Multilevel and amplified effects of COVID-19 pandemic on health workers

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Over two years since its emergence, the COVID-19 pandemic has raged across the globe, taking lives, and causing disruption to the economic and other living activities of people in every country in the world. Even many of the most resourced and resourceful health systems were overwhelmed by sudden escalated hospitalization and death tolls, severe shortages of personal protective equipment, uncertainty of disease progression, and lack of access to effective treatment. At the centre of such devastating chaos was, and has still been, the healthcare workforce. Since the beginning of the pandemic, across nations, healthcare workers have been at the forefront of combating this deadly virus, having their safety, physical and mental health of themselves and their loved ones at risk to provide life-saving care to other people.

A wealth of literature has been devoted to studying the impacts of the pandemic on the life and work of healthcare workers. Salient issues, to name a few, include long working hours, adapting to changing requirements and emergence of new information regarding the disease, dealing with escalated mortality in patients and lack of protective equipment, care for family members while having to maintain the high standard of their job in an extremely difficult time. These hardships do not come in isolation; instead, they arise simultaneously, yet efforts to ‘map’ these stressors and hardships in a system of causal factors and impacts have been lacking in current literature. To potentially fill this gap, we propose a model that includes multilevel and amplified dynamics of the effects of the COVID-19 pandemic on health workers. Empirical data supporting this model, which were reported elsewhere were collected as a part of our comprehensive survey on 2500 healthcare workers in Vietnam during the fourth wave – the most severe and deadly wave of the pandemic in the country.

Socio-ecological models of health provide useful tools to piece together the evidence discovered through both quantitative and qualitative studies. The impacts of COVID-19 pandemic on healthcare workers, as visualized in Figure 1, are multilevel and re-enforcing between and within three layers, including (i) individual predisposing factors, (ii) individual psychosocial outcomes of healthcare jobs and required tasks during COVID-19 pandemic, and (iii) substantial changes in working environment and performance. The concurrent presence of elements within each level, for instance the increased workload, complexity of conditions, and inconsistent guidelines and training reinforce each other to create stress proliferation and burnout among health workers—which in turn impair their physical and mental health status. Considering any element in isolation would thus prevent a complete understanding of issues faced by healthcare workers and consequently prevent forming an effective intervention. Solutions targeting any aspect of the work environment per se, for instance, would be insufficient.

It is thus logical to recommend interventions being developed as a package concurrently targeting multiple elements of the working environment simultaneously. Such ‘package’ of intervention would require mobilization of resources that go beyond any single governmental or non-governmental organization. Instead, involvement of entities across industries and levels of authority, within a country and on an international level, is necessary. Policies for health system strengthening, such as optimizing operation and coordination, staffing and stuffng, building capacity, recognizing, and motivating are urgently needed for health workers. Specifically, central, and local authorities can deliver immediate financial allowance for COVID-19 activities involvement, along with longer-term allocation of resources for epidemic preparedness activities such as developing contingency plans, updating training and guidance, instituting mechanisms for coordinating multi-centre and inter-provincial workforce (concerning central ministries and local governments). Mental health support services and childcare and family care services especially catering for healthcare workers and their families should be made available. International non-governmental organizations can involve in any

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initiative by providing technical support and sharing their expertise and experience. These collaborations would require effective communications, entail potential lengthy negotiation and difficult compromise from all parties in case of conflicting interests and limited resources. Thus, they need to be built firmly on the fundamental shared understanding of the multilevel and amplified mechanism of pandemic impacts on healthcare workers.

Devastated and destructive as it has been, the COVID-19 pandemic, with its scale and duration, has created the urge to rethink many aspects of healthcare. The healthcare workforce who sacrificed and suffered through many previous epidemics, once again comes into the ‘spotlight’ of attention. Before this attention to the healthcare workforce fades, it is critical to develop a systematic understanding of pandemic impacts on their work and life to develop the necessary steps to guide program monitoring and evaluation and research as well as implement solutions that can reduce their heavy burden. This framework also helps characterise root causes of some secondary outcomes, including poor health behaviours, substance use, family conflict, poor quality of patient care, neglecting family obligations and caregiving, as well as morbidity and mortality among healthcare workers. Moreover, such understanding would go beyond the COVID-19 pandemic to support the development of effective epidemic preparedness globally.

**Contributors**
Bach Xuan Tran: conceptualization, data analysis, writing, revision of manuscript; Giang Thu Vu: literature search, data analysis and writing; Carl A. Latkin: revision of manuscript; Roger C.M. Ho: revision of manuscript.

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The authors declare no conflict of interest.

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