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COMMENTARY

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The determinants of longevity: The perspectives from East Asian economies

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Home to approximately one-fifth of the world's population,[1] the East Asian region has recently been brought to attention in the public health and social sciences literature regarding its successes in health outcomes in comparison to other settings. In the late 20th century this region of the world has shown vast improvement in life expectancy (LE) and infant mortality rates—to standards that were comparable to the western developed counterparts. A notable example in this region is Hong Kong, which in 2010 has overtaken Japan to have the world's longest LE. A male baby who was born in Hong Kong in 2020 could be expected to live on average to age 83.4 years, while that for a female is 87.7. There has thus been sustained interests in the search of an "Asian model" in the hope that such feat could be replicated in other settings.

Patterns of mortality have been extensively investigated by previous studies, mainly stemming from the disadvantage of longevity and mortality of the United States when compared internationally.[2] Although relevant research in Asia is relatively limited, two observations apparently could explain the Asian advantage. First, mortality in young age was drastically reduced in the latter half of the 20th century. During this period, burgeoning public health infrastructure and medical advancement has helped prevent deaths from infectious diseases at very young ages, boosting the LE. The infant mortality rates (IMR) of the East Asia region now become the world's lowest—the IMR for Hong Kong in 2018 was 1.5 deaths per 1000 live births, while it was 1.9 and 2.1 respectively for Japan and Singapore, whereas the United Kingdom and the United States stood respectively at 3.9 and 5.7. Paradoxically perhaps, Japan and Singapore had relatively high prevalence of low birth weight, which is closely related to higher risk of infant and child mortality.[3] Despite such trend could not be fully explained by secular trend of gestational age, maternal smoking and BMI, this could reflect that pathways linking low birth weight and infant or early deaths could have been mitigated by medical resources and social factors.[4] Second, the reduction of deaths from chronic diseases at older age helped increase LEs since the 1960s. Given 94%–96% of new-borns in high-income countries could survive to and beyond age 50, variations in LE at birth is largely dominated by what happens over age 50 and the extent to which cardiovascular mortality is controlled.[5,6] Ni and colleagues recently reported that the lead contributor to Hong Kong's survival advantage is the

lower mortality from cardiovascular diseases in males and females, possibly due to low smoking prevalence.[7] Mortality from ischemic heart disease in Japan has never reached levels seen in western high-income countries.[8] Taiwan and South Korea also maintained a relatively low prevalence of hypertension.[9]

Dahlgren and Whitehead posited that factors that determine population health could be conceptualized as stacked layers from individual to the macro environment.[10] In addition to constitutional factors such as age, sex or genetics, access and quality of medical care are often assumed to be a primary determinant of health. But even health care does play a role, decades of research showed that with as vast spending on health care as the United States, the health dividend is not always proportionate.[11] The unique characteristics of the East Asian setting in terms of factors at the macro and meso level are potentially important explanations. We name a few examples here, each of which could be a hypothesis on its own leading to more comprehensive investigation.

Diets have long been proposed to result in the health differences between east and west. Soy and soy products are regularly consumed in the East Asia; previous evidence suggested that soy products might be protective against cancers and other chronic diseases.[12] Diets in the high-income East Asian region also feature exceptionally high intake of omega-3 fatty acids, vegetables, whole grains and low intake of sugar-sweetened beverages compared to other regions of the world; and it has the lowest rate of dietary-related cardiovascular diseases.[13] However, as of recently such dietary habit has been increasingly changing to a more westernized style to become lower in fiber content but higher in fat and carbohydrates.[14] Insufficient physical activities in high-income Asia Pacific economies has also been on the similar level of the west in the last decade.[15] These observations synchronized with the rising trend of obesity in the developed East Asian economies, which could have implications for LE in the future.

Regarding the more upstream factors, the social policies in the Asian economies traditionally feature low public expenditure on social welfare and a productivistic model that focuses on economic growth. The redistribution effects due to taxation and social insurance premiums are relatively low.[16] Family and community networks play central roles in providing care and safety nets for those in need, possibly a reflection of Confucianism.[17] Moreover, women empowerment in East Asia has

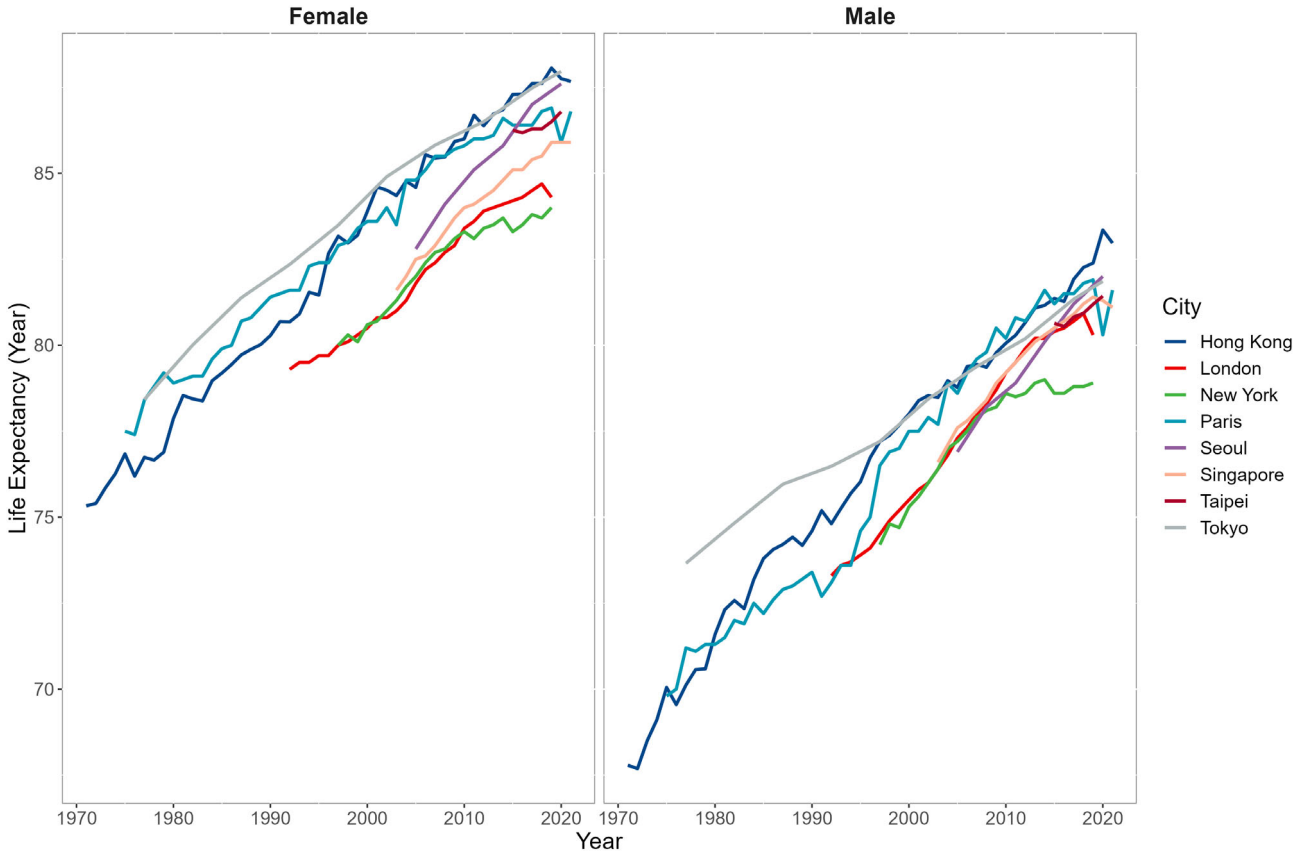

FIGURE 1 Life expectancies in selected cities stratified by sex. Data of London were the rolling average of every 2 years from year 1991 onwards and data for Tokyo was in non-overlapping 5-year groups from year 1975 (i.e., 1975–1979, 1980–1984) onwards.

long been relatively weak. According to a recent gender equality report published by the World Economic Forum, Japan and Korea respectively ranked 121 and 108 out of 153 nations surveyed.[18] Intriguingly, Japanese and Korean women defied conventional sociological theories by having among the world's longest LEs. Workers in the East Asian economies have also been traditionally working longer hours than in the West. Nonetheless, longer working hours have recently been shown by the World Health Organization (WHO) to be related to higher risks of heart disease and stroke.[19] It is perhaps a conundrum as to how the underlying social forces in the East Asian societies could mitigate these health risks. One of such possibilities could be the high urbanicity of the region, implying that urban dwellers could easily get access to essential utilities and medical services easily. However, when compared similarly highly urbanized cities in the East Asian region and the western counterparts, the advantage in longevity remains, suggesting that other factors could well be at play (Figure 1). Spectacular economic development from the 1960s without massive increases in income inequalities, or termed "shared prosperity" by the World Bank, was also proposed to play a role in health improvements particularly for those socioeconomically disadvantaged.[20]

Moreover, a more salient concern for public health policies is whether the extent to which the lengthening of LE is keeping pace with improving quality of life during older ages. In 2020, the WHO and the United Nation member states adopted the Decade of Healthy Ageing (2021–2030) resolution, targeting to implement collaborative actions to ensure that all older people could live long and healthy lives.[21] Central to this initiative is the concept that "healthy aging" is more than just absence of diseases, but to build and maintain the abilities of older people to be or to do things they have reason to value. A related measure in this regard is the healthy life expectancy (HLE), which measures the number of years expected to be in good health. While it is useful as a standalone measure of population health, the changes in the HLE/LE ratio over time reflects expansion or compression of morbidity toward older ages and hence the changes in long-term care needs following the added years to life. According the to the WHO global health observatory, Japan, Singapore, and South Korea topped the HLE league table in 2019 (Appendix S1), suggesting that the factors driving the secular trend of increasing LE might as well influenced HLE. However, as we see from the HLE/LE ratio, the share of years of life spent in good health in the East Asia remain fairly similar to the developed west. Data collection of HLE has not been systematic and underdeveloped in some places, making it difficult to monitor the status of healthy aging across time and space. Studies of determinants of HLE are also surprisingly limited comparing with that of LE.

The studies of mortality have become increasingly relevant because, in addition to social and cultural values, different forces of globalization, such as the recent Covid-19 pandemic, warfare, geopolitics and trade agreements, have shown themselves to lead to profound consequences in people's health in today's world. The good performance in health in the East Asia region has been attributed to the vast reduction of early deaths and cardiovascular mortality in older ages, but the East Asian health advantage might become less prominent when quality of life is considered. The unique combination of cultural practice and values and social policies, as well as the lagged effects of previous public health interventions have contributed to the longevity in this part of the world. In the face of an aging world, efforts to discern the underlying pathways leading to higher quality of those added years is urgently needed.

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AUTHOR CONTRIBUTIONS

Eric T. C. Lai, Michael Marmot, and Jean Woo were responsible for conceptualizing this manuscript. Eric T. C. Lai was responsible for reviewing the literature, data curation and writing of the manuscript. All co-authors participated in critically reviewing and intellectually input to the drafts of the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Appendix S1. Life expectancies and healthy life expectancies in selected countries.

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