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Editorial

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Brain Health, One Health, and COVID-19

David O. Wiebers[a] Valery L. Feigin[b] Andrea S. Winkler[c, d]

[a]Emeritus Professor of Neurology and Consultant Emeritus in Neurology and Epidemiology, Mayo Clinic and Mayo Foundation, Rochester, MN, USA; [b]Professor of Neurology and Epidemiology, Director of the National Institute for Stroke and Applied Neurosciences, Auckland University of Technology, Auckland, New Zealand; [c]Specialist Neurologist and Co(joint)-Director of the Centre for Global Health, Department of Neurology, Technical University of Munich, Munich, Germany; [d]Professor of Global Health and Founding now Deputy Director of the Centre for Global Health, Institute of Health and Society, University of Oslo, Oslo, Norway

Brain health is fundamental to all health. Without brain health, there is no health. Healthy lifestyle choices and all other preventive approaches as well as taking medications and all other forms of treatment depend upon behavior and therefore are dependent upon the brain. All forms of brain impairment including cognitive, psychiatric, psychological, and other neurological impairments affect the overall health of the individual and dependent individuals around them. Without addressing brain issues, there can be no prospect of attaining optimal health.

The brain is the ultimate command and control center for one's nervous system and body. It is the most critical determinant of an individual's ability to function and do well in life as it enables all other mental and bodily functions. Without it, there can be no facilitation of consciousness nor the application of such to any element of this physical world. The brain is a tool that is fundamental to expressing and maintaining all of our physical, sensory, intellectual, emotional, behavioral, and social functions and interactions. Optimal brain health is therefore vital to ensuring the effectiveness, integrity, and safety of ourselves and those around us on both personal and planetary levels.

The COVID-19 crisis has thus far affected over 210 million people in 192 countries and regions, resulting in over 4.4 million deaths and substantial acute and subacute brain morbidity in many forms with the potential for producing long-term neurological impairment in a high percentage of survivors [1, 2]. The crisis has also provided us with another fundamental determinant of brain health and overall health – the interconnectedness of all life – other humans, nonhumans, and the earth. All that we do depends upon abundant plant and animal life as well as clean air and water, and what is good for nonhumans and the earth is virtually always in the best interests of humans, given the profound interdependence of all life. However, it seems that the recognition of this connectedness and interdependence has been lost in the ever-increasing quest for economic growth and overall wealth. Now seems the time to reconnect human, animal, and environmental health for the benefit of each one of them and for the planet at large.

The COVID-19 situation is the most recent example of how human behavior in connection with other life forms has brought about an alarming increase in zoonotic diseases in recent decades with the potential to rapidly cause massive amounts of acute and long-term brain impairment [3, 4]. It is not only the human encroachment on nonhuman animals but also our negative impact on the environment resulting in air, land, and water pollution and climate change in exchange for economic growth that adds significantly to neurological and psychiatric disease burdens. The emergence of novel and concerning COVID-19 variants on mink farms that can easily be transmitted to humans or other wild or domesticated animals raises the prospect that a global pandemic put in motion by exploiting animals in live-animal markets may be extended and reinvigorated by our exploitation of animals on mink farms [5, 6]. In this context, a One Health approach rooted in the premise that human, animal, and environmental health are inextricably linked becomes imperative to brain health. More specifically, the One Health concept highlights the synergistic benefit of closer cooperation and integration

karger@karger.com
www.karger.com/ned

Correspondence to:
David O. Wiebers, david@wiebers.co

among human, animal, and environmental health sciences and other disciplines, for example, social and political sciences, and their respective professionals, with end goals of improving health for all life forms and creating a perpetually habitable planet [7]. The approach involves consideration of several interrelated dimensions including shared environments among wildlife, farm animals, companion animals, and humans; shared medicines and interventions; and the production and safety of our various food systems. Although brain health and One Health have so far not been linked, such an approach is not only greatly beneficial for infectious diseases that affect the brain but also for non-communicable diseases such as cerebrovascular diseases, dementia, and other brain disorders. In fact, COVID-19 may act as an accelerator to bringing the brain health community together around global health and One Health issues. This idea has recently been taken up by the global COVID-19 Neuro Research Coalition, an inclusive and equitable research platform around neurological research questions in the context of COVID-19 [8].

As we begin to find our way through the COVID-19 crisis, it is vitally important for us as a medical community and as a species to reflect deeply upon what this and other related human health crises are telling us about our role in these increasingly frequent events and about what we can do to avoid them in the future [3, 9]. This includes discontinuing live-wildlife markets and factory farming, two activities that are among the most threatening to human health and among the most debasing to our species [9]. For the sake of humans, nonhumans, and the earth, there is a fundamental and urgent need for us to rapidly evolve toward eating forms of protein that are safer for humans, including a wide range of time-honored fundamental plant-derived food sources as well as the more recently developed plant-based meat, dairy and egg alternatives and cultured meat (produced by culturing animal cells) [9–12]. And we need to advance our governance structures so that they are neither rewarding activities that are destructive to the planet nor heavily prioritizing economic governance over health and environmental governance [9, 12]. We call on decision-makers to seriously think about making One Health the new norm across the various sectors while inventing and implementing equitable economic systems that have human, animal and environmental health at their cores. Our failure to heed the wake-up call of COVID-19 and rethink our relationship with all life on this planet will not only impact negatively on brain health but may ultimately result in the unwitting extermination of all or a good part of our species.

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