding health science center with five professional schools, a diverse workforce of 7100 including faculty, staff and residents, a

FY 2022 annual operating budget of more than \$1 billion, a clinical practice with revenues of over \$540 million and a research portfolio of \$309 million.

1.1 | Method for disaster response

The University's response to the COVID-19 public health crisis was swift and decisive. Even in the earliest days, it was clear that nursing had the most experience in disaster management and public health emergency. A committee of experts convened on March 2, 2020, by the University President. The team was comprised of infectious disease (ID), ethics, environmental health and safety (EHS), human resources, marketing, and communication. The Vice Dean of Practice and Engagement at the SON who had extensive experience in disaster response was invited to attend the President's inaugural meeting of the COVID-19 response team. The guiding principles of the committee were: (1) focus on operations, (2) communicate plans clearly, (3) support clinical needs, (4) develop operational response, (5) keep CALM and be CLEAR, (6) make every decision with compassion, (7) maintain a flexible approach, (8) never lose sight of patient safety. The University closed to students and faculty on March 13, 2020. Preparations were made to transition to virtual learning. For any didactic teaching-learning experience, virtual delivery might have been a challenge prior to March 2020, but the University's information technology team quickly identified and implemented platforms that made virtual learning possible. Faculty who had never taught virtually found themselves in an unfamiliar teaching environment. Establishing the platforms for this transition to occur within days of initial planning was overwhelming. Complicating the virtual learning concern was the education of future healthcare providers where patient contact is not only the norm but a critical element of the educational experience (Dewart, Corcoran, Thirsk, Petrovic, 2020). Could we send students into an environment where they might be exposed and succumb to an unpredictable and deadly disease which was still poorly understood? Continuity plans were developed for not only education, but all services provided by the University including research and clinical care. The physician workforce would be asked to support any hospital surge that would inevitably take place. Reassignment of clinical staff was continuously considered, and the physician workforce was moved from outpatient duties to inpatient care. Nursing faculty would eventually be involved in the community-based response.

It was clear from the earliest days of the response that the nursing clinical enterprise, *Wellness 360* would be called upon to reinforce COVID-19-related services on campus. Providing healthcare to students, staff, faculty, families and the community, *Wellness 360* is the SON's 6-million-dollar a year academic nursing clinical practice. On the campus of UT Health, *Wellness 360*, an advanced practice nursing (APRN) clinical enterprise, has provided care to students and employees for more than a decade. In 2017, a mobile medical unit (MMU) was purchased by the SON in response to Hurricane Harvey. Faculty, students, and providers made more than 30 round trip visits to coastal

Texas in response to that disaster with the MMU. In 2018, *Wellness 360* added pediatric healthcare services at the UT Health campus site and has since expanded its reach to rural communities in south central Texas through its Foster Care Center of Excellence. In the early days of the COVID-19 crisis the *Wellness 360* clinics were deemed essential services and remained open to virtual and in-person care. Soon the practice would be called upon to deliver COVID-19 related services across the county with the MMU. Over the course of the COVID-19 pandemic *Wellness 360* opened clinical sites on three additional college campuses further expanding the reach of the nurse led clinical enterprise.

A. Information

By March 9, 2020, the ID team and *Wellness 360* were overburdened with telephone calls from across the campus from every level of personnel. Three ID physicians and four nurses (authors here) made-up the immediate response team. It was impossible to conduct healthcare delivery and answer the relentless telephone calls. Although website information was updated frequently, it was evident that all levels of providers including physicians, nurses, researchers, students, and staff had questions about management of possible exposures, length of quarantine when arriving from travel, who would be expected to work in person after an exposure and who would work from home. In 2017, Sickora et al. (2020) found that communication in the early days of disaster is a crucial first response. Therefore, a telephone response system was implemented within days of recognizing that questions could not be answered on a website alone. Every level of faculty, staff and student needed the individualized touch of a phone call—a live person on the other end of a phone. It was determined that the call center must consist of critical-thinking personnel who could take the most up-to-date information and apply it to individual circumstances. A “script” was recommended but nursing quickly explained that scripting responses would not and did not meet the needs of the callers. The call center team worked closely with ID, EHS, and the University task force daily to ensure counsel was provided appropriately and accurately. By March 18th, the University established a Hotline staffed by master's level nurses. The team would eventually respond to over 250 calls a day during local surges of infection with over 25,000 total calls before its disbanding in Spring 2021.

B. Testing

COVID-19 testing is now ubiquitous. In the early days of the pandemic, however, identifying disease was critical and complicated. In March 2020 testing was a national concern and dominated headlines (Sharfstein et al., 2020). To control spread of the virus, it was necessary to identify who hosted the Sars-CoV-2 virus and ensure quarantine of the infected person and close contacts, thereby preventing the “silent spread” of disease (Carter et al., 2020, p591). Viral spread rapidly outpaced testing capacity in the early days of the pandemic. The Centers for Disease Control (CDC) released an approved test under the Food and Drug Administration (FDA) Emergency Use Authorization (EUA)



sending test kits to local public health laboratories across the country. This initial attempt had limited success. Results from the kits were found to be inconclusive or invalid. Local laboratories were encouraged to develop their own tests, but any newly developed test needed EUA from the FDA (Sharfstein et al., 2020). The process of test development and FDA requirements slowed testing capacity. When tests were finally developed and approved in all fifty states on March 12, 2020, supply chain issues became a concern. The test medium had to be secured, as well as tubes for the medium, and nasal swabs. Lack of any component of the kit limited testing. Laboratories and hospitals across the country were scrambling for these finite resources. Unique characteristics of COVID-19 further complicated testing. Peak viral load and shedding prior to symptom onset allowed for asymptomatic transmission and contributed to the virus' adept ability to spread (Zou et al., 2020). This made timing of testing particularly tricky and created confusion and mistrust in community settings. With limited resources and a healthcare workforce that was in critical need of testing, limits were placed on which individuals could or should be tested. The inability to confirm positivity crippled parts of the country where case counts were rising and diagnostic confirmation with high-sensitivity PCR testing was taking up to a week.

C. Business Continuity

The SON's nurse-managed *Wellness 360 Clinic* was the first mass testing facility in the city of San Antonio. In collaboration with the UT Health School of Medicine's (SOM) Department of Pathology, the testing site was the only one within the region to return results in less than 24 hours. All tests were collected outside of the building (eventually under a tent) in the early morning with results by day's end ensuring return to work for doctors, nurses and other healthcare providers while quarantining those with positive results. The SON testing operation made it possible to reopen the May's/MD Anderson Cancer Center in May 2020 for chemotherapy and other cancer treatments, the dental school faculty practice was able to reopen in June 2020. The dental faculty practice is a 31.9-million-dollar enterprise that performs over 200,000 dental procedures a year. Testing allowed for reestablishment of elective procedures throughout the health science system including orthopedics, pulmonology, gastroenterology to name a few. The SON testing team made it possible for the University of Texas San Antonio (UTSA), a UT Health sister school, to pursue sports. UTSA's revenue stream including NCAA football, basketball, baseball, golf, tennis, and track seasons, is essential to their revenue ([Core Principles of Resocialization of Collegiate Sport: Developing Standards for Practice & Competition, July 23, 2020](#)).

D. Contact Tracing

Any employee, student, or family member of the UT Health community who tested positive for SARS-CoV-2 was called by a registered nurse from *Wellness 360* and contacts were identified. In the early days, prior to understanding the basic reproduction number (secondary cases produced by single infection) and incubation period (time from

exposure to onset of symptoms) of the virus, anyone with an exposure who was not a direct healthcare provider was instructed to quarantine. Masking and social distancing became the norm. The small number of essential personnel on campus at the time were required to be masked. Group meals and social congregation were highly discouraged. The return of students to campus for clinical education in June would challenge the efficacy of these systems, as young people were more likely to attend super spreader events. It was easier to determine "risk of exposure" as more was learned about the original strain of the virus. ID along with EHS and nursing defined "high-risk" and "low-risk" exposures. These definitions would go a long way in preventing on-campus spread as Texas entered its first major surge of the Alpha variant in late Spring of 2020. Interestingly, the University could not document one case on campus transmission until faced with the (less deadly, more transmissible) Omicron variant in the last quarter of 2021 more than 18 months after the initial infections were identified in March 2020. The contact tracing that was implemented in the earliest days of the pandemic worked.

E. Vaccination

On July 22, 2020, the Department of Health and Human Services (DHHS) and the Department of Defense (DOD) negotiated with Pfizer and BioNTech for distribution of an mRNA vaccine that was under investigation in clinical trials. If the vaccine passed phase 3 clinical trials and received EUA, distribution of the vaccine would begin in December 2020 ([American Journal of Managed Care, 2021](#)). By October 2020, the state health department had reached out to known vaccine providers encouraging application for COVID-19 vaccine. EHS worked closely with the state health department and the board of regents for the state of Texas to ensure that the health science center would obtain adequate quantities of vaccine for all employees and students. More than 20,000 vaccines were secured to cover the 11,000 students and employees with two doses of the Pfizer BioNTech COVID-19 vaccine. Storage of the vaccine would be an issue for smaller practices as it required -60 to -90 degrees Celsius storage, however, as a large research institution, UT Health, had several appropriate freezers. Nursing along with IT and EHS determined that a vaccine facility would need an assembly line-like space for registration, administration, and post vaccine monitoring. As it turned out, the SON had a building that was perfect for the flow and, as a research facility, it possessed laboratories with adequate freezer space nearby. This simple layout would become the vaccine HUB.

Vaccine arrived on December 14, 2020, with administration of the first dose on December 15, 2020. The vaccine HUB was identified not only for the University but for the entire Bexar County community. Originally scheduled to complete vaccination activities on January 26, 2021, the University President, with support from State Board of Regents, extended the vaccine HUB activities through mid-May 2021 with more than 150,000 vaccines administered by UT Health student and faculty volunteers along with clinical staff. HUB activities ended on May 12th continuing a smaller scale within physician practices, the *Wellness 360* clinics, and MMU efforts.

F. Community Outreach

Bexar County, Texas has a large, uninsured, underserved population with one in five people living in poverty (Community Health Needs Assessment, 2019) with limited access to transportation and limited trust for the medical community. Texas has the highest rate of uninsured people in the country, many of whom wait until they require hospitalization before accessing healthcare. Having security and sometimes assistance from the armed forces for vaccination support was a deterrent to undocumented residents who fear deportation at any given moment in the state of Texas. Going to vaccination sites required documents, addresses and sometimes additional personal information. Recognizing the limitations that marginalized communities in Texas face, the UT Health Department of Medical Humanities in collaboration with the SON's mobile health team, initiated community-based vaccine efforts in April 2021. Identifying communities with high burden of disease and low vaccine uptake, vaccine pop-ups were established across the community in collaboration with the city's Metropolitan Health Department. Metropolitan Health and other community partners evaluated the vaccine uptake by zip code and pop-ups were established in communities that suffered the greatest losses from COVID-19. Students and other volunteers working along with faculty from both the SON and SOM administered vaccines at over 700 events by September of 2021 administering over 28,000 vaccines.

2 | RESULTS

Operationalizing a response that met the needs of the University community during the early days of COVID-19 was managed by nursing. Interprofessional colleagues worked on the acute management of COVID-19 in hospitals. It was nursing that took the lead in implementation of a response that met the needs of the larger community. Beginning with the nurse-managed Hotline, University students, faculty, and staff were able to access personalized information that met their specific questions. It was once again clear that in every disaster, information and communication are critical to keeping people calm (Sickora et al., 2020). Over the course of 14 months, the nurse Hotline answered more than 30,000 calls and became a pillar of the University's response.

In March 2020 it was nearly impossible to access COVID-19 testing as people were returning to the US from travels around the world and other states experiencing the first COVID cases. Many had to quarantine for 2 weeks because we were unable to determine infection status. Our health science center was able to establish the testing protocol, secure the necessary supplies, and institute the process for documentation and follow-up in our electronic health record. By March 25, 2020, the SON was the first site in the city of San Antonio able to perform large-scale testing with results on the same day. Since that first day of testing, the SON has collected hundreds of thousands of tests including those that kept student-athletes in competition for our sister school UTSA. The SON's testing was extended

to include a site at the dental school to keep their operations running until vaccination was available. During the most recent Omicron surge, the SON collected two hundred tests a day for more than 6 weeks. Our nurses contact traced every positive case reported on campus for 22 months until we were hit with Omicron in December 2021. The contact tracing reported no on-campus transmissions before the fall of 2021 demonstrating that isolation practices, masking, and handwashing work.

Implementing a vaccination site was a natural fit for the nursing practice. As a vaccine site for children known to the state health department, obtaining approval to become a COVID-19 vaccination site was not difficult especially since the University had the sub-zero freezers needed for COVID-19 vaccine storage. What was not expected with establishment of the site was that our success would become a large-scale vaccine operation that administered up to 2500 vaccines a day for months. Interprofessional teams of students and faculty staffed up to 24 stations a day. By August 2020, when all our volunteer resources were exhausted, we brought in the national guard. The presence of guardsman inspired fear in community members who would no longer come to our clinics. This new barrier augmented use of the mobile vaccine operation that began in April of 2021 and continues to the present day.

3 | DISCUSSION

The COVID-19 pandemic has demonstrated the critical role of nursing in disaster management. Public health and community-based nurses are well poised to respond to man-made, natural, and public health emergencies. The activities described herein clearly demonstrate that nurses, with an understanding of disaster preparedness, can provide leadership to other disciplines when it comes to health activities that take place outside of hospitals. This is not a new phenomenon but one which has been the basis of public health nursing for more than a century.

In March 2020, searches of the literature found that nursing played a pivotal role in the response to the last significant pandemic in 1918. Lillian Wald and others worked closely with public health officials and community partners to address the needs of populations across the United States in addition to providing care in hospitals and homes. The literature reflects the challenges faced by healthcare with so many people falling ill daily and the demands that pandemic placed on nursing (Robinson, 1990; Keeling 2009; Keeling 2010; Stuart, 2020). Interestingly, in 2020 more than 100 years after the Flu of 1918, one would have thought a pandemic response would have had more order, more planning, better organization. Despite exponential improvements in communication, transportation, and science, COVID-19 immobilized the most developed and undeveloped countries in the world. Fear was universal and the ability to stay safe from the virus was elusive. In many ways, communication made the pandemic more horrifying as it was analyzed continuously and relentlessly with more questions than answers. There was no escape from the horrors even in the world's most sophisticated cities and towns. Nursing demonstrated the ability

to assess, plan, organize, implement, and evaluate a large-scale disaster response through communication, and basic infection control practices which go back to the days of Nightingale. Most importantly, despite the extraordinary communication of the 21st century, it was the basic individual communication that relieved the terror experienced by so many in the early days of the disaster.

The COVID-19 pandemic demonstrated the critical importance understanding population needs. In the pandemonium of the early days of COVID-19 we learned that even the most educated and sophisticated of healthcare providers, researchers and scholars need human connection when information is limited. Communication with people who are trusted and reliable was the most important intervention in the early days of the pandemic. Subsequently, the SON nursing Hotline team often answered 250 calls a day from members of the University Community. We quickly learned that misinformation would abound in community settings where access to information was often distorted or limited. We learned that marginalized populations that have limited access to healthcare in their day-to-day lives do not attempt to access healthcare in a crisis unless they are seriously ill. The highest burden of severe illness and the lowest uptake of vaccine occurred in the poorest and communities with the highest rates of uninsurance and mistrust of strangers. Alternatively, trusted healthcare providers with existing community relationships and the ability to address people in their native language could influence outcomes by preventing spread of infection through vaccination and other mitigation strategies. Delivering healthcare in the community, at churches, food pantries, construction sites where populations did not feel threatened led to the administration of more than 28,000 vaccines.

This report is limited by geographic location. However, the findings demonstrate the importance of providing disaster response education to nursing students and students in other health professions. There has been criticism of nursing's lack of attention to disaster preparedness. The work here validates that nursing is prepared to lead, but disaster preparedness skills need to be continuously refined for nurses and other healthcare providers. The work also demonstrates the importance of trust across the continuum of care and across populations particularly in times of extreme vulnerability and that learning how to develop population trust is fundamental skill that needs to be cultivated in students of all health professions.

DATA AVAILABILITY STATEMENT

Data available by request from corresponding author.

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