

# Critical Care Staffing in Pandemics and Disasters



## A Consensus Report From a Subcommittee of the Task Force for Mass Critical Care – Systems Strategies to Sustain the Health Care Workforce

Charles L. Sprung, MD, FCCP; Asha V. Devereaux, MD, MPH, FCCP; Marya Ghazipura, PhD; Lisa D. Burry, BScPharm, PharmD, FCCP; Tanzib Hossain, MD; Mitchell T. Hamele, MD; Ramon E. Gist, MD; Timothy M. Dempsey, MD, MPH, FCCP; Jeffrey R. Dichter, MD, FCCP; Kiersten N. Henry, DNP; Alexander S. Niven, MD, FCCP; Timur Alptunaer, MD, FACEP; Meredith Huffines, MS, BA, RN; Kasey R. Bowden, MSN, FNP, AGANP; Anne Marie O. Martland, MSN, ACNP-BC; Jamie R. Felzer, MD, MPH; Steven H. Mitchell, MD; Pritish K. Tosh, MD; Jason Persoff, MD; Vikramjit Mukherjee, MD, MBBS; James Downar, MDCM, MHSc; Amado A. Báez, MD, MPH, PhD, FCCP; and Ryan C. Maves, MD, FCCP; for the Task Force for Mass Critical Care Writing Group\*

**BACKGROUND:** The COVID-19 pandemic has led to unprecedented mental health disturbances, burnout, and moral distress among health care workers, affecting their ability to care for themselves and their patients.

**RESEARCH QUESTION:** In health care workers, what are key systemic factors and interventions impacting mental health and burnout?

**STUDY DESIGN AND METHODS:** The Workforce Sustainment subcommittee of the Task Force for Mass Critical Care (TFMCC) utilized a consensus development process, incorporating evidence from literature review with expert opinion through a modified Delphi approach to determine factors affecting mental health, burnout, and moral distress in health care workers, to propose necessary actions to help prevent these issues and enhance workforce resilience, sustainment, and retention.

**RESULTS:** Consolidation of evidence gathered from literature review and expert opinion resulted in 197 total statements that were synthesized into 14 major suggestions. These suggestions were organized into three categories: (1) mental health and well-being for staff in medical settings; (2) system-level support and leadership; and (3) research priorities and gaps. Suggestions include both general and specific occupational interventions to support health care worker basic physical needs, lower psychological distress, reduce moral distress and burnout, and foster mental health and resilience.

**INTERPRETATION:** The Workforce Sustainment subcommittee of the TFMCC offers evidence-informed operational strategies to assist health care workers and hospitals plan, prevent, and treat the factors affecting health care worker mental health, burnout, and moral distress to improve resilience and retention following the COVID-19 pandemic.

CHEST 2023; 164(1):124-136

**KEY WORDS:** burnout; critical care; disasters; health-care workforce; mental health; moral distress; pandemics; resilience; staffing

**ABBREVIATIONS:** HCW = health care worker; PPE = personal protective equipment; TFMCC = Task Force for Mass Critical Care

**AFFILIATIONS:** From the Hadassah Medical Organization and Faculty of Medicine (C. L. S.), Hebrew University of Jerusalem, Jerusalem,

Israel; Sharp Coronado Hospital (A. V. D.), Coronado, CA; ZS Associates (M. G.), New York, NY; University of Toronto (L. D. B.), Toronto, ON, Canada; New York University (T. H. and V. M.), Grossman School of Medicine, New York, NY; Tripler Army Medical

The COVID-19 pandemic has changed many aspects of health care around the world. As of February 10, 2023, more than 677 million COVID-19 cases and 6.8 million deaths have been reported globally.<sup>1</sup> The World Health Organization estimates 115,500 health care workers (HCWs) died of COVID-19 between January 2020 and May 2021.<sup>2</sup> The pandemic has escalated the stress experienced by HCWs around the world, with increased reports of mental health disturbances,<sup>3-10</sup> burnout,<sup>6,11</sup> and moral distress.<sup>12,13</sup> HCWs suffer from increased anxiety (12%-89%),<sup>8,9</sup> depression (16%-82%),<sup>4,9</sup> stress reactions (5%-80%),<sup>7,8</sup> sleep disturbances (8%-96%),<sup>3,9</sup> and posttraumatic stress disorder (7%-73%).<sup>7,8</sup>

Prolonged exposure to high-intensity workplace stressors place HCWs at great risk for burnout. While signs of burnout can overlap with other conditions, such as depression, it typically involves exhaustion, alienation, and decreased performance.<sup>14</sup> During the COVID-19 pandemic, HCWs reported high levels of burnout (3%-69%),<sup>6,8</sup> emotional exhaustion (3%-50%),<sup>5,10</sup> reduced personal accomplishment

(1%-25%),<sup>10</sup> depersonalization (13%-21%),<sup>10</sup> and risk of suicide.<sup>15</sup> This has led to a crisis in HCW staffing.<sup>16</sup> Several factors are associated with this increased burnout. These include direct contact with infected patients,<sup>17</sup> fear of infection or transmission of infection,<sup>12,18</sup> lack of key supplies (eg, ventilators, personal protective equipment [PPE]),<sup>18,19</sup> inadequate beds for patient care,<sup>18,19</sup> triage of patients and ethical and end-of-life decisions,<sup>12,18,19</sup> insufficient information and communication,<sup>18,19</sup> high work demands with low work control,<sup>20</sup> perceived inadequate training,<sup>17</sup> inadequate rest,<sup>21</sup> inability to care for one's family,<sup>12</sup> and visitation limitations.<sup>12,22</sup>

By pushing health systems and workers to the breaking point, the pandemic revealed how overburdened these systems and the HCWs functioning within them already were. As a result, the US Department of Health and Human Services (HHS) announced in July 2021 that \$103 million US dollars from the American Rescue Plan would be allocated to address burnout and strengthen resiliency in the health care workforce.<sup>23</sup> In March 2022, Congress passed the Dr Lorna Breen Health Care Provider Protection Act, directing HHS to fund hospitals, professional associations, and other groups to identify strategies for the promotion of mental health and resiliency among HCWs and to disseminate best practices.<sup>24</sup> In May 2022, the US Surgeon General issued an advisory report describing HCW burnout and moral distress as threats not only to the workforce but to the public health of the country, one that requires "systems-oriented, organizational-level solutions" that go beyond simple calls for individual resiliency.<sup>25</sup>

The Task Force for Mass Critical Care (TFMCC), composed of a multidisciplinary group of disaster medicine professionals experienced in the management of critically ill patients, has previously developed consensus statement suggestions for the provision of care during disasters and pandemics<sup>26</sup> and recently the implementation of contingency strategies for mass critical care surge responses during COVID-19.<sup>27</sup> Given the importance of HCW mental health, resilience, moral distress, and burnout risk on the long-term impact on health care delivery, the TFMCC convened a Workforce Sustainment subcommittee to address these issues. The committee is composed of: physicians and advanced practice provider specialists in critical care, infectious disease, pediatrics, emergency medicine, and hospital medicine; nursing specialists; and pharmacy and methodology experts. The aim of the group was to

---

Center (M. T. H.), Honolulu, HI; Uniformed Services University (M. T. H. and T. A.), Bethesda, MD; SUNY Downstate Health Science University (R. E. G.), Brooklyn, NY; David Grant Medical Center (T. M. D.), US Air Force, Travis AFB, CA; University of Minnesota (J. R. D.), Minneapolis, MN; MedStar Montgomery Medical Center (K. N. H.), Olney, MD; Mayo Clinic (A. S. N., J. R. F., and P. K. T.), Rochester, MN; Leonard J. Chabert Medical Center (T. A.), Houma, LA; University of Maryland (M. H.), Baltimore, MD; University of Colorado School of Medicine (K. R. B. and J. P.), Aurora, CO; Scripps Health (A. M. O. M.), San Diego, CA; University of Washington (S. H. M.), Seattle, WA; University of Ottawa (J. D.), Ottawa, ON, Canada; Medical College of Georgia (A. A. B.), Augusta, GA; and Wake Forest University School of Medicine (R. C. M.), Winston-Salem, NC.

\*Collaborators from the Task Force for Mass Critical Care Writing Group are listed in the Acknowledgments.

**DISCLAIMER:** Mitchell T. Hamele, Timothy M. Dempsey, and Timur Alptunaer are US Government employees or military service members. This work was prepared as part of their official duties. Title 17 U.S.C. §105 provides that "Copyright protection under this title is not available for any work of the United States Government." Title 17 U.S.C. §101 defines a US Government work as a work prepared by a military service member or employee of the US Government as part of that person's official duties. The opinions and assertions contained herein are those of the authors and do not reflect the official views or position of the United States Department of the Navy, Department of the Army, Department of Defense, Department of Veterans Affairs, the US Government, nor of the academic institutions with which the authors are affiliated. American College of Chest Physician guidelines are intended for general information only, are not medical advice, and do not replace professional medical care and physician advice, which always should be sought for any medical condition. The complete disclaimer for this guideline can be accessed at <https://www.chestnet.org/Guidelines-and-Resources>.

**CORRESPONDENCE TO:** Charles L. Sprung, MD, FCCP; email: [charless@ekmd.huji.ac.il](mailto:charless@ekmd.huji.ac.il)

Copyright © 2023 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.

DOI: <https://doi.org/10.1016/j.chest.2023.03.008>

combine the TFMCC members' expertise in real-time during the pandemic with evidence from the literature to

propose actionable guidance to improve health care workforce sustainment.

## Study Design and Methods

Adopting and merging methodological frameworks from the World Health Organization<sup>28</sup> and the Guidelines International Network-McMaster Guideline Development Checklist<sup>29</sup> for rapid guidelines, the TFMCC established a consensus development process to develop relevant suggestions that integrate evidence synthesized from the literature and high-caliber expert opinion. This process (described in detail in the TFMCC preliminary recommendations<sup>27</sup> and in e-Appendix 1 of this article) uses a three-round modified Delphi approach, with the first round focusing on synthesizing published evidence, the second on anecdotal evidence, and the final on developing suggestions. A five-point Likert scale, derived from the Grading of Recommendations, Assessment, Development, and Evaluations grid<sup>30</sup> was used at each round, where statements and suggestions were included if they met the retention criteria (mean

Likert score of  $\geq 3.5$  points of 5 points with at least 80% of members voting). Elements of the GRADE Evidence to Decision framework were adopted and applied to guide voting, factoring in priority of problems, quality of evidence, balance of values and preferences and desirable and undesirable effects, resource requirements, cost-effectiveness, and feasibility of implementation related to staffing and resilience.<sup>31</sup>

Twenty-two experts in disaster and pandemic care were selected from TFMCC membership to form an expert panel, of whom 17 were physicians, two were nurses, two were advanced practice nurses, and one was a pharmacist. Panelists participated in a modified Delphi process through video conference calls held every 2 weeks, with further discussion and voting conducted via e-mail (Fig 1). All 22 members participated in literature review, data extraction, generation of statements and suggestions, and voting.

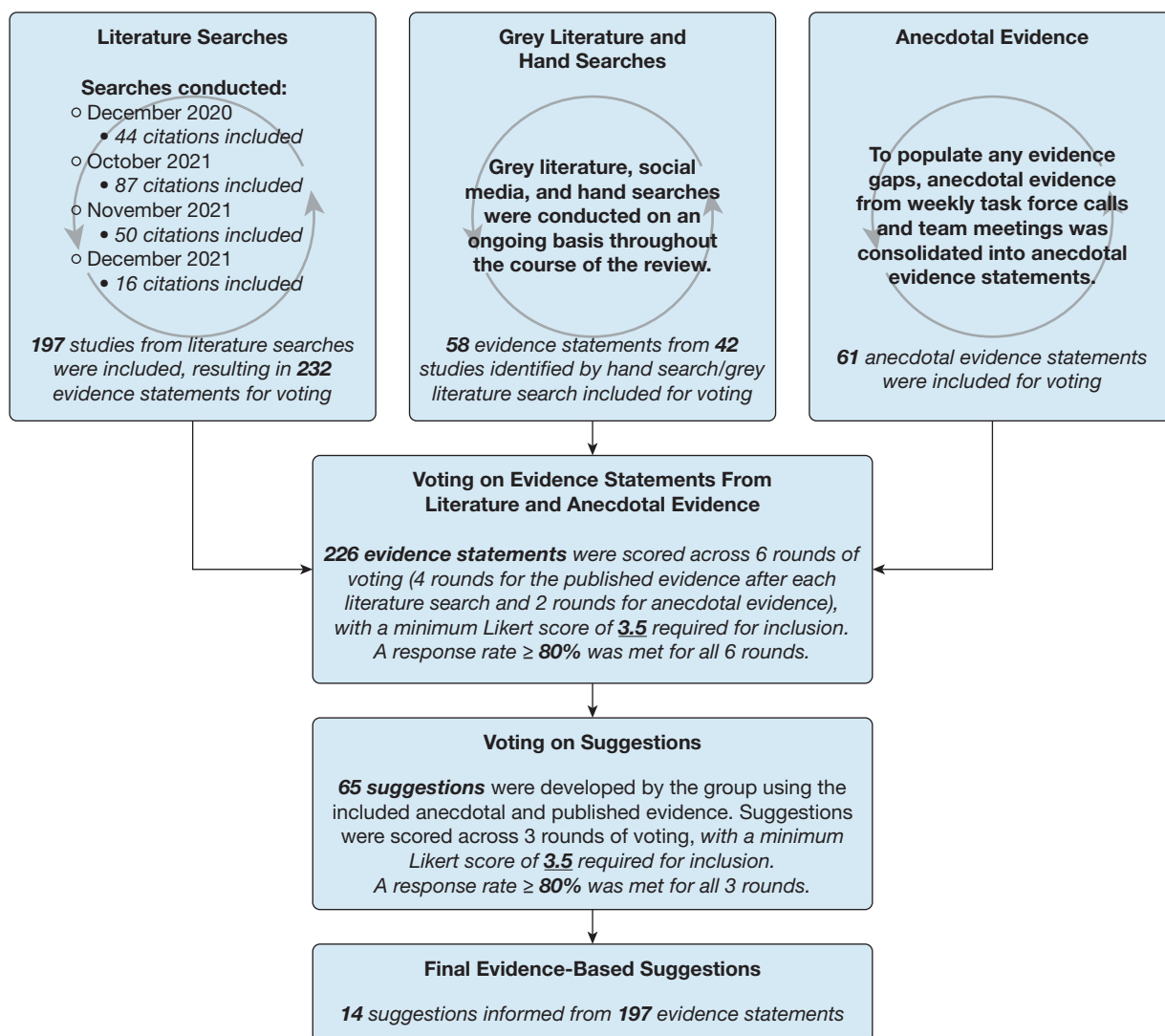


Figure 1 – Description of process to develop the final evidence-based suggestions.

## Results

An initial literature search in December 2020 resulted in 44 relevant articles. The initial search was updated in December 2021 with 153 more articles added. Six additional publications were identified from article references, news articles, and panelist input. Ultimately, 152 statements were extracted from the published evidence by the panel. An additional 45 anecdotal statements were collected based solely on the diverse clinical personal experiences of members of the TFMCC involved in the direct care of hospitalized patients with COVID-19. The statements abstracted from the publications combined with the anecdotal statements served as the basis of proposed suggestions. The overall quality of evidence was low because included articles were primarily observational and anecdotal statements were based on expert opinion.

After a thorough review to consolidate statements and reduce redundancy, 65 potential suggestions were identified that met retention criteria. These suggestions were organized into three major categories: (1) mental health and well-being for staff in medical settings; (2) system-level support and leadership (with two subcategories: [a] staffing and training and [b] policy); and (3) research priorities and gaps. These suggestions were further consolidated, and after final voting, 14 major suggestions meeting retention criteria remained. The final list of suggestions approved by consensus of all panel members is presented in [Table 1](#). Suggestions include both general and specific occupational interventions to address HCW basic physical needs, psychological distress (which negatively affects overall well-being, clinical decision-making, and job retention), and moral distress and burnout, and to foster and improve mental health and resilience. Published and anecdotal evidence with the resultant suggestions are detailed in [e-Table 1](#). The Workforce Sustainment subcommittee also suggested sample staff retention implementation planning steps ([Fig 2](#)) and minimal, essential suggestions that every institution should implement or work toward implementing for health care workforce sustainment ([Fig 3](#)). [e-Figure 1](#) includes suggestions along with proposed initiatives for health care workforce sustainment.

Although most of the suggestions were highly rated, some key suggestions deserve mention that were consistently repeated in the literature:

**Excess staff workloads and long hours lead to distress** (Suggestions 1, 2, 6, 7, 9, 10, and 14): The risk of HCW distress and burnout are decreased with flexible work

hours, balance of work between higher and lower stress environments, limited shift duration and amount of overtime, ensuring sufficient rest periods between shifts, and limited nonessential responsibilities (eg, documentation). Future research should study surge staffing models, principles, and clinical outcomes in a systematic manner.

**Emotional health support for HCWs** (Suggestions 2, 3, 4, 5, 7, 8, 13, and 14): It is imperative that health care leadership recognize the importance of emotional health support for HCWs and provide resources readily available in the workplace. Resources should be voluntary and include mental health professionals available for drop-in sessions and virtual electronic sessions, and leadership should find ways to embed mental health professionals into health care teams. Positioning mental health professionals within health care environments facilitates acceptance as peers and enhances patient care activities, including stressful event debriefs, navigating difficult ethical situations, and handling patient or peer deaths. Although especially important during demanding events such as a pandemic, routinely incorporating mental health professionals into demanding critical care environments helps destigmatize and normalize mental health support and provides coping strategies and opportunities for recovery.

**Empowerment of the health care workforce** (Suggestions 2, 6, 11, 12, and 14): Health care leadership must promote the empowerment and autonomy of HCWs in decision-making across the breadth of their organizations. During times of severe duress, such as a pandemic, HCWs' essential contributions include expertise for optimizing the use of medications and PPE during periods of shortage; establishing safe visitation policies; implementation of surge staffing models; surge planning, including critical clinical prioritization of equipment and supplies; and developing best processes for triage of scarce resources during crisis standards of care. Clinician leaders should be empowered to determine ICU surge levels, especially in contingency and crisis periods, as bedside clinicians possess current information, knowledge of resources, and capacity for real-time problem-solving for unexpected issues during surges.<sup>27</sup> Empowerment and autonomy in decision-making have been identified as factors in improved job satisfaction.<sup>32</sup>

## Discussion

The pandemic has shed a spotlight on the consequences of moral distress and burnout on mental

TABLE 1 ] Suggestions for Health Care Workforce Sustainment

<b>Mental Health and Well-being for Staff in Medical Settings</b>	
<b><i>Stress Factors, Posttraumatic Stress Disorder, and Burnout</i></b>	
1	To address health care worker psychological distress (which negatively affects overall well-being, clinical decision-making, and job retention), we suggest that occupational interventions focus on: (a) balancing heavy workloads (through flexible work hours or rotating between high- and low-stress environments); (b) providing adequate training and supplies for patient care (such as PPE for staff safety, medications, beds, and other equipment); (c) maintaining appropriate staffing ratios; and (d) building trust in leadership through clear and consistent communication and support.
2	We suggest that organizations prioritize the well-being of all staff (including nonclinical staff) with attention to adequate nutrition, hydration, rest breaks during the workday, collaboration and socialization with colleagues, exercise, sleep management, family support, and support for professional psychological services. This is especially important during staffing shortages or overwhelming demands, during which time health care workers often sacrifice self-care, leading to increased fatigue and impaired coping, immunity, and cognitive function. Therefore, we suggest that health systems ensure: (a) compliance with mandated rest periods; (b) adequate respite between day and night shifts; (c) strict adherence to the 12-h shift, including sign-out times; (d) opportunities for staff physical fitness; (e) mental health breaks and/or debriefs following stressful events (such as workplace assault and peer illness or demise); and (f) development of models for health care worker engagement.
3	We suggest that interventions addressing health care worker mental health include easily available resources regarding psychological distress, be voluntary, free of stigma (both from others and oneself), utilize peers, and be both supported and modeled by senior leadership. Furthermore, we suggest that during emergencies, mental health resources be made more accessible by stationing services near the workplace to allow drop-in sessions, embedding mental health professionals directly within health care teams, and/or providing virtual mental health services.
4	We suggest that health care worker support be available to all but target populations at high risk of burnout, moral injury, and posttraumatic stress disorder for early assessment and intervention. These groups include: (a) less-experienced workers/staff in-training; (b) those with direct contact with affected patients (particularly ED and ICU bedside nurses); (c) health care workers involuntarily deployed to work; (d) those without strong social support at home; and (e) those with significant family and childcare needs. We suggest that health care worker supervisors identify and monitor these factors.
5	To reduce the burden of global health care worker burnout rates, we suggest that organizations and supervisors: (a) provide early identification of individuals exhibiting signs of depression, anxiety, and stress reactions; (b) address sources of moral distress or injury; (c) provide support, protection, and respect for health care workers experiencing burnout; and (d) promote joy and safety in clinical work. We suggest that the above can be achieved through regular check-ins, debriefing sessions, peer support networks, and formal mentorship programs, as well as through inclusion of front-line health care workers in organizational decision-making and involvement of administrative leaders on the front lines.
<b>System-Level Support and Leadership</b>	
<b><i>Staffing and Training</i></b>	
6	As health care worker stress is compounded by high work demands with limited work control, to improve resiliency, we suggest implementation of methods to: (a) decrease workload (ie, eliminating nonessential tasks, redundant or excessive documentation, and not mandating overtime); (b) increase staffing (via flexible staff scheduling or the use of nonclinical staff to assist in clinical roles); (c) promote autonomy and empowerment at the bedside and institutionally by increasing health care worker input into decision-making (decentralizing the process and bringing it to the bedside); and (d) include broad representation of affected personnel in executive leadership.
7	To foster staff resilience, we suggest that health care organizations and workplace leaders: (a) establish a positive and supportive work atmosphere that avoids isolation and promotes a sense of community; (b) humanize health care workers and acknowledge their vulnerabilities; (c) increase health care worker sense of professional achievement; (d) destigmatize the need for mental health support;

(Continued)

TABLE 1 ] (Continued)

	<ul style="list-style-type: none"> <li>(e) develop programs for family support;</li> <li>(f) incorporate paid training into employee schedules (instead of add-on to normal shifts or days off);</li> <li>(g) provide coping strategies and opportunities for recovery from negative experiences, including patient and colleague deaths; and</li> <li>(h) explore staffing models utilizing nonclinical staff to decrease workload burden for clinical staff, in particular nurses.</li> </ul>
8	<p>The availability of trained health care staff has proven to be a limiting factor in the provision of mass critical care, notably during public health emergencies. Therefore, we suggest:</p> <ul style="list-style-type: none"> <li>(a) state support for loan repayment programs;</li> <li>(b) educational support to expand training of the next generation of health care workers; and</li> <li>(c) health system leadership ensure pay equity between temporary/traveling and permanent staff when hiring health care workers.</li> </ul>
<b>Policy</b>	
9	<p>To address health care workers' and managers' distress and burnout, we suggest that interventions include federal, state, and local government; hospital systems; and communities to ensure cohesive, sustainable, and resourced solutions, including:</p> <ul style="list-style-type: none"> <li>(a) establishing safe staffing levels/ratios with input from appropriate clinical specialty expert societies with local implementation;</li> <li>(b) funding toward interventions that increase health care worker safety;</li> <li>(c) loan repayment programs;</li> <li>(d) onsite childcare programs; and</li> <li>(e) investments in health care worker education.</li> </ul>
10	<p>For patient and health care worker safety, we suggest that state and national regulations address staff overtime with appropriate regulatory oversight and review entities, such as the Joint Commission. We further suggest overtime be limited to no more than 25% above full time (1.25 FTE) except for short periods (days) during an acute event, and when staff overtime approaches these limits, especially during prolonged emergencies, alternate staffing models (such as utilizing non-ICU trained staff for specific tasks such as turning patients, vital signs measurement, and documentation) should be employed.</p>
11	<p>To foster staff resilience, we suggest that health care organizations establish effective vertical and horizontal lines of communication with leadership to:</p> <ul style="list-style-type: none"> <li>(a) keep staff informed of organizational actions with incorporation of staff feedback into processes related to shortages;</li> <li>(b) include staff input in emergency response planning for staffing, bed space, and supply shortages;</li> <li>(c) solicit solutions and feedback from clinicians for decisions regarding life-support devices and therapies during shortages; and</li> <li>(d) develop debriefing and peer-support systems to address mental health concerns.</li> </ul>
12	<p>We suggest that all health care institutions establish policies to mitigate moral distress due to mass care of the critically ill and potential crisis standards of care, including:</p> <ul style="list-style-type: none"> <li>(a) dissemination of information about infection control strategies, including training and personal protective equipment availability and usage;</li> <li>(b) communicating reasons for and exceptions to restricted visitation policies;</li> <li>(c) offering information and transparency on end-of-life decision-making in times of excessive strain;</li> <li>(d) focusing on task-oriented actions, planning, and problem-solving rather than emotion-oriented solutions;</li> <li>(e) triage and fair allocation of resources decision-making should be made by a dedicated triage team composed of experienced clinical staff who are removed away from the bedside care and work in collaboration with administration and regional response<sup>3</sup>; and</li> <li>(f) tele-work and tele-health work options, especially for vulnerable staff members.</li> </ul>
<b>Research Priorities and Gaps</b>	
13	<p>As the evidence in the literature regarding the mental health of health care workers during pandemics is in its infancy, we suggest that:</p> <ul style="list-style-type: none"> <li>(a) epidemiologic research is needed to better define and compare the prevalence of mental health disorders, moral distress, and burnout among health care workers before, during, and after a pandemic or mass disaster;</li> <li>(b) multidisciplinary research is needed to evaluate the effectiveness of interventions to identify, prevent, and mitigate mental health disorders and promote resiliency; and</li> <li>(c) additional research is needed to determine the factors acting as barriers and facilitators to implementation of interventions to address mental health in health care workers.</li> </ul>
14	<p>We suggest that specific studies investigate:</p> <ul style="list-style-type: none"> <li>(a) the impact of basic physiologic needs (safety, rest, nutrition, hydration, exercise, housing, and family support) on the performance of teams in prolonged crisis, as well as contribution to moral distress and other mental health conditions;</li> </ul>

(Continued)

**TABLE 1 ] (Continued)**

- (b) the impact of communication, messaging, and rapid response to feedback on moral distress and other mental health conditions; and
- (c) the impact of easily accessible psychosocial and mental health support options, including tele-health or application-based interventions, on moral distress and other mental health conditions in time of extended crisis.

FTE = full-time equivalent; PPE = personal protective equipment.

<sup>a</sup>In some countries or areas in which the administration has no medical expertise and there may be no regional response, determination may have to be provided by bedside clinicians, which may contribute to moral distress.

health of HCWs and highlighted the moral and ethical imperatives to address them in health care. Burnout starts during training and affects approximately one-half of our colleagues, placing them at higher risk for broken relationships, alcohol misuse, substance misuse, and suicide. The pandemic has only intensified this problem among bedside ICU staff, threatening the viability of critical care delivery in the United States and around the world. As a group with critical care expertise and direct experience managing patients, staff, and hospital systems through the pandemic, we consolidated critical lessons from our combined experiences with up-to-date evidence from reviews of the literature to develop 14 comprehensive suggestions providing actionable guidelines for health care systems to sustain the health care workforce for the future.

Critical care is mentally strenuous in normal times and more so during an acute or prolonged disaster. In 2016, the Critical Care Societies Collaborative (including the American College of Chest Physicians, American Thoracic Society, American Association of Critical Care Nurses, and the Society of Critical Care Medicine) joint report described the impact of burnout on critical care professionals prior to the pandemic. At that time, 25% to 33% of nurses and 45% of physicians reported symptoms of severe burnout.<sup>33</sup> The relentless, often grueling work of the pandemic has worsened these figures, which have risen by 10% from pre-pandemic levels.<sup>6,34</sup>

A well-functioning health system requires staff whose mental health and well-being are supported by their institutions. In this guide, we provide five suggestions

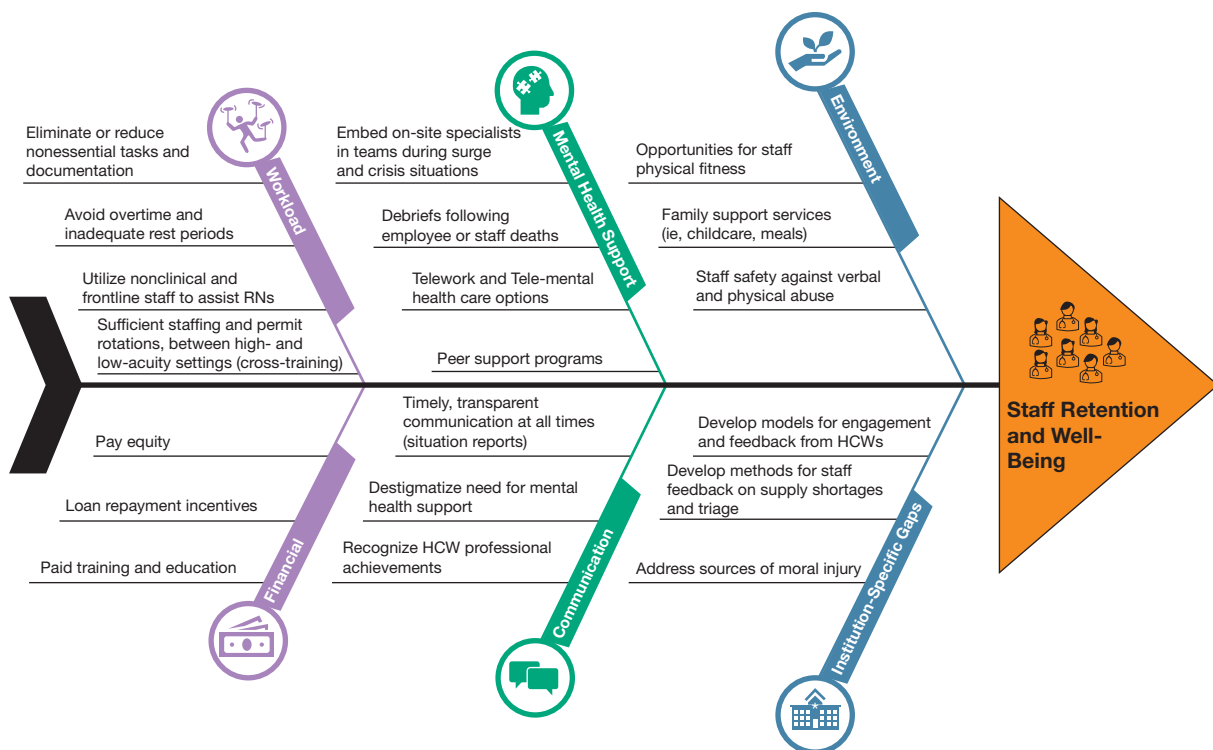


Figure 2 – Sample staff retention implementation planning steps. HCW = health care worker; RN = registered nurse.

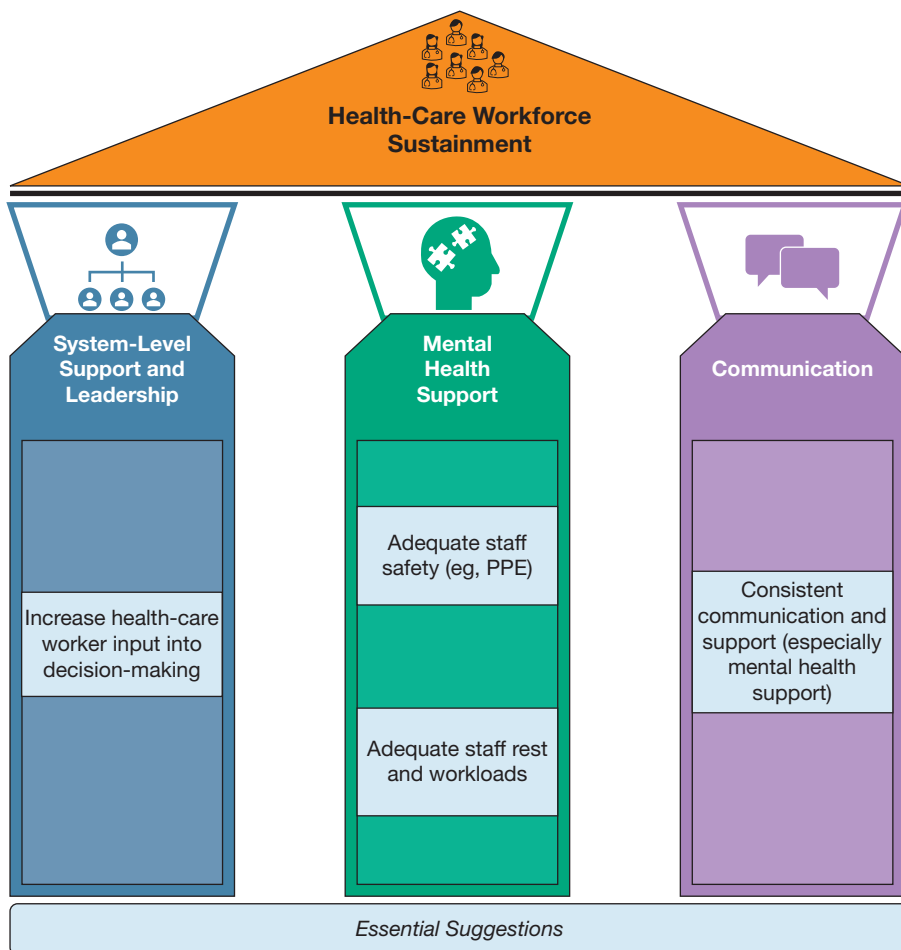


Figure 3 – Minimal, essential suggestions that every institution should implement or work toward implementing for health care workforce sustainment. PPE = personal protective equipment.

focusing on the mental health and well-being of staff in medical settings (Table 1, suggestions 1-5). Psychological distress among HCWs degrades the meaning of our daily work, the effectiveness of our interprofessional teams, and the quality of care that patients receive. Errors by bedside staff are more frequent as burnout becomes more prevalent.<sup>35</sup> In addition, we have experienced the departure of a large number of seasoned colleagues, particularly critical care nurses and respiratory therapists, from ICUs to other departments in the hospital with less stress, to early retirement, or to other professions.

Health care teams may rally around a short-term emergency, working long hours through an acute crisis with a finite period of recovery, but a prolonged pandemic leads to increased stress and depression.<sup>12</sup> Extended crises, lasting more than days to weeks, can lead to secondary trauma, reported in up to 40% of HCWs, with resultant high rates of anxiety disorders, depression, substance misuse, and suicide.<sup>36-38</sup> These risks are particularly pronounced among

less-experienced and nonclinical HCWs, such as unit administrative personnel, who have greater risk for adverse psychological events and chronic stress than experienced bedside staff.<sup>32,39,40</sup> Our professional culture must prioritize the mental wellness of clinical and nonclinical staff as an everyday practice, including open communication, ethical resolution processes, debriefings, celebrations of successes, and support for wellness in general.<sup>41-43</sup> These steps are essential for removing the stigma of seeking mental health support.<sup>17</sup>

HCWs must be free to seek assistance for their mental health. In one large, multicenter survey of 9,572 nurses in the United States, “stigma with myself” (reported by 17% of respondents) was a bigger barrier to seeking mental health support than “stigma with my colleagues” (reported by 8%).<sup>44</sup> Peers with similar backgrounds and shared experience may be best positioned to help coworkers work through this stigma; peer support programs can help HCWs support each other while normalizing the mental health challenges of responding to critical events.<sup>45</sup> Health systems must ensure readily



available mental health support services.<sup>12</sup> This support can range from online applications, virtual services, or psychosocial support teams. Formal debriefing programs with receptive administrators may further improve staff resilience.<sup>36</sup>

Similarly, we must not neglect physical wellness as an integral component of emotional wellness. Both moral distress and physiological deprivation (due to lack of sleep, nutrition, and physical activity among others) are major drivers of burnout in HCWs.<sup>35,46,47</sup> Sleep disruption, lack of nutrition, and inability to maintain physical fitness all increase rates of burnout as well as worsen cognitive function.<sup>20</sup> Health systems must ensure that their staff's basic needs are met, including food, clothing, shelter, and family care, particularly given the large number of women in health care who often carry heavy family responsibilities alongside their professional duties.<sup>20,48</sup> Appropriate concerns about personal and family safety can be alleviated with clear protocols, adequate PPE, and suitable training.<sup>49</sup> We must prioritize methods to permit HCWs to bolster these healthy practices to protect them during times of stress and to actively seek assistance when needed, including not just those engaged in direct bedside care but also sanitation, food service, unit clerks, and other key staff.<sup>39</sup>

Conditions of scarcity exacerbate already stressful conditions.<sup>50</sup> Although there are difficulties inherent to any disaster scenario, systems can mitigate their impact on the well-being of HCWs. Global shortages of nurses, respiratory therapists, and other key staff cannot be easily overcome in a rapid time frame by a single hospital given the long training period for these professions. However, hospitals can and must create the best possible working conditions under difficult times, optimizing the resources they have for their situation. These steps must be preceded by a paradigm shift, from a view of burnout as solely an individual issue to one in which burnout is treated as an individual outcome with a gamut of systems-based root causes that significantly affect the ability to maintain successful clinical operations in the short or long term.<sup>51</sup> Therefore, we provide seven suggestions for system-level guidance for staff management and policy development (Table 1, suggestions 6-12).

Key among the root causes of burnout are excessive workloads, inadequate time for recuperation and other key personal tasks, and lack of input into work conditions. During periods of intense demands, HCW stress is increased when autonomy is decreased and

conversely improves with greater input into decision-making.<sup>19</sup> Bedside staff can credibly assess work demands and have the flexibility needed to adjust to changing conditions.<sup>41</sup> As such, systems must ensure that HCWs have significant input into alterations of clinical operations, including policies regarding shift scheduling and care assignment. Staffing plans should allow for rotation between high-acuity and low-acuity settings, refrain from including mandatory overtime in plans, and incorporate all disciplines within the care team to offload nonspecialized aspects of care.<sup>52</sup> Flexible scheduling, as well as reductions in documentation requirements, may improve hospital functioning both in times of crisis and more generally.<sup>51</sup>

System resilience is also strengthened by the inclusion of HCWs in executive and institutional decisions. Regular training for disaster response, readily available psychological support, and a culture of safety in which staff can communicate concerns without fear of retribution can enhance baseline resilience. This decentralization of decision-making can encourage transparency and fairness in policy development.<sup>32</sup>

Effective communication within an organization is crucial to the resilience of a health care workforce. Information deficits pertaining to PPE availability, rationales for visitation policies, medication and equipment scarcity, and staffing shortages were identified as stressors during the COVID-19 pandemic.<sup>12,53</sup> Organizational leaders need to articulate the challenges at hand and the proposed solutions in a transparent and timely manner. Any proposed strategies from leadership need to be informed by clinicians' experiences and recommendations. To this end, communication is most effective when it is multidirectional, fostering vertical communication within the organizational structure as well as horizontal communication within clinical teams.<sup>45</sup>

None of these changes are easy, and many will require financial support from outside of the health systems. Shortages of HCWs predated COVID-19 and have been exacerbated by it, with high proportions considering leaving their professions because of pandemic stressors.<sup>54</sup> Long-term resiliency of health systems will require both private and government support and culture shifts. Training pipelines for the next generation of acute care professionals must be supported, with options to include loan repayment programs, tax benefits, and grant funding to increase the pool of clinical educators.<sup>16</sup> Similarly, programs to enhance

workforce retention must also be considered, such as support for childcare and determination of appropriate staffing levels.<sup>16</sup> Outside of limited acute events, regulators should limit overtime to no more than 50% over standard work hours and ideally no more than 25%.<sup>27</sup> Once health systems transition from preparation and mitigation to disaster response, these burnout prevention practices will need to be enhanced. Institutions that fail to prepare with resilience-building strategies will face greater difficulties in future responses from staff burnout.<sup>55</sup>

Our recommendations to bolster health care systems will require increased costs in money and personnel. US health systems faced dramatic revenue decreases in 2022,<sup>56</sup> despite or because of record-breaking profits by major private insurance companies. These financial problems are not unique to America; in early 2023, the United Kingdom's National Health Service is under extraordinary financial strain, with a clinical staff as overwhelmed as that in the United States.<sup>57</sup> Despite the costs that our recommendations will incur, the great majority of us and/or our loved ones will require hospital-based acute care at some point. If we want hospitals, EDs, medical wards, and ICUs to have skilled and experienced staff ready to provide care, there will be a cost.

During pandemic surges, hospitals around the world confronted the need to institute crisis standards of care, where triage methods are used to allocate scarce resources. Under crisis standards of care, critical resources for care, such as mechanical ventilators, are rationed to provide the best available care to the greatest number of patients, while recognizing that some patients could be denied access to care that would be considered routine in normal times. Although some jurisdictions formally instituted crisis standards of care during pandemic surges, bedside clinicians have often been forced to make the best (or least bad) decisions possible due to inadequate guidance from regulatory authorities.<sup>58</sup> The moral distress of withholding care from a critically ill patient due to shortages is potentially enormous. Establishment of dedicated triage teams, led by experienced clinicians not involved in direct patient care, may help relieve some of this distress.<sup>59</sup> Similarly, expanded access to effective palliative care, which can be delivered virtually for patients denied interventions such as mechanical ventilators, may reduce patient and family suffering and HCW distress.<sup>60</sup>

Although this article relates to the post-pandemic situation in the United States, the epidemic of burnout

and moral injury threatens critical care professionals around the world. The specific combination of fragmented care, for-profit insurance, and the corporate practice of medicine may be somewhat unique to the United States, but high proportions of HCWs in Asia,<sup>61,62</sup> Latin America,<sup>63</sup> Canada,<sup>64</sup> Africa,<sup>65</sup> Europe,<sup>66</sup> the United Kingdom,<sup>67</sup> and Australia<sup>68</sup> suffer similar degrees of distress and strain. A 2022 meta-analysis indicated that intensive care practice is a risk for burnout for physicians globally, particularly in younger doctors and in low-income to middle-income countries, and that burnout is in turn a risk for patient safety events.<sup>69</sup> It would appear that treating HCW burnout is good not only for HCWs but also for patient care and may likely reduce costs from turnover and a reduction in medical errors. Although the precise solution to the HCW staffing crisis will vary from country to country, we believe the basic components of those solutions will be similar: increased HCW engagement in decision-making, increased mental health support when needed, and improved work-life balance for all clinical staff.

We acknowledge the limitations and potential lack of generalizability of evidence compiled during this time of duress. Therefore, we provide suggestions for areas of future research (Table 1, suggestions 13-14). We still have much to learn about the key drivers of burnout and how these may differ between particular individuals and systems.<sup>70,71</sup> Understanding these drivers is essential to implement more effective approaches to support HCWs at risk and to measure critical outcomes. A systematic epidemiologic approach is required to define the prevalence of mental health disorders, burnout, and moral distress across all members of our interprofessional health care team and its impact on patients, health systems, the workforce, and society. Funding and support will be needed to achieve this understanding.

Globally, the majority of HCWs are women (75% in the United States); this is true for 88% of nurses, 44% of physicians, 68% of physician assistants, 89% of nurse practitioners, 61% of respiratory therapists, and 60% of pharmacists in the United States.<sup>72</sup> Much of the literature on burnout published during the pandemic is primarily survey-based and may not systematically assess a full cross-section of HCWs. Data on the impact of gender, race, and ethnicity on burnout and resilience are inconsistent, and generalizations drawn from these studies must be interpreted with caution. One message conveyed by them is consistent, however: no professional community of HCWs has been spared by the COVID-19 pandemic. One of the largest such

surveys of > 12,000 nurses, conducted by the American Nurses Foundation in November 2022, reported overall rates of burnout approaching 50%, with 32% of nurses with < 10 years of experience stating that they were not emotionally healthy.<sup>73</sup> Addressing burnout and resilience must include addressing inequities experienced by all HCWs.

We are presently at a post-pandemic breaking point for HCWs; strikes by HCWs for improved staffing ratios transiently crippled systems in the United Kingdom and New York City in early 2023.<sup>74</sup> Improvement efforts will not be successful without a greater societal commitment. Administrative burdens, inadequate staffing, and inequitable payment models are some of the many external factors contributing to burnout that will not easily be solved, even with a robust array of easily accessible mental health support options.<sup>48,71</sup> These solutions require leadership commitments to support meaningful research and quality improvement within a learning health system.<sup>51</sup> To support these efforts, organizational leaders and professional associations must play an important advocacy role to highlight the importance of these issues, to justify the changes in federal and private payment models, and to establish research funding priorities that will be needed to drive meaningful change.<sup>51,75</sup>

## Interpretation

The COVID-19 pandemic brought underlying issues of moral distress and burnout in the global health care workforce to the forefront. Although we have made strides in reducing disease severity and hospitalizations due to COVID-19, these baseline deficiencies in our health care systems that were exacerbated by the pandemic remain. Without preventative measures in place to protect the well-being of the health care workforce, we risk continued loss of critical personnel to address future disasters. It is crucial that key stakeholders with intimate knowledge of the health care workforce be involved in developing future government and health system policies. It is the hope of the TFMCC that the suggestions provided in this document offer useful guidance toward sustaining our health care workforce for the future.

## Financial/Nonfinancial Disclosures

None declared.

## Acknowledgments

**Author contributions:** All authors contributed to the design and analysis of the study and the writing of the manuscript.

**Other contributions:** We are grateful to Ashley Fuchs, MS, Division of Pulmonary, Allergy, Critical Care and Sleep Medicine at the University

of Minnesota and Christie Martin, PhD at the University of Minnesota School of Nursing for their tireless support to the Task Force for Mass Critical Care. We thank Alicia A. Livinski, MPH, MA, at the National Institutes of Health Library for the literature searching and citation management support for this project.

**\*The Task Force for Mass Critical Care Writing Group:** Anwar Al-Awadhi, MD (Mubarak Al-Kabeer Hospital-Kuwait); Timur Alptunaer, MD (Leonard Chabert Medical Center, Houma, LA); Amado A. Baez, MD, MPH, PhD (Medical College of Georgia); Marie R. Baldisseri, MD, MPH (University of Pittsburgh Medical Center); Karyn D. Baum, MD, MSED, MHA (University of Minnesota); Kasey R. Bowden, MSN, FNP, AGANP (University of Colorado); Richard S. Branson, MSc (University of Cincinnati); Lisa D. Burry BScPharm, PharmD, FCCP (University of Toronto); Michael Christian, MD, MSc (British Columbia Emergency Health Services, Provincial Health Services Authority); Alope Chakravarti, MD (Icahn School of Medicine at Mount Sinai); Timothy M. Dempsey, MD, MPH, FCCP (Travis Air Force Base); Asha V. Devereaux, MD, MPH (Sharp Coronado Hospital); Jeffrey R. Dichter, MD (University of Minnesota); Guillermo Dominguez-Cherit, MD (Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico City); James Downar, MDCM, MHS (University of Ottawa); David J. Dries, MD, MSE, FCCP (Regions Hospital and the University of Minnesota, St. Paul, Minnesota); Sharon Einav, MD, MSc (Shaare Zedek Medical Center); Henry J. Feldman, MD (Beth Israel Deaconess Medical Center); Jaimie R. Felzer MD, MPH (Mayo Clinic); James Geiling, MD, MPH, FCCP (Geisel School of Medicine at Dartmouth); Marya Ghazipura, PhD, MS, MPhil (ZS Associates, New York); Ramon Gist, MD (State University of New York Downstate Health Science University); Kelly Griffin, MD (New York Presbyterian Hospital Weill Cornell); Mitchell T. Hamele, MD (Tripler Army Medical Center); Gavin H. Harris, MD (Emory University); Kiersten N. Henry, DNP (MedStar Montgomery Medical Center); Atilla J. Hertelendy, PhD (Florida International University); John Hick, MD (University of Minnesota); Tanzib Hossain, MD, MS (New York University Grossman School of Medicine); Meredith Huffines, MS, BA, RN (University of Maryland); Richard C. Hunt, MD (Administration for Strategic Preparedness & Response U.S. Department of Health & Human Services); Nathaniel Hupert, MD, MPH (Weill Cornell Medicine); Sameer S. Kadri, MD (Critical Care Medicine Department, NIH Clinical Center); Sarah Kesler, MD, MPA (University of Minnesota); Mary A. King, MD (University of Washington, Seattle, Washington); Kristi L. Koenig, MD (County of San Diego, Emergency Medical Services Office, Public Safety Group – San Diego County Fire, San Diego, California); Deborah A. Levy, PhD, MPH (University of Nebraska Medical Center College of Public Health); Alicia Livinski (National Library of Medicine); Anne Marie Martland, MSN, ACNP-BC (Scripps Health San Diego); Ryan C. Maves, MD (Wake Forest University School of Medicine); Anuj Mehta, MD, MS (Denver Health and Hospital Authority); Steven Mitchell, MD (University of Washington Seattle); Vikramjit Mukherjee, MD, MBBS (New York University Grossman School of Medicine); Mangala Narasimhan, DO (Donald and Barbara Zucker School of Medicine at Hofstra/Northwell); Alexander S. Niven, MD (Mayo Clinic); Juan Ochoa, MD (Ochsner Clinic, New Orleans, Louisiana); Doug Orloff, MD, PhD (SCL Health System, Denver, Colorado); J. Scott Parrish, MD (Naval Medical Center San Diego); Jason Persoff, MD (University of Colorado School of Medicine); Mary Jane Reed, MD (Geisinger Medical Center); Gilbert Seda, MD, PhD (Scripps Hospital Chula Vista); Jaspal Singh, MD, MHA, MHS (Atrium Health); Jordan Selzer, MD (George Washington University); Charles L. Sprung, MD, FCCP (Hebrew University of Jerusalem); Pritish K. Tosh, MD (Mayo Clinic); Amit Uppal, MD (New York University Grossman School of Medicine); Marian Von-Maszewski, MD (MD Anderson).

**Disclaimer:** For Richard C. Hunt: The opinions and assertions contained herein are those of the writing group participant and does not reflect the official views or position of the Agency for Strategic Preparedness and Response nor the United States Government.

**Additional information:** The e-Appendix, e-Figure, and e-Table are available online under "Supplementary Data."

## References

1. Worldometer. COVID-19 Coronavirus Pandemic. Accessed February 10, 2023. <https://www.worldometers.info/coronavirus/>
2. World Health Organization. Joint statement on WHO's estimates of health and care worker deaths due to Covid-19. October 21, 2021. Accessed February 8, 2023. <https://www.who.int/news/item/21-10-2021-who-and-partners-call-for-action-to-better-protect-health-and-care-workers-from-covid-19>
3. Danet Danet A. Psychological impact of COVID-19 pandemic in Western frontline healthcare professionals. A systematic review. *Med Clin (Engl Ed)*. 2021;156(9):449-458.
4. Ezzat A, Li Y, Holt J, Komorowski M. The global mental health burden of COVID-19 on critical care staff. *Br J Nurs*. 2021;30(11):634-642.
5. Maunder RG, Heeney ND, Kiss A, et al. Psychological impact of the COVID-19 pandemic on hospital workers over time: relationship to occupational role, living with children and elders, and modifiable factors. *Gen Hosp Psychiatry*. 2021;71:88-94.
6. Moll V, Meissen H, Pappas S, et al. The coronavirus disease 2019 pandemic impacts burnout syndrome differently among multiprofessional critical care clinicians—a longitudinal survey study. *Crit Care Med*. 2022;50(3):440-448.
7. Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep*. 2020;22(8):43.
8. Sanghera J, Pattani N, Hashmi Y, et al. The impact of SARS-CoV-2 on the mental health of healthcare workers in a hospital setting—a systematic review. *J Occup Health*. 2020;62(1):e12175.
9. Zhang H, Shi Y, Jing P, Zhan P, Fang Y, Wang F. Posttraumatic stress disorder symptoms in healthcare workers after the peak of the COVID-19 outbreak: a survey of a large tertiary care hospital in Wuhan. *Psychiatry Res*. 2020;294:113541.
10. Gualano MR, Sinigaglia T, Lo Moro G, et al. The burden of burnout among healthcare professionals of intensive care units and emergency departments during the COVID-19 pandemic: a systematic review. *Int J Environ Res Public Health*. 2021;18:8172.
11. Hu Z, Wang H, Xie J, et al. Burnout in ICU doctors and nurses in mainland China—a national cross-sectional study. *J Crit Care*. 2021;62:265-270.
12. Azoulay E, Cariou A, Bruneel F, et al. Symptoms of anxiety, depression, and peritraumatic dissociation in critical care clinicians managing patients with COVID-19. A cross-sectional study. *Am J Respir Crit Care Med*. 2020;202(10):1388-1398.
13. Sexton JB, Adair KC, Proulx J, et al. Emotional exhaustion among US health care workers before and during the COVID-19 pandemic, 2019-2021. *JAMA Netw Open*. 2022;5(9):e232748.
14. InformedHealth.org. Institute for Quality and Efficiency in Health Care (IQWiG). Depression: what is burnout? Accessed February 8, 2023. <https://www.ncbi.nlm.nih.gov/books/NBK279286>
15. Jahan I, Ullah I, Griffiths MD, Mamun MA. COVID-19 suicide and its causative factors among the healthcare professionals: case study evidence from press reports. *Perspect Psychiatr Care*. 2021;57(4):1707-1711.
16. Costa DK, Friese CR. Policy strategies for addressing current threats to the US nursing workforce. *N Engl J Med*. 2022;386(26):2454-2456.
17. Stuijzfand S, Deforges C, Sandoz V, et al. Psychological impact of an epidemic/pandemic on the mental health of healthcare professionals: a rapid review. *BMC Public Health*. 2020;20(1):1230.
18. Shechter A, Diaz F, Moise N, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. *Gen Hosp Psychiatry*. 2020;66:1-8.
19. El-Hage W, Hingray C, Lemogne C, et al. Health professionals facing the coronavirus disease 2019 (COVID-19) pandemic: what are the mental health risks? [in French]. *Encephale*. 2020;46(3S):S73-S80.
20. Tomlin J, Dalgleish-Warburton B, Lamph G. Psychosocial support for healthcare workers during the COVID-19 pandemic. *Front Psychol*. 2020;11:1960.
21. Albott CS, Wozniak JR, McGlinch BP, Wall MH, Gold BS, Vinogradov S. Battle buddies: rapid deployment of a psychological resilience intervention for health care workers during the COVID-19 pandemic. *Anesth Analg*. 2020;131(1):43-54.
22. Valley TS, Schutz A, Nagle MT, et al. Changes to visitation policies and communication practices in Michigan ICUs during the COVID-19 pandemic. *Am J Respir Crit Care Med*. 2020;202(6):883-885.
23. US Department of Health and Human Services. HHS Announces \$103 Million from American Rescue Plan to Strengthen Resiliency and Address Burnout in the Health Workforce. July 16, 2021. Accessed February 8, 2023. <https://public3.pagefreezer.com/browse/HHS.gov/30-12-2021T15:27/https://www.hhs.gov/about/news/2021/07/16/hhs-announces-103-million-arp-funding-to-address-health-workforce-burnout.html>
24. United States Congress, 117th Congress. Dr. Lorna Breen Health Care Provider Protection Act, H.R.1667 (2021-2022). Accessed February 8, 2023. <https://www.congress.gov/bill/117th-congress/house-bill/1667>
25. Office of the US Surgeon General, US Department of Health and Human Services. Addressing Health Worker Burnout. The US Surgeon General's Advisory on Building a Thriving Health Workforce. Accessed February 8, 2023. <https://www.hhs.gov/surgeongeneral/priorities/health-worker-burnout/index.html>
26. Christian MD, Devereaux AV, Dichter JR, Rubinson L, Kissoon N. Task Force for Mass Critical Care. Introduction and executive summary: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*. 2014;146(4 Suppl):8S-34S.
27. Dichter JR, Devereaux AV, Sprung CL, et al. Mass critical care surge response during COVID-19: implementation of contingency strategies—a preliminary report of findings from the Task Force for Mass Critical Care. *Chest*. 2022;161(2):429-447.
28. Garritty CM, Norris SL, Moher D. Developing WHO rapid advice guidelines in the setting of a public health emergency. *J Clin Epidemiol*. 2017;82:47-60.
29. Morgan RL, Florez I, Falavigna M, et al. Development of rapid guidelines: 3. GIN-McMaster Guideline Development Checklist extension for rapid recommendations. *Health Res Policy Syst*. 2018;16(1):63.
30. Jaeschke R, Guyatt GH, Dellinger P, et al. Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive. *BMJ*. 2008;337:a744.
31. Alonso-Coello P, Schunemann HJ, Moberg J, et al. GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ*. 2016;353:i2016.
32. Maunder RG, Leszcz M, Savage D, et al. Applying the lessons of SARS to pandemic influenza: an evidence-based approach to mitigating the stress experienced by healthcare workers. *Can J Public Health*. 2008;99(6):486-488.
33. Moss M, Good VS, Gozal D, Kleinpell R, Sessler CN. An official Critical Care Societies Collaborative Statement—burnout syndrome in critical care health care professionals: a call for action. *Chest*. 2016;150(1):17-26.
34. Kerlin MP, Silvestri JA, Klaiman T, Gutsche JT, Jablonski J, Mikkelsen ME. Critical care clinician wellness during the COVID-19 pandemic: a longitudinal analysis. *Ann Am Thorac Soc*. 2022;19(2):329-331.
35. Farahat SA, Amin OR, Hamdy HS, Fouad MM. The impact of work-related stress on the cognition domain of executive functioning of health care workers during the COVID-19 pandemic. *Int Arch Occup Environ Health*. 2022;95(5):1079-1090.
36. Azizoddin DR, Vella Gray K, Dundin A, Szyld D. Bolstering clinician resilience through an interprofessional, web-based nightly debriefing program for emergency departments during the COVID-19 pandemic. *J Interprof Care*. 2020;34(5):711-715.
37. Dzau VJ, Kirch D, Nasca T. Preventing a parallel pandemic—a national strategy to protect clinicians' well-being. *N Engl J Med*. 2020;383(6):513-515.

38. Kakemam E, Chegini Z, Rouhi A, Ahmadi F, Majidi S. Burnout and its relationship to self-reported quality of patient care and adverse events during COVID-19: a cross-sectional online survey among nurses. *J Nurs Manag.* 2021;29(7):1974-1982.
39. DePierro J, Katz CL, Marin D, et al. Mount Sinai's Center for Stress, Resilience and Personal Growth as a model for responding to the impact of COVID-19 on health care workers. *Psychiatry Res.* 2020;293:113426.
40. Kunzler AM, Helmreich I, Chmitorz A, et al. Psychological interventions to foster resilience in healthcare professionals. *Cochrane Database Syst Rev.* 2020;7(7):CD012527.
41. Rieckert A, Schuit E, Bleijenberg N, et al. How can we build and maintain the resilience of our health care professionals during COVID-19? Recommendations based on a scoping review. *BMJ Open.* 2021;11(1):e043718.
42. Davis M, Batcheller J. Managing moral distress in the workplace: creating a resiliency bundle. *Nurse Lead.* 2020;18(6):604-608.
43. Hedderman E, O'Doherty V, O'Connor S. Mindfulness moments for clinicians in the midst of a pandemic. *Ir J Psychol Med.* 2021;38(2):154-157.
44. American Nurses Foundation. Pulse on the Nation's Nurses COVID-19 Survey Series: Mental Health and Wellness Survey 3. Accessed February 8, 2023. <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/pulse-on-the-nations-nurses-covid-19-survey-series-mental-health-and-wellness-survey-3-september-2021/>
45. Wu AW, Connors C, Everly GS Jr. COVID-19: peer support and crisis communication strategies to promote institutional resilience. *Ann Intern Med.* 2020;172(12):822-823.
46. Azoulay E, De Waele J, Ferrer R, et al. Symptoms of burnout in intensive care unit specialists facing the COVID-19 outbreak. *Ann Intensive Care.* 2020;10(1):110.
47. Fumis RRL, Costa ELV, Dal'Col SVC, Azevedo LCP, Pastore Junior L. Burnout syndrome in intensive care physicians in time of the COVID-19: a cross-sectional study. *BMJ Open.* 2022;12(4):e057272.
48. Ripp J, Peccoraro L, Charney D. Attending to the emotional well-being of the health care workforce in a New York City health system during the COVID-19 pandemic. *Acad Med.* 2020;95(8):1136-1139.
49. Huang F, Lin M, Sun W, Zhang L, Lu H, Chen WT. Resilience of frontline nurses during the COVID pandemic in China: a qualitative study. *Nurs Health Sci.* 2021;23(3):639-645.
50. Kok N, van Gurp J, Teerenstra S, et al. Coronavirus disease 2019 immediately increases burnout symptoms in ICU professionals: a longitudinal cohort study. *Crit Care Med.* 2021;49(3):419-427.
51. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc.* 2017;92(1):129-146.
52. Reese SM, Johnson J, Edwards J, Olivetti M, Buszkiewicz S. Innovative partnership between intensive care unit nurses and therapists to care for patients with COVID-19. *Crit Care Nurse.* 2022;42(1):44-54.
53. Werner EA, Aloisio CE, Butler AD, et al. Addressing mental health in patients and providers during the COVID-19 pandemic. *Semin Perinatol.* 2020;44(7):151279.
54. Petrisor C, Breazu C, Doroftei M, Maries I, Popescu C. Association of moral distress with anxiety, depression, and an intention to leave among nurses working in intensive care units during the COVID-19 pandemic. *Healthcare (Basel).* 2021;9(10):1377.
55. Pollock A, Campbell P, Cheyne J, et al. Interventions to support the resilience and mental health of frontline health and social care professionals during and after a disease outbreak, epidemic or pandemic: a mixed methods systematic review. *Cochrane Database Syst Rev.* 2020;11:CD013779.
56. Emerson J. "The house always wins": Insurers' record profits clash with hospitals' hardship. *Becker's Payer Issues.* January 3, 2023. Accessed February 8, 2023. <https://www.beckerspayers.com/payer/the-house-always-wins-health-systems-face-worst-finances-in-decades-as-payers-rake-in-record-profits.html>
57. Raven D. The NHS crisis shows the self-sacrifice of staff can no longer prop up the system. *BMJ.* 2023;380:41.
58. Hick JL, Hanfling D, Wynia MK, Toner E. Crisis standards of care and COVID-19: what did we learn? How do we ensure equity? What should we do? *NAM Perspect.* 2021;2021. <https://doi.org/10.31478/202108e>
59. Maves RC, Downar J, Dichter JR, et al. Triage of scarce critical care resources in COVID-19: an implementation guide for regional allocation: an expert panel report of the Task Force for Mass Critical Care and the American College of Chest Physicians. *Chest.* 2020;158(1):212-225.
60. Norris SE, Strumph K, Rahmani NE. Pediatric palliative care when COVID-19 positive adults are dying in a children's hospital. *Pediatrics.* 2020;146(3):e20201570.
61. Kodera S, Kimura Y, Tokairin Y, Iseki H, Kubo M, Shimohata T. Physician burnout in general hospitals turned into coronavirus disease 2019 priority hospitals in Japan. *JMA J.* 2022;5(1):118-123.
62. Xiao Y, Dong D, Zhang H, et al. Burnout and well-being among medical professionals in china: a national cross-sectional study. *Front Public Health.* 2021;9:761706.
63. Molina Zavala BI, Zamora-Macorra M, Martinez Alcantara S. Working conditions and the components of burnout among nursing staff in a public hospital in Mexico City. *J Nurs Res.* 2022;30(4):e219.
64. Gajjar J, Pullen N, Li Y, Weir S, Wright JG. Impact of the COVID-19 pandemic upon self-reported physician burnout in Ontario, Canada: evidence from a repeated cross-sectional survey. *BMJ Open.* 2022;12(9):e060138.
65. Iyer S, Suleman S, Qiu Y, Platt S. Risk factors for physician burnout: a perspective from Tanzania. *Pan Afr Med J.* 2022;41:298.
66. Hiver C, Villa A, Bellagamba G, Lehucher-Michel MP. Burnout prevalence among European physicians: a systematic review and meta-analysis. *Int Arch Occup Environ Health.* 2022;95(1):259-273.
67. Zhou AY, Hann M, Panagioti M, et al. Exploring associations between stressors and burnout in trainee doctors during the COVID-19 pandemic in the UK. *Acad Psychiatry.* 2022;46(6):723-728.
68. Armstrong SJ, Porter JE, Larkins J-A, Mesagno C. Burnout, stress and resilience of an Australian regional hospital during COVID-19: a longitudinal study. *BMC Health Services Research.* 2022;22(1):1115.
69. Hodkinson A, Zhou A, Johnson J, et al. Associations of physician burnout with career engagement and quality of patient care: systematic review and meta-analysis. *BMJ.* 2022;378:e070442.
70. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry.* 2020;7(6):547-560.
71. National Academies of Sciences, Engineering, Medicine. National Academy of Medicine, Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being. Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being. Washington, DC: National Academies Press. Accessed February 8, 2023. <https://pubmed.ncbi.nlm.nih.gov/31940160/>
72. Bureau of Labor Statistics, US Department of Labor. Labor Force Statistics from the Current Population Survey. Accessed February 12, 2023. <https://www.bls.gov/cps/cpsaat11.htm>
73. American Nurses Foundation. Pulse on the Nation's Nurses Survey Series: Annual Assessment Survey. Accessed February 9, 2023. <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/annual-survey-third-year/>
74. Gooch K. What risking tensions mean for hospital workers in 2023. *Beckers Hospital Review.* January 17, 2023. Accessed February 8, 2023. <https://www.beckershospitalreview.com/hr/what-rising-tensions-mean-for-hospital-workers-in-2023.html>
75. Rinne ST, Shah T, Anderson E, et al. Professional societies' role in addressing member burnout and promoting well-being. *Ann Am Thorac Soc.* 2021;18(9):1482-1489.