Longitudinal survey and interdisciplinary research on healthy aging

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The collection of papers in this special issue of *China Population and Development Studies* includes a review on Chinese Longitudinal Healthy Longevity Survey (CLHLS) and four reports on preliminary findings from the 8th wave of CLHLS conducted in 2017–2018.

Population of China, which is the largest developing country with 1.4 billion people in total in 2019, is aging rapidly due to rapid declines in both fertility and mortality. Under the medium or low mortality assumptions, the total number of elderly aged 65+ in China is estimated to increase dramatically from 176 million in 2019 (12.6% of the total population) to 337–400 million in 2050 (23.9% to 26.9% of the total population); the number of oldest-old aged 80+ who most likely need daily life assistance will climb extraordinarily to about 107–150 million in 2050. Because the Chinese “baby boomers,” who were born in the 1950s and 1960s, will fall into the category of the “oldest-old” after 2030, the average annual rate of increase of the oldest-old from 2000 to 2050 is about 4.4~5.1 percent in China, more than twice that of the industrialized countries. The much more dramatic increase of the oldest-old in China and other developing and developed countries deserves serious attentions and research, because the oldest-old consume services and medical care at a much higher rate than the young-old (Torrey 1992).

The unavoidable worldwide rapid aging trends raised fundamental research questions: whether the rapid population aging will be accompanied by disability expansion (Gruenberg 1977), or morbidity compression (Fries 1980), or dynamic equilibrium (Manton 1982)? Why do some people survive to advanced ages with good health while others suffer severe disability and diseases? What and how to keep the aging societies healthy? More specifically, what are the factors which may affect old

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adults' health status and the process of population healthy aging? What kind of policy reactions and program interventions need to be taken to respond to the serious challenges of population aging? Adequately addressing these questions will improve quality of life not only for the elderly but for all members of the society, but so far, there are limited answers to these important questions.

To address the important questions outlined above through discovering the social, behavioral, environmental, and genetic factors and their interactions that may influence healthy longevity, as well as providing data for academic research, and information for healthy aging policy analyses, the baseline survey of CLHLS was conducted in 1998 and the follow-up surveys (with newly recruited participants to replace deceased ones) were conducted in 2000, 2002, 2005, 2008–2009, 2011–2012, 2014 and 2017–2018 in randomly selected about half of the counties and city districts of 23 out of 31 Chinese provinces (Liaoning, Jilin, Heilongjiang, Hebei, Beijing, Tianjin, Shanxi, Shaanxi, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Henan, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Chongqing, Hainan). The survey areas covered about 85 percent of the total population of China. Data collections have been coordinated by the Center for Healthy Aging and Development Studies of National School of Development at Peking University, and the survey field works were carried out by the nationwide survey/health service networks by Chinese Center for Scientific Research on Aging for the 1st, 2nd, 3rd and 4th waves in 1998–2005, and by China Center for Diseases Control and Prevention for the 5th, 6th, 7th and 8th waves in 2008–2018. The survey field works of the 9th wave in 2020–2021 will be carried out by the nationwide survey/health service networks by China Population and Development Research Center for the nationwide surveys and by National Institute of Environmental Health of China CDC for the in-depth study sites of the 8 longevity areas.

In the 8 waves of the CLHLS conducted in 1998–2018, we have conducted face-to-face home-based 113 thousands interviews, including 19.5 thousand centenarians, 26.8 thousands nonagenarians, 29.7 thousands octogenarians, 25.5 thousands younger elders aged 65–79, and 11.3 thousands middle-age adults aged 35–64. Data on mortality and relatively detailed information of health status and care needs/costs before dying for the 28.9 thousands elders aged 65–110 who died between waves were collected in interviews with a close family member of the deceased. Note that slightly more than two-thirds of CLHLS interviewees were oldest-old aged 80+, because much more dramatic increase of the oldest-old who are more likely need services and medical care than the young-old aged 65–79, as discussed earlier. In the 8 waves of the CLHLS, we have collected DNA (blood or saliva) samples from 40.8 thousands participants for interdisciplinary research between natural and social scientists. All of the interviews, basic health exams and DNA samples collections are voluntary with standard consensus forms reviewed/signed by the participants (or their direct family members).

The CLHLS data has been made publically accessible for academic and policy researches. The extensive information collected by CLHLS and more than 20 years of follow-up enable in-depth analyses and interdisciplinary studies on healthy ageing and possible effective interventions. As of October 15, 2019 according to incomplete statistics, there are 7658 registered CLHLS data users (excluding their

students and other group members), and they produced many publications using the CLHLS datasets: 333 papers written in English, published in U.S. or European peer-reviewed journals; 11 books (five in English and six in Chinese); 443 papers written and published in peer-reviewed Chinese journals; 34 Ph.D. dissertations successfully defended at Universities inside and outside of China; 88 M.A. theses successfully defended at Universities inside and outside of China.

The five papers in this collection provide a snapshot of the CLHLS 8th wave conducted in 2017–2018. The first paper by Zhenzhen Zheng reviewed sampling design and questionnaire design of CLHLS and substantial extensions of data collection, especially about elderly cognition and mental health, and summarizes publications using the CLHLS data. The paper by Wang and He reports individual characteristics of respondents in the 8th wave survey, such as marital status, children ever born, educational achievement, and main source of income. Living arrangement and living preference of elderly are introduced in this report, although most of elderly people lived with families, the preference to live alone or only with their spouse increased with age. The report also describes housing condition of the elderly people, such as house ownership and conditions of the house. The paper by Ting Feng provides a profile on health status and care demand of elderly people, while more than half of the medical expenses covered by medical insurance, the major care provider of the elderly people were still their family members. The paper of Bai and Lei reports cognitive function and mental health of elderly people, and find that respondents who are better educated, married, without ADL limitation and regularly participating in exercise or cultural activities tend to have better cognitive function and mental health. The final report by Cuicui Xia reveals gaps between demand and availability of community-based service for elderly residents, as well as difference in availability among different sub-groups, with less satisfactory service availability to elderly lived in rural area and western areas with low income, indicating a big challenge in meeting the community-based service needs of elderly people.

The micro datasets of the CLHLS 8th wave is scheduled to be released for research community to use free of charge in the middle of Feb. 2020, and more intensive, interdisciplinary and multi-dimensional researches on healthy ageing using the datasets of 8th wave and previous waves of CLHLS are expected to be carried out.

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