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COMMENTARY

Frontline Health-Care Workers in Combating the COVID-19: Respect and Reflect

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Abstract: The ongoing coronavirus disease has heightened enormous concern in the global community. China implemented extraordinary public health measures to take the major transmission hotspots under control at great socioeconomic cost. Frontline health-care workers have shown their commitment and accountability in the fight against the epidemic outbreak. This commentary acknowledges their contribution and offers important insights for devising future strategies in enhancing preparedness and response competencies among the health-care workforce to manage future epidemic events.

Keywords: COVID-19, coronavirus, health-care worker, outbreak, preparedness and response

The current coronavirus disease (COVID-19) first reported from Wuhan, China, in late December 2019 is the third time a fatal zoonotic coronavirus has jumped species to infect humans in as many decades[1] and sustained human-to-human transmission via droplets, contact, and fomites have been confirmed.[2] Despite unprecedentedly strict containment measures implemented in Wuhan and further afield since January 23, 2020, the disease is rapidly expanding throughout China and into proximal and distant countries. As of May 31, 2020, global confirmed COVID-19 cases staggeringly topped 6 million and the death toll reached 369 106, with the numbers still surging across 216 countries, areas or territories worldwide.[3] Chinese government mobilized extraordinary medical action in response to the public health crisis.[4] Two new hospitals (Huoshenshan and Leishenshan hospitals) and sixteen makeshift hospitals (Fangcang shelter hospitals) were built in the shortest time to isolate, treat, and triage-infected patients. A total of 346 medical teams comprised 42,600 health-care workers (HCWs; nurses 66.5%, physicians 28.5%, pharmacists 0.1%, epidemiologists 1.1%, and laboratory technicians 1.3%) were conscripted to help combat COVID-19 in the disease-ravaged epicenter.[5]

Facing such a large-scale public health emergency, HCWs are under excessively physical and psychological pressures, which are exacerbated by patients with increasingly complex conditions, inadequate staffing and medical resources, and other constraints. Especially in the initial phase of the outbreak, what had been unveiled about the virus was only the tip of the iceberg. By contrast, the number of patients seeking medical attention shortly outpaced the capacity of local health systems. Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia was first issued by the National Health Commission of China in middle January and subsequently updated six times within just 48 days.[6] HCWs suffered an extreme

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overload of work to provide medical care for a surge of arriving patients. What is worse was that the personal protective equipment, such as masks, respirators, goggles, face shields, and gowns, became inaccessible luxuries for a period of time as failing to make adequate reserves, coupled with low productivity during the long Chinese New Year holiday. In some instances, HCWs had resorted to using raincoats or plastic bags for protection and goggles were repeatedly recycled after disinfection. Netizens then sighed on social media platforms that frontline HCWs were almost "naked" in the fight against the novel coronavirus. As an emerging infectious disease not yet fully understood, with no vaccine or specific antiviral treatment available, COVID-19 has also added to the mental strain to HCWs who are at elevated risk of exposure to infection.

Nevertheless, health-care warriors at the frontline have shown high levels of professionalism, commitment, and perseverance in the anti-epidemic fight. Their valuable work of extending the "window of opportunity" to halt virus spread had not only secured the health of the Chinese people but also contributed to safeguarding global public health. China has now ascended from the darkest moment and achieved a decisive phased victory in the battle against the virus. Governments and health systems should fully recognize their critical contributions. While HCWs are professional personnel, they are also human beings, who definitely deserves our utmost respect and gratitude.

Emerging and reemerging infectious diseases recognizing no geographic borders are now more than ever considered threats to global health. Alternatively, these global health threats can be taken as opportunities to assess the preparedness and response of modern health systems. The recent emergence of the highly contagious COVID-19, caused by the novel coronavirus in central China has been reminiscent of the outbreaks of the severe acute respiratory syndrome (SARS) coronavirus as well as the Middle East respiratory syndrome (MERS) coronavirus, during which about 21.1% (1706/8096)[7] and 19.1% (402/2106, data reported from Saudi Arabia)[8] of confirmed cases occurred in HCWs, respectively. The SARS first identified in Southern China in November 2002 served as a painful lesson of nosocomial transmission. Hospital-based infection acted like an accelerator, accounting for 72% of SARS cases in Toronto and 55% of probable cases in Taiwan[9] and at the onset of the outbreak in mainland China, over 90% of the SARS patients were frontline HCWs.[10] Similarly, MERS infection was characterized by inter and intra-hospital spread. The largest reported MERS outbreak was in Jeddah, in the spring of 2014, where the majority of patients were health-care-associated infections and one-third of the cases were among HCWs.[11] Serious outbreaks in HCWs undermined involved health systems and fueled public fear and distrust.

At the early stage of the ongoing COVID-19 epidemic, hospital-related transmission was presumed as the mechanism of infection for 41% of affected patients in one of the designated hospitals.[12] Infected HCWs in China have so far climbed to 3387 and at least 22 HCWs have sacrificed their lives.[13] The startling scale of HCWs infection is indicative of the fact that lessons from the two prior epidemics of coronavirus were not heeded and we were still ill-prepared to address threats posed by newly public health emergencies. The initial experience from combating COVID-19 regarding government transparency, organizational capacity, and response mechanism has been extensively discussed,[14–16] while the role of HCWs received scanty attention. We hereby would like to emphasize three aspects of reflection from HCWs' perspective.

Firstly, continued vigilance and situational awareness are necessary not only for early case detection but also for occupational protection. Peak timing of HCWs acquiring COVID-19 occurred in late January,[17] underscoring the importance of increasing awareness and implementing basic isolation precautions at all times, not just during the outbreak period. Early infected people with subclinical or atypical manifestations most probably went undetected and some of them had visited various hospital departments. As the disease is unfolding, evidence of asymptomatic people transmitting infection with high efficiency is accumulating.[18] Many HCWs caught unaware might not fully adhere to recommended infection prevention and control measures in the first place and could become infected through close contact with asymptomatic patients or mildly symptomatic patients. A retrospective study focused on the first batch of 48 HCWs hospitalized for COVID-19 revealed that only six of them working in high-risk settings (isolation wards and fever clinic) were aware of the possibility of exposure to infected patients and many infected personnel were located in departments that are considered low-risk.[19] A newly emerging infectious disease is always wrapped in mystery. It takes time to ascertain the specific pathogen, transmission modes, and infective potency. While moving through uncharted territory, HCWs, regardless of their department, can never attach too much importance to staying high alert.

Secondly, strengthening emergency preparedness and response capacities is crucial for HCWs. The past two decades have seen remarkable improvements in China's public health infrastructure and capacity, as well as professional competency among health personnel. However, dealing with overwhelming epidemics deviates from day-to-day clinical practices. "Our limited knowledge and skills on infectious diseases stand in stark contrast to the current requirements of such an outbreak" a HCW transferred temporarily from other department said, and another emphasized that "I need comprehensive training as this is the first time I am enrolled in epidemic relief".[20] Obviously, gaps still exist between the expected preparedness and response capacities and the demonstrated. This seems to especially be the case for those who engaged outside of emergency medicine, critical care, or infectious diseases. Resource provision in individual HCW's preparedness remains a linchpin of working on extinguishing epidemics and not adding to the burden of response by unsafe practices. The knowledge, skills, and abilities required for epidemic outbreak management possessed by HCWs were recognized as the foundation of personal resources in preparedness and response. Standardized and decentralized training programs that employ an easily integrated-into-existing-system approach should be developed and, importantly, sustained for all HCWs to maintain familiarity with guidelines and protocols for infection control and prevention. System-wide support for innovative educational approaches based on the fifth-generation network service, popular mobile applications, and interactive simulation drills might also be of use to facilitate the acquisition of up-to-date personal resources.

Thirdly, HCWs' psychological preparedness should not be discounted. Those at the frontline in combatting COVID-19 are under multiple psychological pressures, including facing and treating critically ill patients, prolonged exposure to the virus, protracted isolation from families, and even experiencing colleagues being infected or bereavement of loved ones. One multicenter survey comprised 1563 frontline HCWs found the prevalence of depression to be 50.7%, of anxiety to be 44.7%, and of stress-related symptoms to be 73.4%.[21] In this regard, psychological qualifications should also be prioritized to develop among HCWs, before, during, and after their deployment. Effective preparedness in the psychological domain can be a positive support to HCWs, and hence to fulfilling their role to deliver psychological care for epidemic victims, by giving them the inner resources of defeating negative emotions and stress. Additionally, to recover or "bounce back" after an event proved to be beset with difficulties. Thus, it is far better to invest in preparedness to minimize emotional and psychological trauma beforehand.

Numerous episodes of infectious disease outbreaks have emerged across the globe in recent years without warning. Every time confronted with the challenge, we have been so keen on investment to update our armamentarium, support research efforts, and outwit the pathogens. Yet, fine-focused endeavors generally subside along with pathogens. The COVID-19 has triggered alarms, once again, that improvisation is far from enough to cope with prevailing epidemics, neither for organizations nor for the individual HCW. To achieve occupational safety and health amid future unexpected infectious disease outbreaks, all HCWs must strengthen the awareness of self-protection, continuously improve emergency preparedness and response capacities, and equip themselves with enough psychological resilience. The COVID-19 pandemic has gradually faded in China and will eventually fade worldwide, but we hope that this lesson learned will be remembered, digested, and motivated long afterwards.

Disclosure

The authors report no conflicts of interest in this work.

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