

Understanding Health and Social Challenges for Aging and Long-Term Care in China

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Abstract

The second King's College London Symposium on Ageing and Long-term Care in China was convened from 4 to 5th July 2019 at King's College London in London. The aim of the Symposium was to have a better understanding of health and social challenges for aging and long-term care in China. This symposium draws research insights from a wide range of disciplines, including economics, public policy, demography, gerontology, public health and sociology. A total of 20 participants from eight countries, seek to identify the key issues and research priorities in the area of aging and long-term care in China. The results published here are a synthesis of the top four research areas that represent the perspectives from some of the leading researchers in the field.

Keywords

healthy aging, long-term care, China

Population aging has created an unprecedented global challenge: the number of older people (aged 65 and above) is expected to grow from 1 in 11 people in 2019 (9%) to 1 in 6 (16%) in 2050 (United Nations, 2019), with most of the increase taking place in low- and middle-income countries (World Health Organization, 2015). In China, the total number of older people reached approximately 176 million, or 13% of the entire population in 2019. The proportion of older people is projected to increase to 26% by 2050, exceeding that of most European countries. As people age, it is expected that they will develop a higher propensity to suffer from various illness and chronic conditions. Aging is a lifelong process. Scholars to date have identified various risk factors relating to health outcomes in later life, and suggest that taking a life course perspective to look for causes of various health conditions and illness will provide valuable insights into healthy aging. Healthy aging will reduce the financial burden of care and delay the use of long-term care (LTC), which involves a variety of services/activities designed to meet a person's health or personal care needs and to help them live as independently and safely as possible when they can no longer perform everyday activities on their own (World Health Organization, 2015). Currently, most older people will need to use LTC at some point of their life. Informal care has been the primary source of care for disabled older people, but reliance on family provision has become untenable due to changing demographic structures and rapid socio-economic shifts in many aging countries, including China. This not only implies that a formal care system is needed, but also

means that the government should carefully design its LTC system to ensure equity in access and financing among the older population. Attention should also be paid to technological advancement which can play an important role in developing

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innovative care delivery models. Today, technologies in gerontology and geriatrics that are powered by Artificial Intelligence (AI), the Internet, sensors and actuators have already been developed to help meet care needs, and these technologies can be useful in their capacities to support older people and caregivers in care provisions. Facing a significant increase of LTC demands but with limited resources, it is particularly important to use technology to develop innovative care delivery models in China and other developing countries.

The second Symposium on Ageing and Long-term Care in China was convened from 4 to 5 July 2019 to discuss these topics. While the first symposium focused on key drivers for population aging, such as increased life expectancy and low fertility, the second symposium drew research insights from a wider range of topics related to LTC policies and systems. A total of 20 leading researchers and scientists from eight countries, sought to identify key issues and research priorities in the area of aging and LTC in China. International lessons were also discussed in the symposium. The participants discussed these four priority research areas:

1. Understanding healthy aging from a life course perspective: How do risk factors from early life onward affect health outcomes in later life?
2. Improving care provision: How do long-term care and health care utilization vary among older people, and what are the potential access barriers?
3. Addressing issues in LTC financing: How is the LTC sector financed, and what problems do we see in terms of the current LTC financing model?
4. Promoting technology and innovation in LTC: What roles do technology and innovation play in LTC provision?

Understanding Healthy Aging From a Life Course Perspective

Health inequality and disparities in old age can be substantial due to multiple environmental, behavioral and social circumstances that affect individuals' life trajectories. A large and growing body of research has suggested that *in utero* and childhood risk factors may contribute to health in later life. These risk factors, including poor health in childhood (Gong et al., 2015; Kendig et al., 2017; Wang & Shen, 2016; Wang et al., 2018a), limited access to healthcare (Zeng et al., 2007), low parental socioeconomic status (Zhang & Crimmins, 2018), childhood adversities (Tian et al., 2019; Yang & Lou, 2016), low residential mobility (Xu et al., 2019), malnutrition (Zhang et al., 2018a), lack of social support (Zhang et al., 2018), low education and cognitive stimulation (Langa & Larson, 2014), unfavorable sibling sex-composition such as daughters growing up in families with sons (Huang & Elo, 2009), and negative parent-child relationship (Zhang et al., 2018), have been found to contribute to individuals' susceptibility to mental health problems, chronic diseases, functional and cognitive impairment, and premature death in China. The association between

mid-life lifestyle factors and late-life physical and mental health status has also been established (Lafortune et al., 2016; Sun et al., 2009; Tyas et al., 2003). Lifestyle factors, such as smoking (Tyas et al., 2003) and the transition into spousal caregiving (H. Liu & Lou, 2019) are found to be significantly associated with health in older age for Chinese population. Higher smoking intensity was also associated with higher risks of Alzheimer's disease (Tyas et al., 2003). Other risk factors, such as regional and rural/urban status at birth (Yan et al., 2020), exposure to famine (Sun et al., 2018), low educational attainment and poor neighborhood quality (Li et al., 2020) and migration (Xu et al., 2017), also increase the risk of worse health in later life in China.

Evidence from the developed world has drawn attention to the relationship between life course events and old age health, but limited research has been done in the context of China. A number of researchers have looked into how historical events happened in China, such as famine and war, may affect population health. For instance, a few studies compared cohorts who were exposed to *the Great Chinese famine*¹ from 1959 to 1961 with those who were not directly exposed, and found that *the Great Chinese Famine* had negative effects on height, weight, educational attainment and labor supply (Sun et al., 2018; Wang et al., 2015, Wang et al., 2016a; Wang et al., 2016; Wang et al., 2017). Researchers have also attributed reductions in mortality and morbidities early in the People's Republic to evolving healthcare system including the now obsolete barefoot doctor scheme (Blumenthal & Hsiao, 2015). However, evidence on the longitudinal relationship between individual's lifestyle in early- and mid-life and health outcomes in the context of China is rather limited, with exceptions of several qualitative studies that have examined how historical contexts and social changes could affect people's perceptions and choices and thus health in the life course (Liang & Luo, 2012, 2017). Although studies from the U.S. and Singapore showed that lifestyle interventions demonstrated positive effects on reducing the development of diabetes and diabetes-associated microvascular complications in later life (Sathish, 2019), evaluations on similar interventions were rather limited in China. The Chinese government has adopted chronic disease prevention programs in the spirit of *Health in All Policies* and stressed the role of communities in healthy aging (Ministry of Health, 2010; Shen, 2014; Yang et al., 2008). China's Non-communicable Disease Prevention Demonstration Area Project² has been shown to improve disease management and reduce unhealthy diet and smoking in the short-term, but its long-term impact on health and demand for LTC requires a systematic evaluation (Jiang et al., 2018a).

Improving Care Provision

Providing access to affordable care for all people in need is one of the most important goals for an LTC system. The most common form of care for older people is informal, provided by families and friends without remuneration (Bloom et al., 2015). In Europe, it is estimated that between 20% to 44% of the LTC is provided by informal caregivers (Jang et al., 2012;

Jegermalm & Grassman, 2012; Sole-Auro & Crimmins, 2014; Verbakel et al., 2017). Similar trends are observed in Hong Kong, Japan, Singapore, and South Korea (Census and Statistics Department, 2009; Jang et al., 2012). In terms of formal care, most high-income countries provide some degrees of institutional care for older people with limited informal support and/or a high degree of dependency. However, over the past few decades, the public institutional care system has gradually evolved into home- and community-based care. Recent data show that only 2 to 5 percent of the population aged 65 and above are institutionalized in Australia, Japan, Sweden, US, and Italy (Gori et al., 2015).

Although LTC provision in China has been largely reliant on family care, the availability of informal care is of particular concern in the context of population aging due to low fertility (Yang & Tan, 2019), a distorted gender ratio (Ebenstein & Sharygin, 2009) and substantial internal migration (Giles et al., 2010). Older people from low income groups and with migrant children who live far away from them may be unable to receive informal care and are more likely to require publicly funded care. In order to help older people to live interdependently, it is crucial to understand what types of care services are needed, as well as factors that contribute to people's transition into institutional care facilities. It is also important to understand how caregiving may impact informal caregivers in terms of physical and mental health (Li et al., 2019; Liu et al., 2017a; Lu et al., 2017), social support (Jiang et al., 2018) and financial status. We have seen some evidence from the international literature, but evidence from China remains scant.

Institutional care has developed rapidly during the past decade. There has been approximately 70% growth in the number of care home beds (6.7 million), reaching the target of 30 beds per 1000 older people (Luo & Zhan, 2018). In addition, a wide range of care facilities from board-and-care facilities to modern nursing homes with skilled carers, nurses, doctors and medical services have emerged (Feng et al., 2012). Some local governments have made significant progress in providing home- and community-based services, including purchasing services from grassroots social organizations, building day care centers, and providing meals on wheels services (Du, 2015; Yang, 2014; Yang, 2014). Initiatives have been developed to monitor, inspect and regulate care providers. A number of cities, such as Beijing and Shanghai, have published guidance to promote training for care providers (Du, 2015). Governments have also issued new policies regarding professional development of care workers, including lowering the thresholds for entering the sector, strengthening professional development as well as detailing career paths for care workers. However, compared to developed countries, formal care in China is under-developed, especially in the vast rural areas, where access to and quality of LTC remain limited (Du, 2015; Wu et al., 2009; Yang, 2016).

Access to geriatric care has been improved over the years due to the launch of a national level Social Health Insurance (SHI) system in the late 1990s. In the past decade, the Chinese government has made progress in developing its geriatric

departments (Dong et al., 2018). In 2016, the National Health and Family Planning Commission (NHFPC) established a national centre on geriatric, stressing the importance of geriatric in China. The NHFPC then issued a policy, which requires all tertiary public hospitals to have a geriatric clinical program. In 2017, the Ministry of Science and Technology funded six research centers for geriatric (Li et al., 2018). In addition, some local governments have taken measures to support the development of geriatric care. For example, the Jiangsu provincial government provides financial incentives for geriatric nursing staff who have worked for more than five years, and the Nanjing municipal government subsidizes geriatric services at day care centers in the communities (Li et al., 2018). At the primary care level, the government has also developed measures to strengthen the capacity of its primary care sector and provide geriatric training to primary care staff (Liu et al., 2017). However, China is still lagging behind in terms of trainings in geriatrics. Limited specialized geriatric training is offered in medical schools, and no geriatric qualifications are offered at the national level (Flaherty et al., 2007; Leng et al., 2008).

Another key challenge for the researchers and policy makers is to address the divided health and LTC service provision. How to bring different stakeholders on board to make efficient use of resources and deliver accessible and integrated services, and how to regulate and monitor the service providers to deliver quality and affordable care for older people is another research area which needs further investigation.

Addressing Issues in Long-Term Care Financing

Improving LTC coverage and financial protection for older people is an essential component in ensuring equitable access to LTC for older people. LTC services are often needed for an extended period of time, as many disabled people or people with a debilitating illness need services until the end of life. The lifetime costs for LTC can be prohibitive, therefore, it is important to improve state support for those with the greatest LTC needs and with the least ability (Rhee et al., 2015; Tamiya et al., 2011).

China's LTC financing is a mixed system which mirrors institutional and historical developments of the health and social care system, and recent development made by the government. Since the 1990s, the financial base of the LTC institutions has shifted from reliance on public funding to more diversified revenue sources, including self-payers. Older people are expected to pay out of pocket for care provided in government-run LTC facilities. For specialized nursing homes, costs are usually high, and often considered too expensive for self-payers to afford. The 2000s marked a significant break with previous decades in which the Chinese government's attention was predominately occupied by economic development. In 2006, the State Council issued series policy initiatives that have sought to develop a system of services for older people (The State Council of P.R. China, 2006). In particular, a 2006 State Council Policy document on the Development of the LTC sector outlined the guiding principle of building an

equitable, affordable and regulated LTC financing and provision system. Nationally, institutional LTC services are largely financed through public funding (i.e., government revenue and welfare lottery schemes). The central government required local governments to secure sufficient funds for LTC care. It is also stipulated that at least half of the surplus earned by the welfare lottery schemes must be earmarked for the LTC system (The State Council of P.R. China, 2011, The State Council of P.R. China, 2013). Although services are subsidized by the government, many complain that associated care costs are often too high. In 2005, nearly 60% of older people (about 3.5 million) did not seek care when needed, and this number is predicted to increase to 16 million by 2050 (Gu & Vlosky, 2008).

In the 2010s, the Chinese government started to look for new models to finance LTC services. A public LTC insurance has been piloted to improve access to LTC in fifteen cities. The LTC insurance is a dedicated funding mechanism which can be used to reimburse part of the LTC costs for disabled people. The goals of the LTC insurance are to improve equitable access to LTC and reduce financial burden of the older people. In 2012, Qingdao was the first city to officially initiate an urban LTC insurance scheme (Yang et al., 2016), and around 3.7 million people participated in the scheme in 2014 (Du, 2015). In 2016, the scheme was expanded to fifteen cities with growing aging populations. While the insurance design varies significantly across these pilot cities (Q. Wang et al., 2018), the revenue of the LTC insurance comes primarily from SHI. Approximately 74% of funds are drawn from the SHI, only 14% from specific premiums from individual contributions. Therefore, it is unclear whether the current funding mechanism will be sustainable in the future (Wu et al., 2018; Yang & Du, 2018). Within the pilot cities, the LTC insurance varies significantly, in terms of eligibility, covered services, reimbursement level, etc. Most cities only cover people with formal employment, or have implemented a less comprehensive package for those who are unemployed or from rural areas. For instance, in cities, like Anqing, Chengde, Chengdu, Chongqing, Qiqihar, and Guangzhou, only urban residents with formal employment can participate in the scheme. In Ningbo and Changchun, institutional care is covered but not home- and community-based care. In Jingmen, Shihezi, Nantong, Qingdao, Shanghai, Suzhou, and Shangrao, the benefit package is comprehensive and covers more population and a wide range of services. Covered target populations include both urban and rural residents, and both institutional care and community-based care is covered (Wu et al., 2018; Zhu & Österle, 2019).

China's LTC insurance differs from the ones implemented in other countries in terms of revenue collection and covered services. The current pilot LTC insurance scheme in China rarely requires a separate premium and draws its funds primarily from SHI. This is not the case in Germany, the Netherland and Japan, where working age adults are expected to make individual contributions through monthly or annual premiums to its LTC insurance fund. Further, the LTC insurance in some cities, for example Qingdao, focuses on nursing care services

instead of services designed to help older people with disabilities to perform daily activities.

Early assessments of the pilot LTC insurance have yielded mixed results regarding the impacts (Qin et al., 2014; Zhao, 2015). Some studies found that the scheme has made services more affordable for participants (Deng & Guo, 2015), and has generated substantial savings for hospital care (Lv & Wu, 2016). However, other studies reported discrepancies in reimbursement rates of services for participants with different SHI status (An et al., 2017) and poor coverage of older people with cognitive impairments (Yang et al., 2017; W. Zhang, 2017). As the LTC insurance is still in the pilot stage, systematic evaluations and analyses are needed to understand the eligibility of services, levels of coverage, benefit package, and purchasing mechanisms in order to inform the insurance design in the longer term (Du, 2015; Yang et al., 2018).

Promoting Technology and Innovation in LTC

Technology can be an innovative approach to serve the aging population. Assistive technologies such as wearable devices and smart home technology are able to facilitate caregiving and improve quality of life for older people (Chen et al., 2019). Technology that incorporates AI features and robotics can be harnessed as a part of the solution for LTC. For example, Japan, a super-aged country, has long been a forerunner in the adoption of technology in LTC (Siripala, 2018). AI is also fueling the development of precision medicine which is powered by machine learning approaches that are able to generate large numbers of quantitative biomarkers, synthetic molecular and patient data (Zhavoronkov et al., 2019). The advancement in technology may also have the potential to facilitate quality LTC at a relatively low cost (American Geriatrics Society, 2016; J. Wang et al., 2019). In China, AI is expected to revolutionize the healthcare and LTC industries by ushering in up to \$147 billion of health investment in the next 20 years. AI solutions, such as speech recognition, image recognition, natural language processing, data mining and robotics, can facilitate medical decision-making, advance the accuracy of medical diagnosis and streamline medical record-keeping (Kong et al., 2019). It may also help improve health equity by better redistributing medical resources across the country. AI can also help researchers and clinicians better use electronic health records (Kong et al., 2019).

In China, technology has been used in several ways to facilitate care and assist older people's daily living. For instance, the expansion of the Internet Hospitals demonstrated positive effects in terms of improving access to care in rural areas (Tu et al., 2015). The use of mobile health to monitor/treat health conditions has also become common among older people, and evidence show that these technologies are effective in areas such as blood pressure monitoring, cognitive therapy, fall prevention, etc (Sun et al., 2016). Furthermore, the internet of things has been incorporated into smart home systems to facilitate LTC through the installation of sensors in wearables to detect falls, record motions, and monitor the sleep quality of

older people at home (Lei et al., 2019; Wei, 2019). Nevertheless, the deployment of these technologies ought to be implemented with caution as technology is not a panacea for LTC. We believe that it is important to understand how to target the appropriate beneficiaries and ensure that technologies are accessible to older people who need them. There is also a lack of regulation on the use of technologies in LTC in China and many other countries, like European countries. It is important to develop clear guidelines and regulations on how to best govern the implementation of technology to improve the quality of care for older people.

Conclusions

This article presents four key issues regarding the health and social challenges of aging in China. It is essential for researchers to engage in multidisciplinary research collaborations to understand how to achieve an efficient and equitable LTC system in China. Lessons from high-income countries, such as the U.S., Germany, Japan and South Korea, in terms of understanding risk factors for functional and cognitive impairment, LTC service planning, financing and the application of technology in LTC, would be valuable for China. These top four research areas are proposed as key areas that could pave the way to many important inquiries, discussion, and future research priorities to examine challenging issues surrounding aging and LTC development in China as well as other low- and middle-income countries.

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Notes

1. The Great Chinese Famine was a period in the People's Republic of China between the years 1959 and 1961 characterized by widespread famine.
2. Noncommunicable Disease Prevention Demonstration Area Project was launched from 2010, with the aim of preventing and controlling non-communicable diseases in the People's Republic of China.

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