



# Recommendations for Improving National Nurse Preparedness for Pandemic Response: Early Lessons from COVID-19



**JOHNS HOPKINS**  
BLOOMBERG SCHOOL  
of PUBLIC HEALTH

**Center for  
Health Security**

## **Authors**

**Tener Goodwin Veenema, PhD, MPH, MS, RN**  
Visiting Scholar, Professor, Johns Hopkins Center for Health Security

**Diane Meyer, MPH, RN**  
Research Associate, Johns Hopkins Center for Health Security

**Sue Anne Bell, PhD, FNP-BC, NHDP-BC**  
Assistant Professor, University of Michigan

**Mary Pat Couig, PhD, MPH, RN**  
Associate Professor, University of New Mexico

**Christopher R. Friese, PhD, RN, AOCN**  
Elizabeth Tone Hosmer Professor, University of Michigan

**Roberta Lavin, PhD, FNP-BC**  
Professor, University of New Mexico

**Joan Stanley, PhD, RN**  
Chief Academic Officer, American Association of Colleges of Nursing

**Elena Martin, MPH**  
Research Associate, Johns Hopkins Center for Health Security

**Michael Montague, PhD**  
Senior Scholar, Johns Hopkins Center for Health Security

**Eric Toner, MD**  
Senior Scholar, Johns Hopkins Center for Health Security

**Monica Schoch-Spana, PhD**  
Senior Scholar, Johns Hopkins Center for Health Security

**Anita Cicero, JD**  
Deputy Director, Johns Hopkins Center for Health Security

**Tom Inglesby, MD**  
Director, Johns Hopkins Center for Health Security

Published June 10, 2020

Copyright © 2020 Johns Hopkins University

Cover photo: “Florida National Guard” by Sgt. Michael Baltz is licensed under CC BY 2.0

## Executive Summary

The rapid evolution and spread of the COVID-19 pandemic have revealed insufficiencies in the US health system to respond to a public health emergency, resulting in healthcare worker infections and deaths.<sup>1</sup> Nurses have played and will continue to play a pivotal role in the response, yet compelling evidence from nurses in the field reveals a lack of access to personal protective equipment; inadequate knowledge and skills related to pandemic response; a lack of decision rights as they relate to workflow redesign, staffing decisions, and allocation of scarce resources; and a fundamental disconnect between frontline nurses and nurse executives and hospital administrators. These issues were brought to light in a recent survey conducted by the American Nurses Association, which found that 87% of nurses fear going to work, 36% have cared for an infectious patient without having adequate personal protective equipment (PPE), and only 11% felt well-prepared to care for a COVID-19 patient.<sup>2</sup> The efforts put forth by frontline nurses in caring for patients and ensuring the sustainability of health system operations during the COVID-19 pandemic, despite these challenges, is inspiring. However, there is a critical and compelling need to identify and understand the gaps and inadequacies in the US health system that have contributed to a lack of pandemic readiness, both within and outside of the nursing workforce, including in emergency planning and the procurement and allocation of resources such as PPE and ventilators.

In this report, we describe the myriad factors that influence nursing workforce development and training for pandemic response as well as the safety and support needed during pandemics at the government, system, organization, and individual levels. In addition, we identify some of the relevant stakeholders who can influence decision making at these levels. We also identify gaps and propose short- and long-term recommendations for ways to improve the readiness, safety, and support of the national nursing workforce for COVID-19 and future pandemics. These recommendations include:

- The US Department of Health and Human Services should examine existing federal preparedness and response strategies to identify the roles and responsibilities of nurses during a pandemic (eg, medical countermeasure dispensing) and work with experts in nursing pandemic response to develop a plan for ways that nurses can train to execute these roles during a pandemic.
- Key stakeholder groups and program staff should identify each federal agency's capacity for advancing the emergency preparedness and response knowledge base in the nursing workforce and integrate this information into their subsequent strategic plans.
- Healthcare accreditors should implement metrics that measure whether a facility has the plans, procedures, and human resources needed to surge the nursing workforce during a pandemic.



- Healthcare accreditors should include education and training for nurses on pandemic preparedness as a specific requirement beyond the all-hazards approach now required to evaluate a healthcare organization's emergency preparedness.
- The Human Resources and Services Administration should fund nursing workforce development for public health emergency preparedness and response.
- Building on the model of the Centers for Public Health Preparedness and the Public Health Emergency Response Research Centers programs, the Centers for Disease Control and Prevention should fund a National Center for Disaster Nursing and Public Health Emergency Response to provide education and training, career development, and networking opportunities to early career nurse scientists and nursing students.
- Schools of nursing should develop robust metrics for evaluating nurse preparedness, which should be implemented across academic and life-long learning programming.
- The American Association of Colleges of Nursing should release revised curricular *Essentials* and a tool kit for schools and universities to facilitate the inclusion of emergency preparedness and response content across all baccalaureate and graduate academic programs.
- Hospitals should conduct and include nurses in emergency preparedness drills and exercises, such as those required by the Joint Commission, the Assistant Secretary for Preparedness and Response's Hospital Preparedness Program, and the Centers for Medicare and Medicaid Emergency Preparedness Rule.
- Hospitals should endeavor to establish and maintain crisis leadership skills in nurse administrators, managers, and executives who can help foster and champion nurse preparedness and response at the highest levels of leadership.
- The National Academy of Medicine, along with the Robert Wood Johnson Foundation and in collaboration with nursing organizations, should convene a national workshop of interdisciplinary subject matter experts in 2020 to explore the lessons learned from the national nurse response to COVID-19 and to expand and illuminate the recommendations contained in this report.

## The nursing workforce response to COVID-19

According to the US Centers for Disease Control and Prevention (CDC), more than 300 healthcare workers have died of COVID-19, and thousands more have become ill or had to self-quarantine because of known workplace exposures.<sup>3</sup> Nurses working on the frontlines report being mentally, physically, and emotionally exhausted, and they must also grapple with the fear of becoming infected themselves and of infecting their own families. Some nurses have made the difficult decision to leave the profession, having felt “expendable” when they were required to report to work without sufficient personal protective equipment (PPE).<sup>4</sup> A survey conducted in late March and early April of this year by the American Nurses Association (ANA) found that 87% of nurses fear going to work, 36% have cared for an infectious patient without having adequate PPE, and only 11% felt well-prepared to care for a COVID-19 patient.<sup>2</sup> Of the 32,000 responses, over half of nurses reported an urgent need for education on caring for COVID-19 patients, proper use of PPE, how to keep themselves safe while working, and COVID-19 testing.<sup>2</sup>

To strengthen the nursing workforce during this response and for future resurgences of COVID-19 or other pandemics and epidemics, it is critical to identify the gaps in nursing workforce development that have contributed to a lack of pandemic readiness. It is imperative that policymakers, nurse educators, and the organizations and systems that oversee and provide health care understand the unique characteristics associated with nursing’s role in healthcare and public health emergency preparedness, what activities are required to prepare the nursing workforce for these roles, and who is responsible for conducting, supporting, and maintaining those activities.

A pandemic-ready nursing workforce is one that “possesses the knowledge, skills, abilities, and willingness to respond in a timely and effective manner.”<sup>5</sup> In this report, we propose a framework that articulates the myriad factors that influence nursing workforce development and training for pandemic response as well as the safety and support needed during pandemics at the government, system, organization, and individual levels. It also identifies some of the relevant stakeholders who can influence decision making at these levels. Through the use of this framework, we identify gaps and propose several short- and long-term recommendations for policymakers and other stakeholders across government, academia, health systems (including health care and public health), and other organizations on ways to advance national nurse response capacity for COVID-19 and for future pandemics. While it is clear that the entire healthcare workforce must be strengthened to improve pandemic response, the specific purpose of this report is to spur new policies and actions to prepare US nurses for future epidemics in ways that ensure their readiness and provide them the training and tools to operate safely.

# Optimal National Framework for Preparing Nurses for Pandemic Response

## Factors

### Government

- Federal (Centers for Medicare and Medicaid Emergency Preparedness Rule)
- State
- Regulatory (state boards of nursing, state boards of medicine)

### Systems/Organizations

- Professional Accreditation Bodies (AACN, CCNE, ACEN, NLN CNEA)
- Healthcare Accrediting Bodies (Joint Commission, National Commission on Correctional Healthcare)
- Regulatory Bodies (NCSBN)
- Healthcare and Public Health Organizations (AHA, APHA)
- Institutions of Higher Education
- Professional Nursing Organizations (ANA, AAN, AANP, AONL, ENA, APHN, etc)
- Voluntary Organizations Active in Disaster (Red Cross, Catholic Charities, etc)

### Individuals

- Practicing Nurse in Healthcare Institutions
- Nursing Faculty
- Nursing Students
- Nursing Administration (deans, CNOs, etc)
- Nurse Scientists

### Legend

AACN = American Association of Colleges of Nursing

AAN = American Association of Nurses

AANP = American Association of Nurse Practitioners

ACEN = Accreditation Commission for Education in Nursing

AHA = American Hospital Association

ANA = American Nurses Association

AONL = American Organization for Nursing Leadership

APHA = American Public Health Association

APHN = Association of Public Health Nurses






















CCNE = Commission on Collegiate Nursing Education

CNO = Chief Nursing Officer

ENA = Emergency Nurses Association

NCSBN = National Council of State Boards of Nursing

NLN CNEA = National League for Nursing Commission for Nursing Education Accreditation

	Government	System/ Organizations	Individuals
Licensure (specific to federal and state emergency powers)			
Validation of disaster drills and exercises			
Validation of nursing program compliance with NLN and CCNE standards on disaster content			
Licensure and certification exams that reflect PHEPR			
Staff development in workplace settings			
Access to appropriate levels of PPE			
Curricular content in schools of nursing that emphasize PHEPR			
Clinical competence (eg, PPE use, protective actions)			
Physical, mental, and emotional wellness and personal preparedness			

## **What is the role of nurses during pandemics and other health emergencies?**

According to a 2017 survey, nursing is the nation's largest healthcare profession, with more than 3.8 million registered nurses nationwide.<sup>6</sup> The national nursing workforce consists of civilian and military nurses, nurses employed by the Department of Veterans Affairs and the US Public Health Service Corps, retired nurses, and those who work or volunteer with the National Disaster Medical System (NDMS), the Medical Reserve Corps (MRC), or the National Voluntary Organizations Active in Disasters (NVOADs). Each plays a critical role in the nation's ability to respond to and recover from pandemics.<sup>6</sup> During disease outbreaks, nurses support and inform epidemic surveillance and detection (eg, through contact tracing); work in point-of-distribution (POD) clinics to provide screening and testing and to distribute vaccines and other medical countermeasures; implement prevention and response interventions; provide direct, hospital-based treatment for patients; educate both patients and the public to decrease risk of infection; assess individual and group risk; provide health systems leadership; and counsel and console community members to allay fear and quell anxiety. The important and diverse roles nurses play in pandemic response have become clear in the ongoing COVID-19 epidemic, in which hospitals and public health agencies across the United States have struggled to identify, test, and treat more than a million and a half patients.

There were many lessons learned during the planning and response to the 2003 severe acute respiratory syndrome (SARS) coronavirus outbreak, the 2009 H1N1 influenza pandemic, the Ebola virus outbreak in West Africa, and disease containment after Hurricane Maria; these lessons should have been applied to workforce planning for future infectious disease outbreaks such as COVID-19.<sup>7</sup> Previous research has consistently documented a general lack of foundational knowledge around health system emergency preparedness among nurses, who are expected to play a critical role during a public health emergency.<sup>8-10</sup> In 2018, Spectrum Health conducted a survey of more than 5,000 nurses across its health system to examine their perceived overall familiarity with emergency preparedness and disaster response. Among the 16% who completed the survey, 78% responded that they had little or no familiarity.<sup>11</sup> Studies evaluating curricular content in US schools of nursing reveal a striking absence of healthcare emergency preparedness content and little evidence that the few students who do receive healthcare emergency preparedness instruction achieve competency in these skills.<sup>12</sup>



## What is the role of government in developing the nurse workforce for pandemics?

The federal government has broad responsibilities for emergency preparedness and response across various agencies. The Office of the Assistant Secretary for Preparedness and Response (ASPR), which is overseen by the Department of Health and Human Services (HHS), “leads the nation’s medical and public health preparedness for, response to, and recovery from disasters and public health emergencies.”<sup>13</sup> ASPR has numerous roles during emergencies, including coordinating the HHS Emergency Support Functions, overseeing NDMS, supporting the Hospital Preparedness Program (HPP), and maintaining and distributing the Strategic National Stockpile (SNS). ASPR also creates vital strategies that help identify risks and inform preparedness and response efforts, including the National Biodefense Strategy and the National Health Security Strategy. Other critical federal response strategies and frameworks include the Federal Emergency Management Agency’s (FEMA) National Response Framework and the CDC’s Public Health Emergency Preparedness and Response Capabilities, among others.

While uncertainty exists in the public health and healthcare sectors about how to define and quantitatively measure workforce and/or health systems “readiness,” existing federal strategies such as those noted above may be built on false assumptions regarding the capacity of the nursing workforce to respond to a disaster or public health emergency. Specifically, the findings of a 2016 study supported the need to conduct a thorough review of national policies and planning documents addressing disasters and public health emergencies to ensure that they elevate, prioritize, and address the practice of disaster nursing in federal, state, and local emergency management operations.<sup>9</sup> For example, the 2017-2022 Health Care Preparedness and Response Capabilities provides a framework for healthcare coalition capabilities, including healthcare and medical readiness, healthcare and medical response coordination, continuity of healthcare service delivery, and medial surge.<sup>14</sup> Importantly, many of these capabilities depend on a trained nursing workforce.

Goal 3 of the National Biodefense Strategy includes “developing and effectively distributing and dispensing medical countermeasures,” which would potentially include numerous activities within the nursing scope of practice, such as vaccine administration.<sup>15</sup> However, training and maintaining the nursing workforce necessary to effectively dispense medical countermeasures remains a critical vulnerability that may become particularly salient in mass vaccination efforts for the COVID-19 pandemic, should a vaccine become available. Thus, additional clarity is needed around what roles and responsibilities nurses are expected to fulfill within existing federal preparedness and response strategies; the knowledge, skills, and abilities needed to execute those roles safely; and ways to build and maintain them in the nursing workforce.

There are a range of federal responsibilities critical to safe nursing practice. For example, the CDC is responsible for issuing updated and evidence-based guidance for healthcare workers, hospitals, health departments, and the public on a variety of topics, including PPE use and infection control. The federal government has stood up an interagency Healthcare Resilience Taskforce under the National Response Coordination Center that has issued waivers and extended flexibilities, monitored for healthcare worker shortages in COVID-19 hotspots, and worked with the Department of Defense to coordinate the deployment of military assets as necessary. ASPR, which functions from the perspective that the “workforce is best managed at the local level,” has created a Workforce Virtual Toolkit through the Technical Resources, Assistance Center, and Information Exchange (TRACIE) platform that can be used by decision makers to help with education and training for the COVID-19 response, including “upskilling” to meet the demand for critical care nurses.<sup>16</sup> However, because ASPR traditionally organizes responses to more local or regional events, such as hurricanes, COVID-19 has revealed challenges for ASPR in deploying assets such as the National Disaster Medical Assistance Teams during a global pandemic.

In addition to their role as technical experts, ASPR has also provided over \$350 million to healthcare systems to help them prepare for COVID-19 cases.<sup>17</sup> However, to our knowledge, none of those funds have been specifically earmarked for nursing workforce development and training. Additionally, ASPR has announced no new initiatives addressing nursing workforce development for this or any future pandemic response.

Other federal agencies relevant to nursing practice and workforce development include the Health Resources and Services Administration (HRSA) and the Department of Labor’s Occupational Safety and Health Administration (OSHA). HRSA funds nursing education grants to support and increase the nursing workforce. Their programs are not specifically related to pandemics but help to support the nursing workforce for primary care providers, for underserved populations, to enhance nursing education, to improve the quality of patient care, and to increase nurse retention.<sup>18</sup> OSHA is responsible for “. . . ensur[ing] safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.”<sup>19</sup>

Specifically, OSHA requires employers to provide training for employees who need to wear PPE to protect themselves from workplace hazards that can cause injury or illness. Employees must be informed about when PPE is necessary; what PPE is necessary; how to properly don, doff, adjust, and wear PPE; the limitations of PPE; and the proper care and disposal of the PPE. Additionally, employers are required to have each employee demonstrate his or her ability to properly use PPE.<sup>20</sup> Employers must comply with OSHA or OSHA-approved state plans with respect to safety and health standards and regulations.<sup>21</sup> OSHA also contains a general duty clause that specifies that employers “shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.”<sup>22</sup> However, there is no national program, process, or

strategy for managing the entire PPE supply chain and ensuring equitable distribution across public and private hospitals. During the COVID-19 pandemic, HHS and the Department of Homeland Security (DHS) have struggled to help hospitals source PPE but these efforts were ad hoc and created on the fly. This, in addition to reports of lack of enforcement of workforce protection standards, have left nurses vulnerable to infection during the COVID-19 pandemic.<sup>23</sup>

### **Short-term Recommendations**

- Congress must pass emergency legislation to protect healthcare workers who are at high risk of exposure to COVID-19. This should include financial protections for healthcare workers who contract COVID-19 and should direct OSHA to develop additional safety requirements for healthcare facilities.
- The executive branch, Congress, and the private sector should work together to create a system to continuously track PPE supply chains and to facilitate rapid manufacture and equitable distribution of PPE at the very start of a new epidemic so as to prevent the critical shortages of PPE experienced in the COVID-19 pandemic.

### **Long-term Recommendations**

- HHS should strengthen the HPP to include a more focused effort on preparing and protecting the nursing workforce during pandemics.
- HHS should examine existing federal preparedness and response strategies to identify the roles and responsibilities of nurses during a pandemic (eg, medical countermeasure dispensing) and work with experts in nursing pandemic response to develop a plan for how nurses can train to execute these roles during a pandemic.

## **What impact has federal funding for healthcare emergency preparedness research had on readiness of nurses for pandemics?**

As a science-based discipline, clinical nursing practice is informed by theory and empirical research. A robust evidence base is essential to deliver safe and high-quality nursing care to patients and communities affected by a public health emergency, yet data suggest that this evidence base is underdeveloped.<sup>24</sup> A historic portfolio analysis suggests that, in contrast to other health problems, research funding for healthcare emergency preparedness has been sporadic and uneven. For example:

- From 2004 to 2010, the CDC funded 27 Centers for Public Health Preparedness (CPHP), all located in schools of public health, to assess training needs and deliver competency-based training, education, and technical assistance and to provide a nexus for applied research related to workforce development.<sup>25</sup> Additionally, from 2008 to 2013, after the 2006 enactment of the Pandemic and All-Hazards Preparedness Act, the CDC funded 9 Public Health Emergency Response Research Centers (PERRCs), which resulted in 34 completed research projects and more than 137 peer-reviewed publications.<sup>26</sup> Of the 9 PERRCs established, only 4 of them included nursing.<sup>27</sup> An interim evaluative report recommended that the funded PERRCs increase the diversity of participating disciplines, boost training and professional development of early career investigators, and partner more closely with healthcare delivery organizations.<sup>28</sup> However, there is no evidence that these recommendations were incorporated into the funded grantee’s scope of work. Finally, after review of the CDC’s 2019 total funding portfolio, only approximately 8% of the portfolio was dedicated to public health preparedness and response.<sup>29</sup>
- The National Institute of Nursing Research (NINR), whose mission includes developing “the scientific basis for clinical practice,” does not include public health emergency preparedness and response research or training in the 2016 strategic plan.<sup>30</sup> A portfolio analysis conducted through the National Institutes of Health (NIH) RePORTER revealed no research project grants or training awards are currently being funded by NINR with the search terms *disaster*, *public health emergency*, *Ebola*, *H1N1*, *SARS*, or *pandemic*.<sup>31</sup> Searching across all available fiscal years, only 13 out of 2,814 awards included any of these search terms. A similar portfolio analysis of the Agency for Health Care Research Quality (AHRQ), which supports health services research to improve healthcare quality in the United States, yielded no current research or training grants in public health emergency preparedness and response, including grants related to nursing.
- The Patient-Centered Outcomes Research Institute (PCORI), a 501(c)(1) agency established and funded as part of the Affordable Care Act, supports informed healthcare decision making and improved healthcare delivery and outcomes through research developed in partnership with patients, researchers, and other key stakeholders.<sup>27</sup> PCORI’s searchable database yielded 1 project funded in 2020 with the search term *pandemic*.

Taken collectively, this brief portfolio analysis suggests that little funding is available to support research for pandemic planning in the nursing field, including for the training and career development of nurse scientists, who are critical to strengthening the evidence base and improving the delivery of nursing care during a pandemic. This lack of funding limits the development and delivery of evidence-based nursing practice during pandemics, as outlined in this report’s corresponding sections.

Recently, PCORI, AHRQ, NIH, and other funders have launched robust funding opportunities to address the COVID-19 pandemic. For example, in April, PCORI launched the Healthcare Worker Exposure Response and Outcomes research program to establish a registry of healthcare workers and to test preventive strategies against COVID-19.<sup>32</sup> These funding opportunities have short deadlines and are intended to generate immediate results to guide response. Similar rapid-fire funding opportunities were issued during the H1N1 pandemic and Ebola and SARS outbreaks. While this kind of research is indeed needed now, these types of awards do not often build transdisciplinary science or support early career investigators. Thus, it is also important to establish sustained funding for development of long-term study and practice.

### **Short-term Recommendations**

- The American Academy of Nursing (AAN) should convene an emergency commission, comprised of members of the academy's expert panels on Acute and Critical Care, Emerging Infectious Diseases, Environmental and Public Health, and Quality Health Care to prioritize research topics and disseminate a white paper outlining key questions on pandemic readiness for nurse scientists to address in the next 24 months. Such topics should include willingness to work, nurse safety and training for pandemics, and mental health support.
- The NINR should issue a request for information on key research questions that could be addressed via administrative supplements to existing grants and Notice of Special Interest calls across all new grant proposals.

### **Long-term Recommendations**

- Key stakeholder groups and program staff of each federal agency should identify its capacity for advancing the emergency preparedness and response knowledge base of the nursing workforce and integrate this information into their subsequent strategic plans.
- NINR should lead efforts to host an annual state of the science workshop on pandemic readiness of the nursing workforce and develop program announcement concepts to address key research questions.
- Building on the model of the CPHP and PERRC programs, the CDC should fund a National Center for Disaster Nursing and Public Health Emergency Response to provide education and training, career development, and networking opportunities to early career nurse scientists and nursing students.
- HRSA should fund nursing workforce development for public health emergency preparedness and response.



## What is the role of healthcare accrediting bodies in developing the nurse workforce for pandemics?

The role of healthcare accreditors is to evaluate a healthcare organization's compliance and compare it with preestablished performance standards.<sup>33</sup> Healthcare accreditors use an external process of peer review, and they are considered a necessary means of ensuring safe and effective care that is of the highest quality and value.<sup>34</sup> The Joint Commission, which operates as a nonprofit organization, is perhaps the best-known healthcare accrediting body in the United States, but a number of other accrediting organizations exist to perform the same function. The Joint Commission has a long-standing interest in nursing workforce issues, viewing these as a vital part of its mission to support high-quality and safe care. It has taken action to support the nursing workforce through recommendations to promote a safe working environment, to increase the professionalism of nursing, to diversify the nursing workforce, and it has implemented measures to improve the safety and quality of nursing care practices.

Healthcare accreditors have more recently focused on measures to ensure emergency preparedness. In 2017, the Centers for Medicare and Medicaid Services (CMS) enacted the emergency preparedness rule, which established requirements for planning, preparing, and training for emergency situations.<sup>35</sup> Compliance with the emergency preparedness rule is required by CMS in order to participate in Medicare and Medicaid programs, so most healthcare organizations have taken steps to comply.

The emergency preparedness rule is based on an “all-hazards” approach, in which emergency planning should be flexible and scalable enough to adapt to a wide variety of disasters but also targeted toward the hazards most likely to affect an individual facility and community. In February 2019, the rule was amended to expand the all-hazards approach to include emerging infectious diseases.<sup>36</sup> This amendment identified—but did not change requirements for—basic care and treatment of patients with emerging infectious diseases, segregation and isolation of patients, infection control, waste management, and PPE as areas at issue. The goal of the emergency preparedness rule is to create prepared healthcare organizations whose workforces have received adequate training in the policies, procedures, and plans that could be carried out in the event of an emergency. Built around 4 main requirements, the emergency preparedness rule requires that organizations develop and regularly evaluate: (1) risk assessment and planning for emergencies, (2) policies and procedures for emergency planning, (3) a communication plan for emergencies, and (4) training and testing programs for all staff.<sup>37</sup>

The CMS emergency preparedness rule, which is required by most healthcare accreditation bodies for participation in Medicare and Medicaid programs, is an important contribution to healthcare preparedness, but it does not ensure nursing workforce preparedness. The emergency preparedness rule was designed to promote preparedness at the healthcare organization level, allowing the organization flexibility in testing and training for staff, including nurses. This was designed to support healthcare

organizations' ability to determine their own needs, leaving the responsibility of verifying staff knowledge and uptake to each health-care organization. Accreditors ensure that the criteria are met, but they do not evaluate the level of knowledge staff have or require additional training or workforce development. This could lead to potential gaps in nursing healthcare emergency preparedness within these organizations, even if they have met the CMS emergency preparedness criteria.

Maintaining safe staffing levels is a key component of ensuring workplace safety during a pandemic and should be a consideration in the development of a workforce pandemic strategy. While the Joint Commission does not specifically require reporting of nurse-to-patient ratios, it does have some metrics related to this around patient outcomes.<sup>38</sup> Lack of metrics that specifically measure whether a facility has the plans, procedures, and human resources needed to surge the workforce during a pandemic leaves them vulnerable to staffing shortages and increases the likelihood that they will need to turn to a crisis standards of care staffing model.

Healthcare emergency response frequently requires registered nurses to move within states and across states borders. Regulations related to licensure, certification, and scope of practice vary from state to state. This variation in the regulatory environment may affect nurses' participation in healthcare emergency response, as evidenced by nurses who traveled to the greater New York metro area during the COVID-19 outbreak. Many states implemented executive orders that temporarily altered regulations and scope of practice for nurses and advanced practice nurses. However, these actions varied from state to state. Standardized regulations from accreditors for nursing practice during a disaster or public health emergency would facilitate rapid action by governors and regulatory bodies after an emergency declaration.

### **Short-term Recommendations**

- Healthcare accrediting bodies should provide guidance to healthcare organizations for just-in-time training targeted at the onset and response period of a disaster or emergency, including during the COVID-19 pandemic.
- Healthcare accreditors should implement metrics that measure whether a facility has the plans, procedures, and human resources needed to surge the workforce during a pandemic.
- State legislatures must adopt legislation (such as the Nursing Licensure Compact and Model Advanced Practice Registered Nurse Compact legislation) that will remove regulatory variability over nurse licensure and allow registered and advanced practice nurses to be rapidly mobilized and deployed across state lines during pandemics.

### Long-term Recommendations

- Undertake an after-action review, conducted by healthcare accreditors, of healthcare organizations' readiness for the COVID-19 pandemic on an individual hospital level as well as a health system level.
- Healthcare accreditors should include education and training for nurses on pandemic preparedness as a specific requirement beyond the all-hazards approach now required to evaluate a healthcare organization's emergency preparedness.
- Healthcare accreditors should promote disaster and emergency preparedness as a core component of nursing education in order to produce nurses who are prepared to address future pandemics and other large-scale public health emergencies.

## **What is the role of institutes of higher education and professional nursing education organizations in developing the nurse workforce for healthcare emergency preparedness?**

Schools of nursing are responsible for ensuring that their graduates possess the knowledge, skills, and abilities to provide safe, high-quality care to meet the health needs of the public, including pandemic response. Schools of nursing have traditionally resisted including core content on disasters and public health emergency response in nursing curriculum, and rarely have nursing education frameworks adequately addressed pandemic response.<sup>39</sup> After the 9/11 and 2001 anthrax attacks, the National Student Nurses Association passed a resolution calling for the inclusion of disaster preparedness content in the nursing curricula. There was interest by several schools of nursing in adding core competencies for nursing response to emergencies; however, these efforts were short lived.<sup>40</sup>

Vanderbilt University received federal funding to convene a coalition of nursing educators and representatives from professional organizations to establish the International Nursing Coalition for Mass Casualty Education. In 2003 the coalition published educational competencies for registered nurses responding to mass casualty incidents. While the competencies included disasters and biological events such as acts of terrorism, they did not specifically address infectious disease outbreaks. They did, however, establish a national model for competency-based curriculum development and raised awareness of the importance of inclusion of this content.

Several schools of nursing went so far as to develop degree-granting programs and certificates in healthcare emergency preparedness, but these programs disappeared due

to a lack of funding. There are multiple reasons why schools of nursing may choose not to include or to limit the amount of their healthcare emergency preparedness content, including increases in overall healthcare content and growing pressure to continually expand the curriculum. In addition, schools may not have faculty with the subject expertise or experience to teach and conduct drills, academic administrators may lack appreciation or perception of risk of pandemics, and external forces may have an impact on the national nursing education enterprise.

In 2011, the Institute of Medicine (IOM, now the National Academy of Medicine) released a report titled *The Future of Nursing: Leading Change, Advancing Health*, which contained recommendations to “strengthen that nursing’s workforce capacity to ‘meet the demands of a reformed health care and public health system.’”<sup>41</sup> Following the release of the report, schools of nursing made significant investments to revise academic programming in rapid response to 2 of the report’s recommendations: (1) increase the proportion of nurses with a baccalaureate degree to 80% by 2020, and (2) double the number of nurses with a doctorate by 2020. The only reference to public health emergency preparedness in the report was in a case study of a school nurse who first identified the H1N1 outbreak and in vaccination programs for tuberculosis.<sup>41</sup>

Although it was heralded as a landmark report at the time of its publication, the IOM report’s recommended actions have been slow to materialize, and some unintended consequences have resulted from the translation of the recommendations into practice. Schools of nursing moved to create accelerated bachelor of science in nursing (BSN) and master of science in nursing (MSN) programs with condensed curricula, resulting in less time in the curriculum for what might be deemed “nonessential” content. This may have contributed to effectively eliminating healthcare emergency preparedness and many other public health nursing topics. Many schools focus exclusively on preparing graduates for the National Council Licensure Exam.

As for the impact of the *Future of Nursing* recommendations, in 2010, 49% of the nation’s registered nurses had a baccalaureate degree, and by 2018 that number had increased to only 57%.<sup>6</sup> In 2010, less than 1% of the nation’s registered nurses had a doctoral degree, and by 2018 only 1.9% of nurses held a doctoral degree as their highest educational preparation.<sup>6</sup> Subsequent evaluations of the *Future of Nursing* report cite that “amplified efforts are needed to attain the IOM goal of 80% of RNs having BSN or higher education by 2026, or even by 2030,” and efforts are needed to build a broader coalition to increase awareness of nurses’ ability to play a full role in health professions practice, education, collaboration, and leadership.<sup>42,43</sup> While schools of nursing have increased the number of doctorate of nursing practice (DNP) graduates, this accomplishment may have had an unintended inverse effect on the number of PhDs being produced. Greater efforts are needed now more than ever to increase the numbers of doctoral-level faculty, to teach and conduct healthcare emergency preparedness research, and to advocate for the inclusion of this content.

Despite many attempts to advocate for the inclusion of competency-based disaster preparedness and response education in nursing curricula, studies have repeatedly shown that the majority of the nation's nursing students and nurses are inadequately prepared to respond to the complex demands of disasters and public health emergencies.<sup>8,44-48</sup> In a 2019 workforce improvement project, researchers found that nurse practitioner, public health, and medical/osteopathic students all reported low curricular coverage of public health emergency preparedness content as part of either their academic training or in continuing education requirements.<sup>12</sup> The students also reported low confidence in their ability to perform 15 related response behaviors, such as maintaining preparedness plans, using risk communication, and contributing to the development of emergency plans.<sup>12</sup> Among all students, nurse practitioner students scored the lowest on academic curriculum coverage of public health emergency preparedness and response. Although the CDC project focused on advanced practice registered nurses, it could be expected that pre-licensure nursing students would report similar findings. While schools of nursing consistently teach the basics of infection control and prevention, what is frequently absent is education around concepts in public health emergency response, disease surveillance and containment strategies, and mass vaccination operations (eg, through the POD system) and instruction regarding the proper selection and use of PPE. Thus, new graduates enter the profession already lacking critical knowledge to keep themselves and their patients safe.

The American Association of Colleges Nursing (AACN) is the “voice” of academic nursing and sets the standards for curriculum for academic nursing programs. Using a national consensus-based process, AACN developed a series of *Essentials* documents that outline expectations for graduates of baccalaureate, master's, and doctoral nursing programs.<sup>50</sup> Using these documents, schools of nursing are able to ensure they adhere to the highest standards for their education programs and meet accreditation guidelines. The current BSN *Essentials* document calls for nurses to “use clinical judgment and decision making skills in appropriate, timely nursing care during disaster, mass casualty, and other emergency situations, and to understand one's role and participation in emergency preparedness and disaster response with an awareness of environmental factors and the risks they pose to self and patients.”<sup>49</sup> The MSN *Essentials* document refers to disaster preparedness as an example under simulation and under sample content with clinical prevention and population health as “disaster preparedness and management.”<sup>50</sup> In the DNP *Essentials* document, the only mention is “emergency/disaster preparedness” listed as part of what frames the DNP graduate's knowledge of clinical prevention and population health.<sup>51</sup> These documents are currently being revised, with a targeted release in early 2021. This new document is intended to transition nursing education to competency-based education, with the goal of being able to document what graduates at both the entry-into-professional and advanced levels of nursing practice can do, rather than what they have been taught.

The Commission on Collegiate Nursing Education (CCNE), 1 of the 3 national nursing accrediting bodies, currently accredits 85% of the baccalaureate, master's, and DNP programs in the United States. The CCNE Standards & Professional Nursing Guidelines Standards for Accreditation of Baccalaureate and Graduate Nursing



Programs are employed at accreditation site visits to schools of nursing.<sup>50</sup> Evaluators are required to ensure that the program prepares graduates with the expected *Essentials* outcomes. What is unclear is whether evaluators ask about disaster and public health emergency preparedness and response content. Anecdotally, nursing faculty report that this rarely occurs. If this content were being taught or even “threaded” across programs, evaluation of student learning and CCNE confirmation of these activities would produce evidence of graduates’ clinical competence in this arena. Recognizing that new nurse graduates need reinforcement of what they learned in school to establish clinical competence and keep knowledge fresh, lifelong learning in the workplace becomes critically important. Continuing education requirements for practicing professional nurses following graduation vary from state to state and show poor uniformity, and none at present requires public health emergency preparedness and response.<sup>52</sup>

Finally, the COVID-19 pandemic has resulted in schools of nursing being forced to temporarily suspend clinical placement for students, which has interrupted academic advancement and postponed graduations. Going forward, conversations between schools of nursing and state boards of nursing should explore alternative options to support clinical rotations in the healthcare setting, such as expanding the role of virtual or simulated learning. This can help ensure that academic programs continue during public health emergencies. Additionally, many schools of nursing have donated PPE to the response efforts, and additional funding will be required to ensure students have access to PPE for education and clinical rotations.

### **Short-term Recommendations**

- Schools of nursing should develop and implement robust metrics for evaluating nurse preparedness and apply them across academic and lifelong learning programming.
- State boards of nursing should establish a requirement for continuing education for public health emergency preparedness and response.
- Schools of nursing, in collaboration with state boards of nursing, should develop a plan for the continuity of clinical education during public health emergencies to ensure the integrity of the nursing workforce.

### **Long-term Recommendations**

- AACN should release revised curricular *Essentials* and a tool kit for schools and universities to facilitate the inclusion of emergency preparedness and response content across all baccalaureate and graduate academic programs.
- CCNE, the Accreditation Commission for Education in Nursing, and the Nursing Commission for Nursing Education Accreditation, the 3 nursing accrediting bodies, should require the inclusion of teaching and simulation on emergency preparedness and response.

- Academic nursing should formulate a proactive response to the changing infectious disease landscape by offering certificates and digital badges in emergency preparedness and response.

## **What is the role of hospitals and healthcare and public health organizations in nursing workforce development for emergency preparedness and response?**

### ***Address Nurse Staffing Shortages and Surge Capacity***

Hospitals and health departments are responsible for ensuring that their nursing workforce is adequately staffed and provided the supplies, training, and organizational support necessary to fulfill their roles during a public health emergency. The US nursing workforce, while historically plagued with periodic and geographical staffing shortages, is currently changing in several significant ways. These changes contribute to the challenges of adequate staffing for hospitals. More than 1 million baby-boom nurses are on their way to retirement, leaving an experience gap between them and the predominantly millennial nurses replacing them. Between 2010 and 2017, the number of nurse practitioners in the United States more than doubled, from approximately 91,000 to 190,000. This dramatic growth in the number of nurse practitioners has reduced the number of registered nurses in the nursing workforce by approximately 80,000; the number is further reduced by recent nursing graduates returning to school to begin graduate programs.<sup>53</sup> Additionally, it is unclear what impact COVID-19 will have on the nursing labor workforce.

From an operating perspective, nurses are often viewed as expenses rather than critical components of the practice team, as evidenced by this poignant quote from a study looking at nursing job satisfaction:

Nurses are viewed as an expense. . . . I think it [happens in inpatient settings] also, but specifically when I get that feeling as an outpatient nurse; we don't generate revenue, we can't bill for our services, and so I think that's why we are working so short. They need to get another nurse and you're adding their salary. If you have another MA [medical assistant], they are a lot less expensive than a nurse but they can't function like we do.<sup>54</sup>

A chronic shortage of nurses, coupled with the limited operating budgets of hospitals and public health departments that are often looking to cut costs by cutting staffing numbers, has contributed to a nursing workforce that was unprepared to surge to meet the demands of the COVID-19 pandemic. The ANA survey mentioned earlier found that 64% reported working short staffed and 33% reported surge staffing as an urgent need.<sup>2</sup> These staffing deficiencies have been echoed by governors from several hard-hit states, including New York and Michigan, who have pleaded for additional nursing support.

Interestingly, other less-affected locations have had to furlough nurses, indicating that there are both inequities in the distribution of nurses and geographic differences in the incidence of the disease.

Additionally, funding for public health has for years been well below what is needed to prepare and respond to emergencies such as the ongoing coronavirus pandemic—for example, according to Trust for America’s Health, public health spending in the United States in 2017 accounted for only 2.5% of all health spending.<sup>55</sup> These funding deficits have left public health nursing positions “underfunded, left vacant, eliminated, or replaced in the past three decades.”<sup>56</sup> This has created gaping holes in the ability of public health departments to respond to outbreaks, as public health nurses fill a wide range of critical tasks. For example, public health nurses are playing a pivotal role in the COVID-19 response, including “serv[ing] on mobile strike teams investigating case-contacts, deliver[ing] education on self-isolation and quarantine through hotlines and home visits, and interpret[ing] the rapidly shifting guidance from the CDC.”<sup>56</sup> Additionally, under-resourced health departments have had to divert staff from other services such as maternal child care to the response, which could further exacerbate the secondary impacts of the outbreak.<sup>56</sup>

Unfortunately, as the number of COVID-19 cases in the United States has soared toward 2 million at the time of this writing, nurses have taken on greater and greater responsibilities, putting both themselves and their patients at risk. Previous studies have identified associations between hospital-acquired infections and high patient-to-nurse ratios, indicating that this may also be a variable in the nosocomial transmission of COVID-19 in US hospitals (particularly when coupled with insufficient infection prevention and control training and PPE shortages).<sup>57-60</sup> Nurses who routinely work in hospital operating rooms or other specialty areas have been reassigned to care for COVID-19 patients in environments with which they are not familiar. Some healthcare workers, including nurses, have expressed concern that these redeployments could prevent them from providing adequate patient care.<sup>61</sup> Additionally, lack of existing hospital surge capacity and the establishment of satellite treatment facilities that have added thousands of hospital beds (such as NYC’s Javits Center) have necessitated additional outside resources, such as temporary nurses, who frequently require additional onboarding to become fully functional in a new environment. However, these resources are finite, and many hospitals in the same geographic locale may rely on the same pool of nurses for support, further compounding shortages.

Nursing, particularly in an intensive care unit (ICU) setting, requires highly specialized skills that take years of education and training to acquire. Creating substantial surge capacity in nursing, particularly ICU nursing, poses challenges to the healthcare system. In order to create such capacity, an “expertise migration” approach might be considered. It would be much easier to prepare a nurse with 10 years of emergency department (ED) experience to supplement an overworked pandemic ICU workforce than to educate and train a newly graduated nursing student, because the ED nurse has a decade of general experience to contextualize the new training. In the event of a pandemic, it may be advantageous to redeploy nurses with relevant experience and

skills to the front lines and backfill their positions with nurses proximal to their former positions. The advantage of this strategy is that it relies on the hard-won expertise and experience already in the workforce, rather than trying to prepare professionals de novo overnight. There are, however, challenges to this model. Chief among them are a lack of confidence and expertise in the nurses migrating to new specialties and the need to ultimately backfill the other positions.

Cross-training can address these challenges by transferring knowledge to the redeployed nurses from the already-deployed nurses. This might include a period of clinical apprenticeship or shadowing, in which a newly redeployed nurse shadows a nurse already experienced in the role. Such shadowing and skill transfer need not be strictly a pandemic response activity but could be envisioned as continued education and career development activities. As such, ICUs and EDs should have a set of procedures and materials in place to aid in pandemic redeployment. This model of ongoing nursing continuing education and pandemic preparedness reconceptualizes the experienced nurse as a generalist who, while perhaps specialized for his or her day-to-day position, is nonetheless broadly competent in many areas and thus is more easily redeployed in an agile manner.

As a broad range of professions have come to require more technical knowledge, there has been a trend for greater worker specialization rather than generalization, but this is not an inevitable or unalterable pattern. One example of an industry that has resisted this trend is the US maritime services, particularly the Coast Guard. The US Coast Guard has codified into law and DHS regulations that all sailors must engage in shipboard familiarization such that any sailor can perform basic aspects of emergency response and operation of the vessel beyond the specific special duty that is their main occupation.<sup>62</sup>

Positions typically filled by novice nurses might be handled by relying on the existing MRC infrastructure or, perhaps, incentives might be created to gain and maintain minimal point-of-care expertise in individuals from the general public. For example, one might imagine a tax incentive being offered to anyone who had completed a set of medical response and point-of-care classes, equivalent to a minor in college, and who maintained this competency by passing a yearly certification exam. Such an incentive would create a large base of minimally competent individuals who might be called on in an emergency to supplement minor roles so that more qualified nurses might be redeployed for higher-level care requirements.

## ***Address Gaps in Commitments to Emergency Preparedness and Response***

Several healthcare system capacities have been identified in the literature as being important to increasing healthcare worker willingness to respond to emergencies and, thus, overall surge capacity. For example, 1 review identified a number of “strategies supported by research that could increase response, such as promoting pre-event

plans for dependents at home; ensuring the supply of PPE, vaccines, and antiviral drugs for all employees; ensuring nursing representation on all disaster preparedness planning committees; assigning specific roles to nurses; and providing regular ongoing interprofessional disaster education, training, and drills.”<sup>9</sup> Clear and honest communication between hospital leaders and employees around risk, roles, and “plans to be enacted to minimize exposure” have also been identified as critical to healthcare provider willingness to respond.<sup>63</sup> Unfortunately, many hospitals have not made clear their commitment to workforce safety during this response—for example, a study of healthcare workers found “uncertainty that their organization will support/take care of their personal and family needs if they develop infection” and “lack of access to up-to-date information and communication” as key drivers of anxiety levels early on in the response.<sup>62</sup> The ANA survey referenced previously found that 87% of nurses were “very or somewhat afraid to go to work,” more than 50% reported PPE access issues, and 43% have had to make their own PPE, again indicating gaps in workplace safety that could further hinder surge capacity.<sup>2</sup>

There are often limitations on the mental health support systems available to nurses during crises, which can lead to long-term psychological impacts. Hospitals should ensure that they have systems in place to support nurses, such as access to crisis counseling, to help reduce nurse burnout, increase the retention of staff, and most importantly, care for those whom we depend on to care for others.

Vaccination of healthcare workers during a pandemic is also critical to protecting the workforce and preventing further disease transmission within the community. Unfortunately, research conducted during the H1N1 influenza pandemic found significant differences between nurses and doctors in the uptake of the pandemic vaccine, and it identified several factors that might influence whether a healthcare worker decides to receive the vaccine.<sup>64</sup> Some of these factors included whether they view vaccination as a “professional obligation,” whether vaccination is mandatory for employment, and concerns about vaccine side effects.<sup>64</sup> Many of these concerns will likely be mirrored if a COVID-19 vaccine becomes available; thus, it is essential that hospital leaders start identifying ways to address these concerns now. This can not only help improve vaccination rates among healthcare workers once a vaccine becomes available but can also ensure a well-informed workforce that can serve as educators for patients and the community. Additionally, prioritizing healthcare workers for vaccination should a COVID-19 vaccine become available (such as was done during H1N1) could help improve vaccination rates in this population and also demonstrate a national commitment to protecting those on the frontlines.

### ***Address Gaps in Hospital-Based Continuing Education***

Hospital leaders must also recognize their important role in supporting the continuing education of nurses around a variety of topics, including disaster preparedness and response. Unfortunately, the COVID-19 outbreak has exposed critical gaps in hospital-based workforce development and training, particularly around proper infection prevention and control measures, which has undermined efforts to stop further



transmission. For example, a survey released by National Nurses United in March 2020 found that only 63% of reporting nurses had been trained on how to properly don and doff PPE in the past year.<sup>65</sup> Hospitals have an obligation to train all healthcare providers on proper infection prevention and control measures to protect not only themselves but the patients they come into contact with. Poor staff training in infection prevention and control has been implicated in previous infectious disease outbreaks across the globe, including SARS, MERS, and Ebola.<sup>66</sup> Lack of consistent adoption of crisis standards of care across organizations and communication of these policies to nursing staff has also been cited as a gap that can “limit nurses’ effectiveness in response and recovery.”<sup>9</sup>

Functional exercises and drills can help all participants involved better understand their roles and responsibilities during an emergency, yet hospital budget cuts have limited their size and scope.<sup>67,68</sup> While those hospitals that receive CMS funding are required via the emergency preparedness rule to conduct exercises, nurses may not always be adequately represented, leaving gaps in response capabilities. For example, large-scale vaccinations will be critical to mitigating this and future pandemics, and vaccine administration typically falls directly within the nursing scope of practice. Thus, it is critical that exercises and other hospital-based continuing education programs includes training for nurses on mass vaccination operations (eg, use of PODS) to help ensure that the nursing workforce is ready to safely and quickly vaccinate the population should a vaccine be available.

### ***Address Gaps in Crisis Leadership and Decision Making***

Strong crisis leadership during a pandemic response is critical to effectively managing the surge in patients requiring care and ensuring the continued capacities of hospital operations. Crisis leadership is most effective when decisions are made based on available evidence and with a multidisciplinary collaborative approach that encourages the representation of all voices, not only those traditionally responsible for decision making. Yet, despite the central role nurses play on the frontlines of disasters, nurses’ voices are often underrepresented in hospital administration and they can lack involvement in decision making that has a direct impact on their work and safety.

Implementation of emergency operation plans and incident command system protocols are ultimately subject to hospital leadership decision making at the service and unit levels. These decisions have the potential to directly affect staff and patient safety, quality of care, and, ultimately, patient outcomes. However, despite the critical nature of emergencies, nurse leaders and administrators receive little education regarding leadership and decision making during disaster events.<sup>69</sup> Importantly, decision making during emergencies requires the input of nurses, who are uniquely positioned to understand the nuances of staff needs and changes that can be made to enhance clinicians’ ability to provide care to patients. Decision making that is sensitive to the needs of frontline nurses is integral to an effective institution-wide response to a disaster.

In the current crisis, the participation of nurses in leadership and decision making is desperately needed; the voices of nurses are important alongside those of physicians, emergency managers, and hospital administrators to ensure that the care provided to patients is of high quality and safe for healthcare workers. It will be challenging to remedy the distrust and betrayal many frontline nurses feel as a result of not being adequately protected by their institutions during the COVID-19 pandemic without nursing leaders at the table. Hospital leadership must reflect the interdisciplinary nature of bedside medical care, and until that happens, the lack of representation will contribute to policies that do not represent the interests of nurses and other healthcare workers and will hinder the attainment of the best possible health system environment for providing and receiving health care during emergencies.

### **Short-term Recommendations**

- Health systems should provide rapid testing for COVID-19 to all healthcare workers.
- To protect and sustain the nursing workforce for the duration of the COVID-19 response, hospitals should carefully consider clinical duties, adjust nurse assignments to meet demand, and identify additional pools of nurses who can aid in the response.
- Health system leaders should develop pandemic response plans that address the ways they will train, communicate with, and protect their workforce.
- The federal government should establish and fund a National Nursing Pandemic Response Corps to support efforts to contain the pandemic. Using the AmeriCorps program as a model, nursing students, nursing faculty, and recently furloughed nurses could be hired for 1 year of public health service to assist with testing, contact tracing, health education, and medical countermeasure distribution.

### **Long-term Recommendations**

- The federal government should increase healthcare spending aimed at growing and stabilizing the nursing workforce.
- Hospitals should conduct and include nurses in emergency preparedness drills and exercises, such as those required by the Joint Commission, ASPR's Hospital Preparedness Program, and the CMS emergency preparedness rule.
- Hospitals should enhance awareness and adoption of crisis standards of care.
- Hospitals should endeavor to establish and maintain crisis leadership skills in nurse administrators, managers, and executives who can help foster and champion nurse preparedness and response at the highest levels of leadership.

## What is the role of voluntary organizations in nurse workforce development for emergency preparedness and response?

National Voluntary Organizations Active in Disasters (NVOADs) acts as a “forum for sharing knowledge and coordinating resources—money, materials, and manpower—throughout the disaster cycle” and includes several well-known volunteer organizations, including the American Red Cross and Catholic Charities USA.<sup>70</sup> These organizations have played critical roles in emergencies across the United States, including natural disasters, infectious disease outbreaks, and terrorist attacks. Healthcare workers, including nurses, make up 1 of many volunteer types that participate in NVOADS—for example, more than 20,000 healthcare workers are part of the American Red Cross who “bring relief to disaster victims, work in military hospitals, and collect lifesaving blood.”<sup>71</sup> At present, NVOAD members are coordinating with HHS, FEMA, and the CDC to assist in the response to COVID-19, and the American Red Cross is active in collecting plasma donations. However, these organizations are donor-funded and volunteer-driven, meaning that they may lack the financial or human resources needed to support a public health emergency response. Additionally, they often draw on retired nurses, who can contribute a wide range of skills to a response but might be at increased risk for infection during a pandemic such as the ongoing COVID-19 outbreak, which can cause more severe illness in older individuals.

Moving forward, to help build a strong voluntary nurse disaster workforce, “national nursing organizations [should] encourage their membership to volunteer with response teams organized by the government or private organizations such as the American Red Cross. Advance registration through established systems can help ensure that nurses and other professionals are fully prepared to respond during disasters.”<sup>9</sup> Other interventions, such as improving malpractice protections during disasters, improving the ease of license reactivation, and better training, could also greatly increase nurse capacity.

### Short-term Recommendations

- NVOADs should conduct a needs assessment of PPE and infection prevention and control measures for all volunteer nurses.
- NVOADs should establish pandemic staffing policies that protect nurses in high-risk categories.
- NVOADs should provide rapid testing for COVID-19 to all volunteer nurses.

### Long-term Recommendations

- Implement regular emergency preparedness and response training for all nurses involved in NVOADs.

## What is the role of professional nursing organizations in developing the nursing workforce for emergency preparedness and response?

Professional nursing organizations such as the ANA, the American Association of Nurses, and the American Organization for Nursing Leadership, and the many subspecialty organizations such as the Emergency Nurses Association, the Association of Public Health Nurses, and others, have long advocated for the protection of nurses during disasters and public health emergencies. In 2007, the ANA Quadrennial Policy conference addressed “Life, Death and Disaster” and included workshops on disaster nursing and public health emergency preparedness, yet few organizations acknowledged nor prepared for the reality of a catastrophic biological event such as COVID-19.<sup>40</sup> Going forward, these organizations, characterized by strong leadership and an unwavering devotion to advancing nursing practice, policy, and research, should unite around a collective mission to advance nursing emergency preparedness and response.

### Short-term Recommendation

- The National Academy of Medicine, along with the Robert Wood Johnson Foundation, in collaboration with nursing organizations, should convene a national workshop of interdisciplinary subject matter experts in 2020 to explore the lessons learned from the national nurse response to COVID-19 and to expand and illuminate the recommendations contained in this report.

## Conclusions

We must act now to prevent illness and death from the next infectious disease emergency. Developing a national nursing workforce response for pandemic and public health emergencies will improve quality of care, help contain the emergency, and protect the health of nurses and other providers, patients, families, and community members. Improved responsiveness will diminish health disparities and improve population-based health outcomes. In a crisis like the one we are experiencing with COVID-19, there are many lessons for nursing that need to be learned and urgently acted on.

## Outputs for an Optimally Prepared Nursing Workforce

- Clear and uniform academic standards
- Nurses who are educated, trained, and clinically competent
- Safe workplace environments
- Adequate access to PPE
- Regulatory consistency across states
- Nurses cross-trained for various clinical settings
- Regular, transparent communications

### Short-term Outcomes

- Knowledge (eg, knowledge of epidemiology of disease)
- Attitudes and beliefs (eg, perceived risks, self-efficacy, duty to care, trust, willingness to respond, etc)
- Skills (eg, PPE donning and doffing, ventilator management)
- Abilities (eg, screening, detection, disease containment, establish PODs)
- Increased nurse mobility and deployment
- Increased nurse knowledge and skills
- Increased nurse resilience
- Adequate staffing, team nursing

### Intermediate Outcomes

- Increased surge capacity in healthcare system
- Implementation of population-based triage
- Implementation of crisis standards of care
- Increased ICU/critical care capacity
- Equitable allocation of scarce resources
- Effective disease containment measures
- Increased resilience/physical and mental nurse stamina in public health emergencies
- Sustained, functional staffing

### Long-term Outcomes

- Improved population health outcomes
- Healthcare systems business continuity
- Workforce stability
- Enhanced preparedness for future pandemics



## References

1. Stone W, Feibel C. COVID-10 has killed close to 300 U.S. health care workers, new data from CDC shows. *NPR*. May 28, 2020. Accessed June 2, 2020. <https://www.npr.org/sections/health-shots/2020/05/28/863526524/covid-19-has-killed-close-to-300-u-s-health-care-workers-new-data-from-cdc-shows>
2. American Nurses Association. COVID-19 survey: March 20-April 10. Accessed May 21, 2020. <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/education/innovation/>
3. US Centers for Disease Control and Prevention. Cases in the US. Last reviewed June 8, 2020. Accessed June 9, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>
4. Ali SS. Why some nurses have quit during the coronavirus pandemic. *NBC News*. May 10, 2020. Accessed May 21, 2020. <https://www.nbcnews.com/news/us-news/why-some-nurses-have-quit-during-coronavirus-pandemic-n1201796>
5. Veenema TG, ed. *Disaster Nursing and Emergency Preparedness*. Springer Publishing Co; 2018.
6. American Association of Colleges of Nursing. Fact sheets. Accessed May 21, 2020. <https://www.aacnnursing.org/News-Information/Fact-Sheets/Nursing-Workforce>
7. Hick JL, Hanfling D, Wynia MK, Pavia AT. *Duty to Plan: Health Care, Crisis Standards of Care, and Coronavirus-SARS-CoV-2*. National Academy of Medicine. March 5, 2020. Accessed May 21, 2020. <https://nam.edu/duty-to-plan-health-care-crisis-standards-of-care-and-novel-coronavirus-sars-cov-2/>
8. Baack S, Alfred D. Nurses' preparedness and perceived competence in managing disasters. *J Nurs Scholarsh*. 2013;45(3):281-287. doi:10.1111/jnu.12029
9. Veenema TG, Griffin A, Gable AR, et al. Nurses as leaders in disaster preparedness and response—a call to action. *J Nurs Scholarsh*. 2016;48(2):187-200. doi:10.1111/jnu.12198
10. Usher K, Redman-MacLaren ML, Mills J, et al. Strengthening and preparing: enhancing nursing research for disaster management. *Nurse Educ Pract*. 2015;15(1):68-74. doi:10.1016/j.nepr.2014.03.006
11. Office of the Assistant Secretary for Preparedness and Response. Technical Resources, Assistance Center, and Information Exchange. Healthcare Emergency Preparedness Information Gateway. Emergency preparedness information modules for nurses in acute care settings. August 2019. Accessed May 21, 2020. <https://files.asprtracie.hhs.gov/documents/aspr-tracie-emergency-preparedness-information-modules-for-nurses-and-economic-framework.pdf>.
12. Charney RL, Lavin RP, Bender A, Langan JC, Zimmerman RS, Veenema TG. Ready to respond: a survey of interdisciplinary health-care students and administrators on disaster management competencies. *Disaster Med Public Health Prep*. Published online September 30, 2019.. doi:10.1017/dmp.2019.96
13. HHS Office of the Assistant Secretary for Preparedness and Response. Saving lives and protecting Americans from 21st century health security threats. Last reviewed November 18, 2019. Accessed on May 22, 2020. <https://www.phe.gov/about/aspr/Pages/default.aspx>
14. Office of the Assistant Secretary for Preparedness and Response. *2017-2022 Health Care Preparedness and Response Capabilities*. November 2016. Accessed May 22, 2020. <https://www.phe.gov/Preparedness/planning/hpp/reports/Documents/2017-2022-healthcare-pr-capabilities.pdf>
15. The White House. *National Biodefense Strategy*. 2018. Accessed June 2, 2020. <https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Biodefense-Strategy.pdf>
16. HHS Assistant Secretary for Preparedness and Response. Technical Resources, Assistance Center, and Information Exchange. Healthcare Emergency Preparedness Information Gateway. Novel coronavirus resources. Last updated June 9, 2020. Accessed June 9, 2020. <https://asprtracie.hhs.gov/COVID-19>
17. US Department of Health and Human Services. HHS provides an additional \$250 million to help US health care systems respond to COVID-19. News release. June 2, 2020. Accessed June 3, 2020. <https://www.hhs.gov/about/news/2020/06/02/hhs-provides-additional-250-million-help-us-health-care-systems-respond-covid-19.html>

18. Health Resources and Services Administration. Grants: Nursing. Last reviewed April 2020. Accessed May 21, 2020. <https://bhwh.hrsa.gov/grants/nursing>
19. US Department of Labor. Occupational Safety and Health Administration. About OSHA. Accessed May 22, 2020. <https://www.osha.gov/aboutosha>
20. US Department of Labor. Occupational Safety and Health Administration. *Training Requirements in OSHA Standards*. 2015. Accessed May 21, 2020. <https://www.osha.gov/Publications/osha2254.pdf>
21. US Department of Labor. Occupational Safety and Health Administration. Guidance on Preparing Workplaces for COVID-19. 2020. Accessed May 21, 2020. <https://www.osha.gov/Publications/OSHA3990.pdf>
22. US Department of Labor. Occupational Safety and Health Administration. OSH Act of 1970, General Duty Clause. Accessed May 21, 2020. <https://www.osha.gov/laws-regs/oshact/section5-duties>
23. Schwing E. How OSHA has failed to protect America's workers from COVID-19. *Government Executive*. April 7, 2020. Accessed June 2, 2020. <https://www.govexec.com/oversight/2020/04/how-osha-has-failed-protect-americas-workers-covid-19/164382/>
24. Veenema TG, Lavin RP, Schneider-Firestone S, et al. National assessment of nursing schools and nurse educators readiness for radiation emergencies and nuclear events. *Disaster Med Public Health Prep*. 2019;13(5-6):936-945. doi:10.1017/dmp.2019.17
25. Richmond A, Hostler L, Leeman G, King W. A brief history and overview of CDC's Centers for Public Health Preparedness Cooperative Agreement program. *Public Health Rep*. 2010;125(Suppl 5):8-14. doi:10.1177/00333549101250S503
26. Savoia E, Guicciardi S, Bernard DP, Harriman N, Leinhos M, Testa M. Preparedness Emergency Response Research Centers (PERRCs): addressing public health preparedness knowledge gaps using a public health systems perspective. *Am J Public Health*. 2018;108(S5):S363-S365. doi:10.2105/AJPH.2018.304812
27. Leinhos M, Qari SH, Williams-Johnson M. Preparedness and emergency response research centers: using a public health systems approach to improve all-hazards preparedness and response. *Public Health Rep*. 2014;129(Suppl 4):8-18. doi: 10.1177/00333549141296S403
28. Inglesby T, Sosin DM. *Preparedness and Emergency Response Research Centers (PERRC) Mid-Project Review: A Report from the Board of Scientific Counselors*. 2012. Accessed June 9, 2020. [https://www.cdc.gov/cpr/science/documents/ERPO\\_Review\\_PERRC\\_Program\\_Review\\_Workgroup\\_Report\\_Final2.pdf](https://www.cdc.gov/cpr/science/documents/ERPO_Review_PERRC_Program_Review_Workgroup_Report_Final2.pdf)
29. US Centers for Disease Control and Prevention. Grant funding profiles—summary view. Accessed April 29, 2020. <https://wwwn.cdc.gov/FundingProfilesApp/Category/Category>
30. National Institute of Nursing Research. Mission & strategic plan. Accessed April 29, 2020. <https://ninr.nih.gov/aboutninr/ninr-mission-and-strategic-plan#>
31. National Institutes of Health. NIH RePORTER. 2020. Accessed April 29, 2020. <https://projectreporter.nih.gov/reporter.cfm>
32. Duke to lead \$50 million study of COVID-19 prevention in health care workers. *Duke Today*. April 2, 2020. Accessed April 29, 2020. <https://today.duke.edu/2020/04/duke-lead-50-million-study-covid-19-prevention-health-care-workers>
33. Alkhenizan A, Shaw C. Impact of accreditation on the quality of health care services: a systematic review of the literature. *Ann Saudi Med*. 2011;31(4):407-416. doi: 10.4103/0256-4947.83204
34. Greenfield D, Pawsey M, Hinchcliff R, Moldovan M, Braithwaite J. The standard of health care accreditation standards: a review of empirical research underpinning their development and impact. *BMC Health Serv Res*. 2012;12:329. doi: 10.1186/1472-6963-12-329
35. Centers for Medicare & Medicaid Services. Medicare and Medicaid programs; Emergency preparedness requirements for Medicare and Medicaid participating providers and suppliers. Final rule. *Federal Register*. 2016;81(180). Accessed April 28, 2020. <https://www.federalregister.gov/documents/2016/09/16/2016-21404/medicare-and-medicare-programs-emergency-preparedness-requirements-for-medicare-and-medicare>.

36. Centers for Medicare & Medicaid Services. Emergency preparedness rule. Last modified November 5, 2019. Accessed April 28, 2020. <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertEmergPrep/Emergency-Prep-Rule>
37. Assistant Secretary for Preparedness and Response. Healthcare Emergency Preparedness Information Gateway. CMS and Disasters: Resources at Your Fingertips. Updated August 2019. Accessed April 28, 2020. <https://files.asprtracie.hhs.gov/documents/cms-ep-rule-resources-at-your-fingertips.pdf>
38. The Joint Commission. Health care staffing services. 2020. Accessed April 28, 2020. <https://www.jointcommission.org/measurement/asures/health-care-staffing-services/>
39. Langan JC, Lavin R, Wolgast KA, Veenema TG. Education for developing and sustaining a health care workforce for disaster readiness. *Nurs Adm Q*. 2017;41(2):118-127.
40. DeDonder J, Feldman J, Hamlin L. A report from ANA's 2007 Quadrennial Policy Conference Nursing Care in Life, Death, and Disaster. *Kans Nurse*. 2007;82(6):3-6.
41. Institute of Medicine; Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing. *The Future of Nursing: Leading Change, Advancing Health*. National Academies Press; 2011.
42. Spetz J. Projections of progress toward the 80% bachelor of science in nursing recommendation and strategies to accelerate change. *Nurs Outlook*. 2018;66(4):394-400. doi:10.1016/j.outlook.2018.04.012
43. National Academies of Sciences, Engineering, and Medicine. *Assessing Progress on the Institute of Medicine Report The Future of Nursing*. National Academies Press; 2016. Accessed May 21, 2020. <https://doi.org/10.17226/21838>
44. Littleton-Kearney MT, Slepski LA. Directions for disaster nursing education in the United States. *Crit Care Nurs Clin North Am*. 2008;20(1):103-109. doi:10.1016/j.ccell.2007.10.008
45. Veenema TG. Expanding educational opportunities in disaster response and emergency preparedness for nurses. *Nurs Educ Perspect*. 2006;27(2):93-99.
46. Weiner E, Irwin M, Trangenstein P, Gordon J. Emergency preparedness curriculum in nursing schools in the United States. *Nurs Educ Perspect*. 2005;26(6):334-339.
47. Walsh L, Subbarao I, Gebbie K, et al. Core competencies for disaster medicine and public health. *Disaster Med Public Health Prep*. 2012;6(1):44-52. doi:10.1001/dmp.2012.4
48. Schmidt CK, Davis JM, Sanders JL, Chapman LA, Cisco MC, Hady AR. Exploring nursing students' level of preparedness for disaster response. *Nurs Educ Perspect*. 2011;32(6):380-383. doi.org/10.5480/1536-5026-32.6.380
49. American Association of Colleges of Nursing. *The Essentials of Baccalaureate Education for Professional Nursing Practice*. 2008. Accessed May 21, 2020. <https://www.aacnnursing.org/Portals/42/Publications/BaccEssentials08.pdf>
50. American Association of Colleges of Nursing. *The Essentials of Master's Education in Nursing*. 2011. Accessed May 21, 2020. <https://www.aacnnursing.org/Portals/42/Publications/MastersEssentials11.pdf>
51. American Association of Colleges of Nursing. *The Essentials of Doctoral Education for Advanced Nursing Practice*. 2006. <https://www.aacnnursing.org/Portals/42/Publications/DNPEssentials.pdf>. Accessed May 21, 2020.
52. AAACEUs. Nursing continuing education requirements by state. Updated March 23, 2020. Accessed May 21, 2020. [https://www.aaaceus.com/state\\_nursing\\_requirements.asp](https://www.aaaceus.com/state_nursing_requirements.asp)
53. Auerbach DI, Buerhaus PI, Staiger DO. Implications of the rapid growth of the nurse practitioner workforce in the US. *Health Aff (Millwood)*. 2020;39(2):273-279. doi: 10.1377/hlthaff.2019.00686
54. Kamimura A, Schneider K, Lee CS, Crawford SD, Friese CR. Practice environments of nurses in ambulatory oncology settings: a thematic analysis. *Cancer Nurs*. 2012;35(1):E1-E7. doi:10.1097/NCC.0b013e31820b6efa
55. Trust for America's Health. *The Impact of Chronic Underfunding of America's Public Health System: Trends, Risks, and Recommendations, 2019*. Accessed May 21, 2020. [https://www.tfah.org/wp-content/uploads/2020/03/TFAH\\_2019\\_PublicHealthFunding\\_07.pdf](https://www.tfah.org/wp-content/uploads/2020/03/TFAH_2019_PublicHealthFunding_07.pdf)

56. Edmonds JK, Kneipp SM, Campbell L. A call to action for public health nurses during the COVID-19 pandemic. *Public Health Nurs.* 2020;37(3):323-324. doi: 10.1111/phn.12733
57. Cimiotti JP, Aiken LH, Sloane DM, Wu ES. Nurse staffing, burnout, and health care-associated infection *Am J Infect Control.* 2012;40(6):486-490. Published correction appears in *Am J Infect Control.* 2012;40(7):680. doi:10.1016/j.ajic.2012.02.029
58. Daud-Gallotti RM, Costa SF, Guimarães T, et al. Nursing workload as a risk factor for healthcare associated infections in ICU: a prospective study. *PLoS One.* 2012;7(12):e52342. doi:10.1371/journal.pone.0052342
59. Stone PW, Clarke SP, Cimiotti J, Correa-de-Araujo R. Nurses' working conditions: implications for infectious disease. *Emerg Infect Dis.* 2004;10(11):1984-1989. doi:10.3201/eid1011.040253
60. Mitchell BG, Gardner A, Stone PW, Hall L, Pogorzelska-Maziarz M. Hospital staffing and health care-associated infections: a systematic review of the literature. *Jt Comm J Qual Patient Saf.* 2018;44(10):613-622. doi:10.1016/j.jcjq.2018.02.002
61. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA.* Published online April 7, 2020. doi:10.1001/jama.2020.5893
62. Cornell Law School. Legal Information Institute. Electronic Code of Federal Regulations. 46 CFR § 15.1105. Familiarization and basic training (BT). Accessed May 21, 2020. <https://www.law.cornell.edu/cfr/text/46/15.1105>
63. Connor SB. When and why health care personnel respond to a disaster: the state of the science. *Prehosp Disaster Med.* 2014;29(3):270-274. doi:10.1017/S1049023X14000387
64. Henriksen Hellyer JM, DeVries AS, Jenkins SM, et al. Attitudes toward and uptake of H1N1 vaccine among health care workers during the 2009 H1N1 pandemic. *PLoS One.* 2011;6(12):e29478. doi:10.1371/journal.pone.0029478
65. National Nurses United. NNU COVID-19 survey results. March 16, 2020. Accessed May 21, 2020. [https://act.nationalnursesunited.org/page/-/files/graphics/0320\\_NNU\\_COVID-19\\_SurveyResults\\_Updated\\_031920.pdf](https://act.nationalnursesunited.org/page/-/files/graphics/0320_NNU_COVID-19_SurveyResults_Updated_031920.pdf)
66. Rajakaruna SJ, Liu WB, Ding YB, Cao GW. Strategy and technology to prevent hospital-acquired infections: lessons from SARS, Ebola, and MERS in Asia and West Africa. *Mil Med Res.* 2017;4(1):32. doi:10.1186/s40779-017-0142-5
67. Skryabina E, Reedy G, Amlôt R, Jaye P, Riley P. What is the value of health emergency preparedness exercises? A scoping review study. *Int J Disaster Risk Reduct.* 2017;21:274-283. doi: 10.1016/j.ijdrr.2016.12.010
68. Guyton J, Buccina J, Chengappa R, Cavitt S, Harjivan C. The Impact of State and Local Budget Cuts on Public Health Preparedness. Institute of Medicine. June 13, 2011. Accessed May 21, 2020. <https://www.nap.edu/resource/21809/Impact-of-state-and-local-budget-cuts-on-PHP.pdf>
69. Veenema TG, Deruggiero K, Losinski S, Barnett D. Hospital administration and nursing leadership in disasters: an exploratory study using concept mapping. *Nurs Adm Q.* 2017;41(2):151-163. doi:10.1097/NAQ.0000000000000224
70. National Voluntary Organizations Active in Disaster. About us. Accessed June 2, 2020. <https://www.nvoad.org/about-us/>
71. American Red Cross. Nursing & health. Accessed June 2, 2020. <https://www.redcross.org/about-us/who-we-are/nursing-health.html>

## **Acronyms and Abbreviations**

AACN = American Association of Colleges Nursing

AAN = American Academy of Nursing

AHRQ = Agency for Health Care Research Quality

APRN = Advanced Practice Registered Nurse

ANA = American Nurses Association

ASPR = Assistant Secretary for Preparedness and Response

BSN = bachelor of science in nursing

CCNE = Commission on Collegiate Nursing Education

CDC = Centers for Disease Control and Prevention

CMS = Centers for Medicare and Medicaid Services

CPHP= Centers for Public Health Preparedness

DNP = doctorate of nursing practice

FEMA = Federal Emergency Management Agency

HHS = Department of Health and Human Services

HPP = Hospital Preparedness Program

HRSA = Health Resources and Services Administration

ICUs = intensive care units

IOM = Institute of Medicine

MRC = Medical Reserve Corps

MSN = master of science in nursing

NDMS = National Disaster Medical System

NIH = National Institutes of Health

NINR = National Institute of Nursing Research

NVOAD = National Voluntary Organizations Active in Disasters

OSHA = Occupational Safety and Health Administration

PCORI = Patient-Centered Outcomes Research Institute

PHERRC = Public Health Emergency Response Research Centers

PODs = points of distribution

PPE = personal protective equipment

SARS = severe acute respiratory syndrome

SNS = Strategic National Stockpile

TRACIE = Technical Resources, Assistance Center, and Information Exchange



**Johns Hopkins  
Center for Health Security**

621 E. Pratt Street, Suite 210  
Baltimore, MD 21202

Tel: 443-573-3304

Fax: 443-573-3305

[centerhealthsecurity@jhu.edu](mailto:centerhealthsecurity@jhu.edu)  
[centerforhealthsecurity.org](http://centerforhealthsecurity.org)



**JOHNS HOPKINS**  
BLOOMBERG SCHOOL  
of PUBLIC HEALTH

**Center for  
Health Security**