Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Early reflection on the global impact of COVID19, and implications for physiotherapy

Keywords: COVID19; Coronavirus; Physiotherapy; Physical therapy

On March 11, 2020, the World Health Organization (WHO) elevated the status of the novel coronavirus (COVID19) to a pandemic. Although the assessments are changing rapidly, COVID19 has now infected and taken the lives of thousands. Since the first cases appeared in late 2019, COVID19 has unleashed widespread shock on public and clinical health systems that struggle to respond to the surge, and on global economic productivity as workers are increasingly restricted from participation. A profound anxiety is spreading almost as quickly as the disease itself.

The growth in the number of new cases, alongside the sobering reality that potential vaccines are months if not years away [1], have led to an unprecedented response even when compared to other infectious disease outbreaks. An increasing number of high-income countries (HICs) have partially or completely closed borders and significantly restricted human movement with the ambition of viral containment. Meanwhile, some low and middle income (LMICs) countries with fragile infrastructure fear being unable to meet the health needs during an pandemic [2,3]. Given these realities, the WHO has strongly advocated that the best approach to "flatten the curve" of newly identified cases is through robust and responsible public health measures at the individual, community, national and global levels. Dr. Michael Ryan, the WHO Executive Director of Health Emergencies, went so far as to suggest that "We share failure in the same way that we share success" [4] and that all citizens have a role to play in this global fight.

Based on the assessments from the WHO and other public health agencies, COVID19 primarily attacks the lower respiratory system, and the transmission vector seems to be mostly through respiratory droplets from coughing, sneezing and close contact. Cai et al. have suggested that the virus might also be spread indirectly through "virus contamination of common objects, virus aerosolization in a confined space, or spread from asymptomatic infected persons" [5]. Either way, the segment of the population who seems to be most affected includes persons older than 50 years, and those with pre-existing chronic diseases [6]. The usual clinical manifestation after an incubation period of 4 days includes fever, dry and persistent cough, myalgia, and shortness of breath. Rare but life-threatening cases result in pneumonia and acute respiratory distress syndrome (ARDS). According to the Centers for Disease Control and Prevention (CDC), up to 80% of infected people will experience mild to moderate illness requiring few interventions, but the remaining will be seriously affected and will require intensive medical care. Although difficulty to accurately estimate, the WHO reports a case fatality rate of 3.4% [7]. This estimate nevertheless camouflages the reality that fatality rates differ by age, and for those over 80 year the rate is closer to 15%.

Whatever the vector of transmission, it is known that once contracted viral infection can cause physical and psychological complications; Chen et al. reported that patients who contracted H7N9 (influenza A) experienced long-term lung disability and psychological impairment even two years post discharge [8]. Moreover, in the case of Severe Acute Respiratory Syndrome (SARS) which is another contagion in the coronavirus family, Lee et al. reported that at one-year post survival, individuals continued to experience elevated levels of stress, depression and anxiety [9]. They warned that "*the long term effects of infectious disease should not be ignored*". Likewise, Lam et al. [10], Lam et al. [11] and Fallah et al. [12] have highlighted that SARS survivors exhibited long term effects of SARS including limitation in physical function and weakness, which in turn impacted their occupational and social participation.

Similar findings have been reported when exploring the outcomes related to the Ebola Virus Disease (EVA). Jagadesh et al. reported that "*. . .a year following acute disease, sur-*

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vivors of the recent EVD outbreak have higher odds of persisting disability in mobility, vision, and cognition. Mental health issues such as anxiety and depression persist in EVD survivors and must not be neglected" [13]. Others such as Mattia et al. [14], Scott et al. [15], Tiffany et al. [16], Omoleke et al. [17], and Wendo [18] all report that negative ocular, musculoskeletal and neuropsychiatric outcomes are common within EVD, furthermore, many survivors experience difficulties in returning to work due to long-term consequences.

In our opinion, the peer review literature supports the notion that that survival from an infectious disease is only the first step, and that infectious disease can lead to long term impairment, activity limitation and participation restrictions. Given this growing body of evidence, we signal the need to more fully incorporate multidisciplinary rehabilitation teams inclusive of physiotherapy along the disease trajectory from acute and inpatient care, through to the ambulatory settings and onwards into the community.

Therefore, while there is a global focus on 'flattening the curve' by reducing the surge of new COVID19 cases, we propose a need to expand our collective "peripheral vision" and consider the magnitude and long term impact of physical, mental and emotional decline post survival. If we as a global society of practitioners are to minimize the long-term impact of COVID19, public health stakeholders need to develop a much wider and inclusive lens. To be effective, rehabilitative interventions must be considered during the planning and allocation of resources used to fight a disease outbreak. Otherwise, we will be playing, yet again, a tragic game of 'catch-up' in reducing disability-related outcomes of COVID19 [19].

Over the last decades the emergence of SARS, H1N1, Influenza A, and Middle Eastern Respiratory Syndrome (MERS) illustrates the powerful threat of cross-species transmission events that have led to novel human disease with consequential global impact. While COVID19 currently occupies global attention and resources, in reality, a litany of other potential zoonotic diseases continue to reside in animal reservoirs around the world and only time and circumstances will determine the emergence of the next global pandemic. It is prudent to not only react to current challenges, but also to anticipate future ones. We believe that '*What's past is prologue'*, and that COVID19 is a powerful reminder to the global physiotherapy community what it can contribute, but that it must equally be prepared to scale-up for a changing reality.

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