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Editorial

Covid-19 and Aging: Challenges and Opportunities

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Prior to the onset of the Covid-19 pandemic, I had the sense that the fields of Gerontology and Geriatrics were on the doorstep of a period of rapid advancement. Several important findings emerged in the basic biology of aging, major public and private investments were being made in geroscience and a landmark clinical trial (TAME) of an intervention to slow senescence was about to be launched. At the same time, at the other end of the spectrum, the concepts of successful aging of societies and opportunities to strengthen the social capital of older persons were attracting increased attention as there was increased recognition that advances in healthy life expectancy were stalling as morbidity appeared to no longer be compressing and perhaps even begun to decompress, especially among the most needy (1). As the U.S. National Academy of Medicine launched a Healthy Longevity Commission to study global challenges and opportunities, the World Health Organization initiated the ambitious "Decade of Healthy Ageing" program, a major government report in the United Kingdom called for a much more aggressive strategy to foster successful aging (2), and Singapore was preparing to begin its broadly scaled and pioneering age friendly Health District project. There were increased calls for "Age-Friendliness" of communities and health care systems and more emphasis on a life-course approach to planning for what inevitably seemed to be longer and longer lives including Carstensen's innovative "New Map of Life" project at Stanford (3).

All this collided with Covid-19. Very early in the course of the Covid-19 pandemic, it became glaringly clear that older persons were at significantly increased risk of infection, severe illness, hospitalization, intensive care and respiratory support, and death. The numbers were startling. Case fatality rates, which were low in children and young adults, rose from 3% to 5% from age 65–74 to 11% at ages 75–84 and as high as 27% over age 85. Older patients represented 45% of hospitalizations, occupied 53% of ICU beds, and accounted for 80% of deaths (4). The in-patient geriatric medicine services in Paris saw 31% mortality (5) and in a series of 2 772 consecutive elderly Covid-19 patients hospitalized in Spain, mortality neared 50% (6). Experience in the United States was no better. And it has not been surprising to note that where resources are more limited, such as in low- and middle-income countries, the experience has been even worse. In this regard, Professor Peter Lloyd Sherlock and his colleagues at the University of East Anglia have developed a Global Platform Reader on COVID-19 and Older People in Low and Middle Income Countries, which includes over 70 concise pieces covering a wide range of issues such as ageism, vaccination, elder-care workforce, and long-term care.

Residents of nursing homes are at special risk. By May 2020, 50% of U.S. Covid-19-related deaths had occurred in nursing homes, and it reached 70% in 4 states (7). To make matters worse, the omicron wave has induced critical staff shortages in long-term care facilities and the pipeline from hospitals to nursing homes is again clogged as empty, staffed nursing home beds are scarce. One factor driving this is the major "vaccine gap" between the relatively high vaccination rates in nursing home residents and the surprisingly low rates in staff. This disturbing, and treacherous disparity is the same for influenza vaccination (8).

The disproportionate risk of older persons reflects underlying biological, clinical, and social factors as well as exposing our dramatic lack of preparedness to protect vulnerable populations during a pandemic or epidemic. With respect to biology, age-related changes in the immune system are important contributors (9,10). This includes both a ramping up of inflammatory responses (inflamm-aging), which sets the stage for a systemic surge of inflammatory mediators—the so-called "cytokine storm"—which impairs functions of many organs, especially lungs as well as a ramping down of the effectiveness of the cellular arm of the immune system (immune-senescence) reducing the body's capacity to clear viruses directly by cells or via production of neutralizing antibodies. Clinical features include the very high prevalence of multiple morbidities in older persons especially those with attendant functional impairment and reduced cardiac, pulmonary, and renal reserve. This group experienced the greatest risk. And many of these frail, multiply-impaired patients reside in long-term care facilities where the social setting, with congregate meals, lack of personal protection for staff, and other factors dramatically increase the risk of infection.

Beyond the impacts of infection, restrictions associated with measures to mitigate community transmission, and generalized fear of interacting with others have disadvantaged older persons. Sedentary behaviors have increased and exercise reduced, stress, loneliness, and isolation have increased. Access to routine and even emergency health care is impaired, though some of this is mitigated by dramatically increased use of telemedicine. Nutritional challenges are emerging as individuals are wary of grocery shopping and have limited access to congregate community meal settings (11). Much research is needed in this area, especially regarding the long-term effects of pandemic-related stress and isolation on older persons, even if not infected.

Although there have been many proposals for strategies going forward as we exit the pandemic and seek to get back on our feet and regather momentum to advance geriatrics and gerontology, I would like to place special emphasis on 3 areas I feel are especially ripe for important, and I believe essential, progress:

Research on Immune Changes With Age and Age-Related Disorders

Considering the experience with Covid-19, what could be a more flagrant demonstration of the urgent need for research on immunology and aging?

Such an effort should span basic and applied studies, including vaccines and other therapies targeting the effects of aging as well as age-related disorders, including common diseases and syndromes such as frailty. Given the urgency, and global impact, a coordinated international program, perhaps led by a consortium of major foundations in collaboration with government-sponsored research entities, such as NIH, might be the best strategy. And recent scientific advances in the field, including promising evidence of the value of interventions based on rapamycin and its analogs, senolytic agents that cleanse tissues of toxic senescent cells, and the beneficial effects of NAD precursors and diet modulation provide a platform for short term advances (12). Senolytics are attracting special attention based on some early clinical trials in a variety of conditions (13) and the emerging research indicating a possible role for senescent cells in the adverse clinical susceptibility of older persons to Covid. Such findings have propelled the advancement of clinical trials of senolytic strategies in Covid-19 (14). The field is poised for success.

Ageism

One especially adverse effect of the pandemic on older persons relates to the fact that a particular form of ageism—generally referred to as "pandemic ageism" has emerged. This seems to have evolved from the disproportionate clinical severity of Covid-19 in older persons which has lead to its misrepresentation as a "geriatric disease," suggesting that prevention or treatment efforts in older persons are futile as death is predetermined and it is wiser to channel resources to younger groups who have more to benefit. In addition, there is a perverse blaming of the elderly adults for community transmission, which leads to severe isolation of older persons. There have been numerous instances in which access to health care services such as ICU beds or ventilators or even vaccinations have been denied or limited based on age, the presence of frailty or residence in nursing homes (United States). Such unacceptable biases may be internalized by the stigmatized older persons themselves who begin feeling as if they are a burden, further withdraw from society and refrain from seeking care for their physical or mental health needs. This feels like a combination of society blaming the victim while the victim's response becomes a self-fulfilling prophecy of a distorted reality (4,15,16). Clearly much research is needed on the long-term consequences of the pandemic experience on older persons even if they are not infected.

Although the immediate reaction of many is to assume that older persons would be more seriously adversely affected than their younger counterparts, some studies suggest otherwise. Building on the well-established literature describing more positive emotional experience in older persons, Carstensen showed that this age-related advantage persisted during Covid-19 (17). This finding was replicated by in 2 larger follow-up studies by Sun et al. (18), who demonstrated that although the age advantage persisted, it was somewhat diminished, which the authors saw as compatible with the theory that the age advantage reflects avoidance of negative circumstances by older persons, a strategy that becomes more difficult in a pandemic.

Covid-related exacerbation of prior ageist perceptions and practices is further complicated by the emergence of what the UN has referred to as a "shadow epidemic" of abuse and neglect. The pandemic has worsened traditional risk factors such as social isolation, cognitive impairment, and dependence on others, sparking an alarming rise in abuse of elders as well as women and children (19).

The world has neglected ageism for too long and further neglect of the issue is a risky strategy for aging societies. The WHO has been right to include elimination of age discrimination as a major thrust of the Decade of Healthy Ageing. In the spirit of "not wasting a crisis," perhaps the time has finally come to mobilize the needed forces, including public opinion and social policies to beat back ageism in all its forms.

Long-Term Care

Assessment of the dismal experience for older residents of nursing homes during the pandemic revealed several valuable lessons (19). Although it is obvious that most, if not all, nursing homes are not designed, staffed, operated, or funded to protect residents or staff during a pandemic, data emerged to suggest that the catastrophe might have been averted. A significant aspect of the disadvantage of older nursing home residents may reflect the systemic ageism discussed above and be reflected in policy decisions to steer personal protective garments and other supports preferentially to other portions of the health care sector, perhaps reflecting the view that elderly nursing home residents were a "lost cause" and not worth the investment.

But here again the news is not all bad and important lessons are being learned. Experience with clinically nursing home eligible patients in the PACE Program (Program for All Inclusive Care of the Elderly) in which interdisciplinary teams care for over 55 000 home-bound frail patients nationally, experienced very few COVID cases. And similar very positive experiences were reported in a group of several nursing homes in France (20) and a couple in the United States, that went to extreme measures to separate the nursing home and its staff from the community, effectively creating an isolated environment. This approach was informed by many experiences, including the findings that many nursing home staff worked in multiple long-term care sites, thus transmitting the virus from one

facility to another. Informed by early experiences, awareness of the critical importance of social and clinical factors and adherence to safe practices of some states, notably Massachusetts, developed effective state-based efforts to control nursing home infection rates (21,22).

In a very positive and helpful development, the World Health Organization has assembled a Global Network of experts in this area and has developed and promulgated guideless for the use of individuals, facilities, and programs.

Going forward, I see 4 key areas for focus in long-term care:

First, we must prepare for a major surge in the demand for home care services as well as PACE and PACE-like programs. Patients and their families are very hesitant regarding nursing homes and are likely to remain so for some time

Second, it is essential to recognize that the very specific and distinct subsets of nursing home residents might be better served in smaller facilities, which turned out to be safer, and that might have a more single-purpose strategy (23). These subsets include the acute rehabilitation patients who are in long-term care following surgery, an injury or a stroke; the palliative care population who have serious persistent illness many of whom are at the end of life, and the cognitively impaired populations best managed in "memory care" facilities. Such "unpacking" of the nursing home population going forward could result in better and safer care. In particular, the rehabilitation subset might be managed in facilities in or adjacent to the acute care hospital where their initial treatment was provided, as was often the case decades ago and persists in some medical centers and which facilitates access to patients by their providers.

Third, we need an intensive focus on recruiting and training long-term care staff. A well-funded dedicated program should provide them with protection (vaccination as well as personal protective equipment [PPE]), the knowledge and psychological support they need to care for patients and themselves during a pandemic and the financial support and career advancements opportunities needed to make these jobs more attractive.

Lastly, we must address the serious adverse effects of isolation on patients and their families, which include dramatic increases in anxiety and depression. Recent evidence indicates the critically important role of family caregivers for not only home care patients but also those in nursing homes. Strategies might include enhancement of capacity for televisits with family and care givers and rapid deployment of recently developed mobile technologies that can connect patients, informal care givers and the health care team to help organize and streamline communications and care as well as play a valuable role in training and coaching.

We have failed older persons during the pandemic. Our lack of preparedness to protect them ranged from inadequate understanding of the dynamics of the aging immune system to the inability to provide safe long-term care. Hopefully, we have learned some lessons, however bitter, and can marshal the resources and political and societal commitment needed to prevent repetition of this tragedy in the future.

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Conflict of Interest

None declared.

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