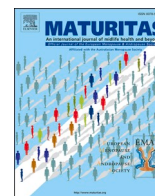




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Editorial

Accelerated ageing in the COVID-19 pandemic: A dilemma for healthy ageing



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Shifts in distributions of countries' populations towards older ages, population ageing, are occurring across the globe. Concurrently, accelerated ageing and age-related diseases are rising, with a wide range of effects on societies. In response to this, the World Health Organization, along with other stakeholders, aims to foster healthy ageing worldwide [1]. However, the ongoing coronavirus disease 2019 (COVID-19) pandemic has brought and brings several challenges for achieving healthy ageing, where: population ageing is an important driving factor, as the disease poses disproportionate threats to older adults and consequently places with more rapidly ageing populations are affected worse; accelerated ageing, independent of chronological age, is linked to COVID-19 severity; and COVID-19 is directly and indirectly (i.e., through social distancing, quarantine and lockdown measures, amongst others) creating barriers to healthy ageing, including limiting engagement in healthy lifestyles and behaviors and increasing social isolation. Collectively, these threaten societal healthy ageing goals. To achieve healthy ageing, especially during this and potential future pandemics, innovative public health research and research-based solutions are needed.

An under-appreciated aspect of the pandemic is the role of biological age and accelerated ageing in COVID-19 susceptibility, recovery, and post-recovery, as well as the secondary effects of pandemic mitigation practices on increases in accelerated ageing. Age-related trends in COVID-19, while partly explained by increased comorbidities, including dementia and type II diabetes, may very well be driven by increases in accelerated biological ageing, rather than chronological age [2]. Underscoring accelerated ageing are the roles of lifestyle, behavioural, and environmental factors, where a lack of physical activity, smoking, poor diet and excessive alcohol consumption are the most directly associated factors for many non-communicable diseases and contribute

to unhealthy and accelerated ageing and early mortality. Yet, systemic changes to much of life due to the COVID-19 pandemic have led to increases in these and other unhealthy lifestyle behaviors (e.g., declines in sleep quality, increases in screen time, and decreases in time spent outside). Furthermore, there has been an increase in daily stressors (e.g., work deadlines and family relations) and interpersonal stressors (e.g., social isolation and loneliness), which are associated with accelerated ageing and increased risks of cardiovascular and cerebrovascular diseases, cognitive decline, dementia, depression and disability, and a lack of engagement in healthy behaviors, leading to reduced life expectancy and quality of life [3]. It is noteworthy that lifestyles and behaviors are experienced differently across the age range, which may be amplified by differences in ageing-related COVID-19 measures, where, for example, senior citizens may be more susceptible to social isolation and loneliness, malnutrition, and decreases in physical activity, amongst others. Underscoring many of these factors are the unequal and profound effects that may be experienced across different societies and subgroups within societies, amplifying existing health inequities (e.g., structural and social drivers), and creating potential new health disparities (e.g., disparities in vaccination rates).

Despite knowing that lifestyle, behaviors, and the environment are collectively key factors in ageing and are being compromised and amplified by health inequities in the current pandemic, attention has been given to only one or a few of these (e.g., strong focus on the lack of physical activity) and comprehensive studies that assess the integration of multiple factors and their influences on ageing and ways to achieve healthy ageing within the context of the ongoing and potential reoccurring pandemics are lacking. For example, individual components of a healthy lifestyle, behaviors and positive environmental exposures may potentially lead to healthy ageing, such as diet (e.g., through caloric

Abbreviation: COVID-19, coronavirus disease 2019.

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restriction or nutrients that act as bioactives), physical activity (e.g., via decreases in blood pressure and in the improvement of metabolic function by an increase in muscle protein synthesis), sleep (e.g., increases in quality and duration of sleep), and the use of green spaces (e.g., via opportunities for physical activity, promotion of social interaction, and increases in vitamin D), among others. These may mitigate adverse mental and psychological pandemic-associated effects on ageing. Addressing these factors collectively would lead to a better understanding of their role in accelerated and biological ageing; aid in creating guided interventions on multiple levels for the mitigation of accelerated and biological ageing; and help in identifying biomarkers that prognostically inform potential increases in risks for or severity of COVID-19 disease progression in light of accelerated ageing.

At the same time, public health solutions for collective aspects of lifestyle and behaviors in achieving healthy ageing in view of COVID-19 measures are needed. Information and digital technologies have been the primary mode advocated for and targeted in public health campaigns to preserve healthy ageing. For example, the use of tools for social connection has been suggested, such as instant messaging software, videoconference, social media, telephone friendship service, and artificial intelligence companions to decrease social isolation; similarly, digital technologies for the delivery of services and care, such as cognitive behaviour therapies, mindfulness, meditation and physical exercises and instructions, and other health services provided via telehealth, such as nutritional guidance and mental health services have been promoted. Yet, there are some intrinsic drawbacks to digital intervention schemes that warrant attention. Notably, there are inequalities in the availability of or literacy in digital resources. Digital interventions may fail because of various barriers to technology, including limited or no access to the Internet or digital equipment, poor operational skills and/or impaired cognitive or physical abilities. Therefore, at a societal level, efforts are needed to conquer digital divides with available, affordable, and accessible services and equipment. Furthermore, an increase in the use of digital technologies may have unintended health consequences, including increases in sedentary behaviors and extensive screen time, and technology use may heighten attention-deficit symptoms, impair emotional and social intelligence, lead to technology addiction, social isolation, impaired brain development, and disrupted sleep [4], and decreases in engagement with green space and natural environments, amplified by containment measures in place owing to COVID-19 (where some people have interacted less with nature and others more). Thus, the benefits and consequences of digital technologies will need to be thoroughly assessed and, in the meantime, their use in achieving healthy ageing will need to be balanced with digital well-being approaches. Lastly, alternative or parallel models to achieve healthy ageing in pandemics need further study and support, including in-person engagement in social support and healthy lifestyles and behaviors through social distancing, use of outdoor spaces, implementation of effective filtration systems in indoor spaces, along with proper use of masks, frequent testing, and equal access to these aspects, amongst others.

While the COVID-19 pandemic has highlighted how unprepared we are in protecting ageing populations and in achieving healthy ageing, the dual challenge of achieving healthy ageing and living in a pandemic is an opportunity for researchers to collectively address drivers of accelerated ageing, rethink global ageing, assess multiple and collective ageing parameters across the life course to define key factors and periods that may foster longevity and improve quality of life, address health

disparities, and reimagine societies, systems, and efforts to achieve healthy ageing beyond current measures (e.g., simply advocating for the use of digital technologies). Such efforts will require interdisciplinary research and the involvement of several stakeholders to provide multidisciplinary and comprehensive efforts to alleviate and offset the impacts of the pandemic and to create a more ageing-friendly world.

Contributors

Xiaolei Guo contributed to the conception and drafting of the article.

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Jessica E Laine contributed to the conception and drafting of the article, and revision of the article critically for important intellectual content.

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