

Ageing and Wellness in Asia

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AGEING AND WELLNESS IN ASIA

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According to World Population Prospects 2019 (United Nations 2019), by 2050, 1 in 6 people in the world will be over the age of 65, up from 1 in 11 in 2019. All societies in the world are in the midst of this longevity revolution—some are at their early stages and some are more advanced. But all will pass through this extraordinary transition, in which the chance of surviving to age 65 rises from less than 50%, as was the case in Sweden in the 1890s, to more than 90% at present in countries with the highest life expectancy. What is more, the proportion of adult life spent beyond age 65 increased from less than a fifth in the 1960s to a quarter or more in most developed countries today.

These changes for individuals are mirrored in societal changes. Older persons are a growing demographic group in society and account for more than one fifth of the population in 17 countries today. Projections for the end of the century indicate that this will be the case in 2100 for 155 countries, covering a majority (61%) of the world's population (Figure 1).

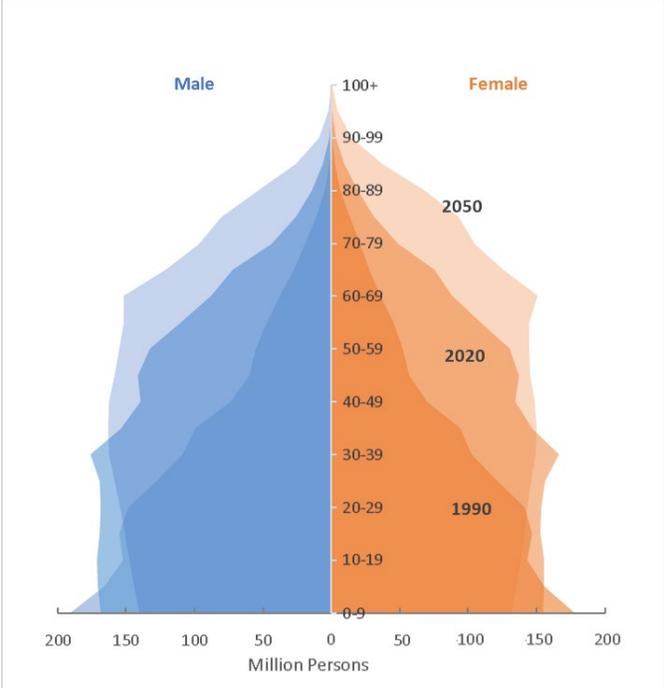
Traditionally, most researchers have used measures and indicators of population ageing that are mostly or entirely based on people's chronological age, defining older persons as those aged 60 or 65 years or over. This provides a simple, clear, and easily replicable way of measuring and tracking various indicators of population ageing. The recent development of alternatives to measures and indicators of population ageing, which are mostly or entirely based on people's chronological age, offers a more nuanced perspective of what population ageing means in different contexts. New measures and concepts of population ageing have significant implications for assessing the living conditions and living arrangements of older persons, their productive and other contributions to society, and their needs for social protection and health care.

Ageing in Asia

“Population ageing is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including labour and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and intergenerational ties.” – United Nations.

Asian economies are ageing and some quite rapidly. Between 2020 and 2030, the number of people in developing Asia aged 65 years or over is projected to grow by 46.2%, from 353 million to 516 million. By 2050, the population of older persons is projected to more than double its size, reaching nearly 839 million. By 2020, in terms of proportion to the whole population, 9% of the region’s population was older than 65, up from 6% in 2010, and is expected to double to 18% by 2050. Figure 1 shows the distribution of various age groups by gender in the population of developing Asia from 1990 to 2020, and the United Nations population projections till 2050. The figure illustrates a striking demographic shift from a typical pyramid shape to a structure that is more top heavy as the population is ageing. This means that, in 2010, while 1 in 16 persons living in developing Asia was over 65 years old, by 2050 it could be 1 in 6 (Figure 2). Looking across genders, by 2020 women accounted for about 53% of the population aged 65 years or over and this share is expected to stay stable.

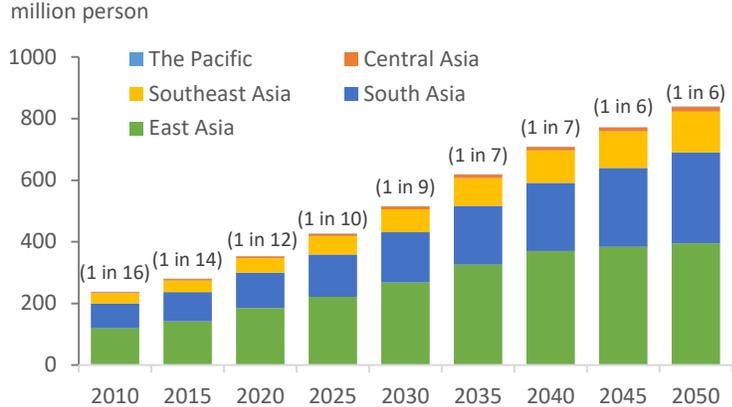
Figure 1: Population Distribution, Developing Asia



Source: United Nations Population Projections, <https://population.un.org/wpp/Download/Standard/Population/> (accessed 15 January 2020).

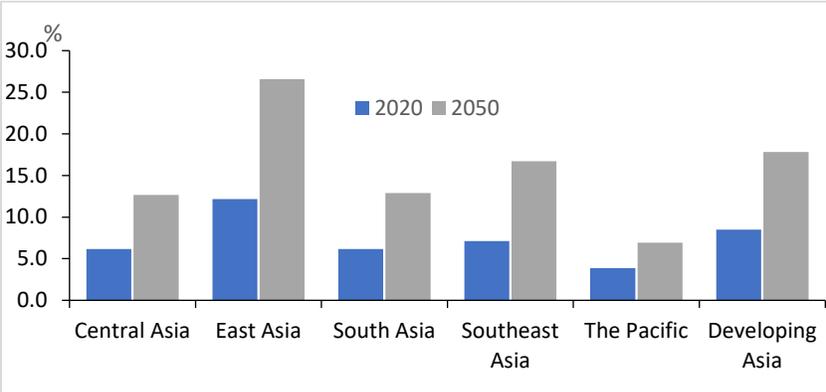
Among the subregions, East Asia has the highest proportion of population aged 65 or above, with more than half the number of developing Asia’s older people residing there. Projections indicate that the proportion of people aged 65 years or over will increase by 8.9 percentage points over the next 15 years, compared with the 4.6 percentage point increase that occurred between 2005 and 2020. Compared with East Asia, the proportion of older persons is expected to grow fastest in Southeast Asia (4.9 percentage points) between 2020 and 2035, followed by Central Asia (3.8), South Asia (2.8), and the Pacific (1.4).

Figure 2: Proportion of Population Aged 65 and Over



Source: United Nations Population Projections, <https://population.un.org/wpp/Download/Standard/Population/> (accessed 15 January 2020).

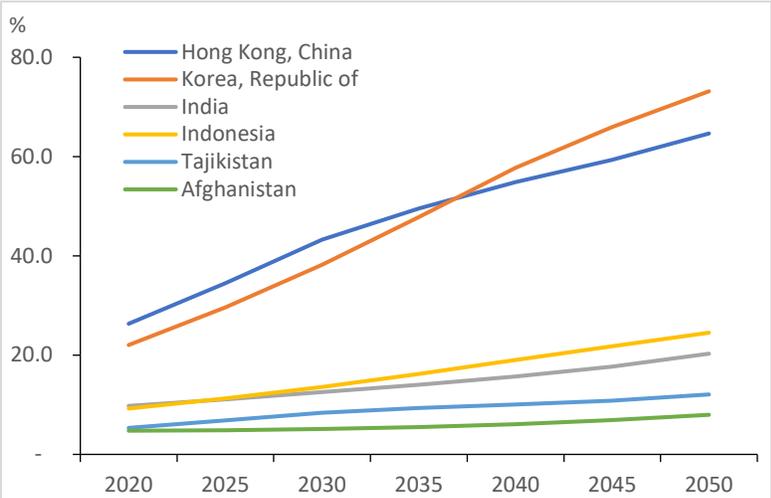
Figure 3: Share of Population Aged 65 and Over by Subregion



Source: United Nations Population Projections, <https://population.un.org/wpp/Download/Standard/Population/> (accessed 15 January 2020).

While demographic shifts are evident across subregions, the development stage varies in economies even within a subregion. This is evident on how the dependency ratio evolves, i.e., share of population aged 65 years or older to the working age population (15–64 years). For instance, the Republic of Korea Hong Kong, China can be classified at an advanced stage of demographic transition, with old-age dependency ratio of more than 22% in 2020, and expected to go up to 64% by 2050 (Figure 4). In the middle stage are India and Indonesia with about a 9% dependency ratio in 2020 that will increase up to 20% by 2050. On the other hand, Afghanistan and Tajikistan are classified at an early stage with the old-age dependency ratio stable.

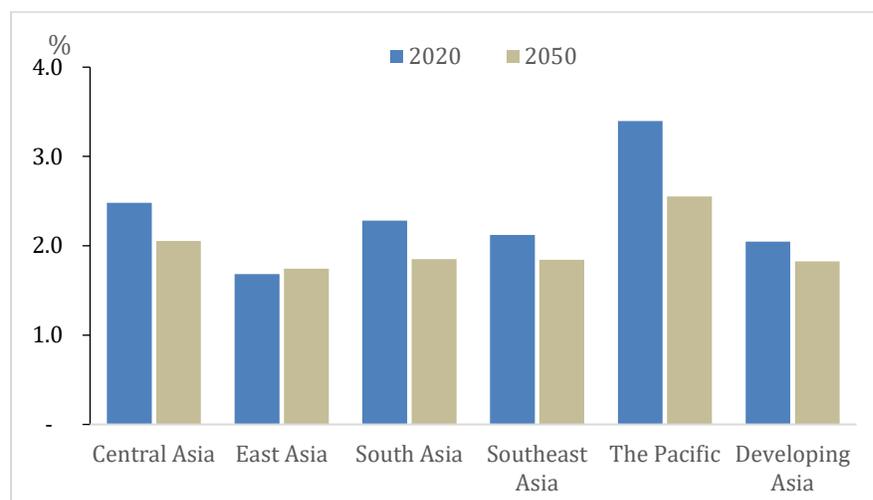
Figure 4: Old-Age Dependency Ratio, Selected Asian Economies



Note: Old-age dependency ratio is the share of population aged 65 and over to working-age population (15–64 years old). Source: Population Division, Department of Economic and Social Affairs, United Nations Secretariat. *World Population Prospects: The 2019 Revision*.

In other parts of the world, the shifts in demographic structure can be attributed mainly to declining rates of fertility and increasing life expectancy. Changes in fertility and mortality are associated with economic progress and development, and help to predict the present and future rates of growth of the older population. In Asia, a rapid decline in fertility began in the mid-1960s, which will result in a drop in the growth rate of older persons after 2025. However, more longevity will increase the number of survivors to older ages. So while in 1990, 65-year-old persons in developing Asia could expect to live an additional x years, on average, by 2020, this number had improved to 8.5 years, and by 2050, it will be 12.9 years. For many Asian economies, particularly in the advanced stages of demographic transition, the fertility rate is expected to decline slightly, and life expectancy rates that are already high will increase steadily. This suggests that the demographic shifts for these economies can be attributed to increased longevity.

Figure 5: Fertility, Selected Asian Economies



Source: Population Division, Department of Economic and Social Affairs, United Nations Secretariat. *World Population Prospects: The 2019 Revision*.

Table 1: Life Expectancy at Birth

	Total		Male		Female	
	2020	2050	2020	2050	2020	2050
Central Asia	72.5	76.2	69.4	73.2	75.5	79.2
East Asia	77.7	82.5	75.5	81.0	80.0	84.0
South Asia	70.4	75.2	69.1	73.4	71.8	77.1
Southeast Asia	73.1	77.6	70.2	74.9	76.2	80.3
The Pacific	66.8	71.1	65.2	69.2	68.4	73.2
Developing Asia	73.5	77.9	71.6	76.0	75.6	79.8

Note: Weighted average using population as weights.

Source: Population Division, Department of Economic and Social Affairs, United Nations Secretariat. *World Population Prospects: The 2019 Revision*.

Ageing or Healthy Ageing?

23% of the total global burden of disease is attributable to disorders in people aged 60 years and older. Although the proportion of the burden arising from older people (≥ 60 years) is highest in high-income regions, disability-adjusted life years (DALYs) per head are 40% higher in low-income and middle-income regions, accounted for by the increased burden per head of population arising from cardiovascular diseases, and sensory, respiratory, and infectious disorders (Wu et al. 2014) (Figures 1–4).

The leading contributors to disease burden in older people are cardiovascular diseases (30.3% of the total burden in people aged 60 years and older), malignant neoplasms (15.1%),

chronic respiratory diseases (9.5%), musculoskeletal diseases (7.5%), and neurological and mental disorders (6.6%).

Governments worldwide are moving with urgency to introduce policies that address population ageing. The Global Burden of Disease Study has noted that whether increased longevity is an opportunity or a threat to the stability of societies depends not only on whether populations are living longer, but whether they are experiencing the negative health effects of ageing. The negative health effects of ageing are characterized by progressive loss of physical, mental, and cognitive integrity, leading to impaired functions and increased vulnerability to morbidity and mortality (Chang et al. 2019).

In 2019, in a study published in *The Lancet*, the Global Burden of Disease used new metrics to calculate the risk to societies of the negative health effects of ageing. They began by taking global average 65-year-olds as the reference population, and calculated their equivalent age in terms of age-related disease burden for all countries. This enabled the authors to describe how countries with similar levels of overall age-related burden experience different onsets of ageing.

What the study found were:

- (i) 92 diseases were identified as age related, accounting for 51.3% (95% uncertainty intervals 48.5–53.9) of all global burden among adults in 2017.
- (ii) The rate of age-related burden ranged from 137.8 DALYs (128.9–148.3) per 1,000 adults in high Social Development Index countries to 265.9 DALYs (251.0–280.1) in low Social Development Index countries.
- (iii) The equivalent age to average 65-year-olds globally spanned from 76.1 years (75.6–76.7) in Japan to 45.6 years (42.6–48.2) in Papua New Guinea.

This new metric provides a means to facilitate a shift from thinking not just about chronological age, but about the health status and disease severity of ageing populations. The finding is striking: countries with similar levels of overall age-related burden experience different onsets of ageing. For example, 76-year-olds in Japan and 46-year-olds in Papua New Guinea have the same level of age-related disease burden as the global average 65-year-olds (Chang et al. 2019).

Related research has highlighted the importance of mental health and behavioural problems in setting in motion the development of a range of socioeconomically patterned physical illnesses. Across the three main socioeconomic position indicators and after adjustment for lifestyle factors, compared with more advantaged groups, low socioeconomic status was found to be associated with increased risk for 18 (32.1%) of 56 identified conditions. Sixteen diseases formed a cascade of interrelated health conditions with a hazard ratio greater than 5. This sequence began with psychiatric disorders, substance abuse, and self-harm, which were associated with later liver and renal diseases, ischaemic heart disease, cerebral infarction, chronic obstructive bronchitis, lung cancer, and dementia.

While primary prevention in adults aged younger than 60 years will improve health in successive cohorts of older people, much of the potential to reduce disease burden will come from more effective primary, secondary, and tertiary prevention that target older people. Policy and health-care practice that addresses psychological health issues in social context and early in the life course could be effective strategies for reducing health inequalities.

In countries where public transfers from taxation and benefits are relatively low, such as many in Southern Asia and Southeast Asia, individuals and families face greater pressure to finance their consumption during old-age. It is important to establish social protection programs that can be sustained over the long term to prevent poverty, reduce inequality, and promote social inclusion among older persons.

From an Asia-wide policy perspective, these findings underscore the importance of identifying exemplary policies and strategies that reduce DALYs and enhance quality of life so that these can serve as reference points for nationally tailored public health interventions to mitigate the negative effects of ageing and health, and to enhance opportunities for healthy ageing. If promoted across the life span, these strategies will be most effective.

Life span approaches to wellbeing place preeminent importance on a cluster of factors that contribute to quality of life as being central in ensuring a life journey towards fulfilled and healthy ageing. These include regular exercise; good nutrition; meaningful social relationships; ability to contribute to society; connection with nature through gardening, nature walks, and a positive mindset.

Aging and Its Demographic Impact on the Global Wellness Industry

1. Wellness and the Wellness Industry

The concept of wellness has evolved during the past decades from a special state of health (Dunn 1959), a choice to assume responsibility for the quality of one's own life (Ardell 1977), a state of being, an attitude, and an ongoing process (Travis 1984) to a way of life oriented towards optimal health and well-being (Myers, Sweeney, and Witmer 2000), a state of psychological well-being (Smith and Kelly 2006, and Smith and Puczko 2009), and a "positive state of affairs, brought about by the simultaneous and balanced satisfaction of diverse objective and subjective needs of individuals, relationships, organizations, and communities" (Prilleltensky 2011).

Wellness relates to the concepts of wellbeing, happiness, and quality of life. Corbin and Pangrazi (2001) introduced the concept of a "multidimensional" state of being, and both Corbin and Pangrazi (2001) and Voigt (2014) suggest that health lifestyle is important to attain wellness. The Global Wellness Institute has defined wellness "as the active pursuit of activities, choices and lifestyles that lead to a state of holistic health". With increasing awareness and attention paid to wellness, more demand for wellness products and services emerge in the market and contribute to people's wellness around the world. Thus, it is important to understand what factors drive the development of the wellness industry across

markets, so that related policies could be developed to foster the development of the wellness industry and boost people's wellness.

2. Potential Factors Relating to the Wellness Industry

The most recognized determinant of wellness, which therefore relates to the wellness industry, is income level. Intuitively, people with higher income are at a better position to boost their own wellness. There is some evidence on the association between income level and various aspects of wellness. For example, Sacks, Stevenson, and Wolfers (2010) examine relationship between income and wellbeing, and find that richer individuals are more satisfied in life. There is also a strand of literature that consistently document the positive relationship of well-being and real gross domestic product (GDP) per capita. (for example, D'Acci L. 2010; Clark and Senik 2010; Boarini 2012; Sacks, Stevenson, and Wolfers, 2010; Jones and Klenow (2016); and Diener, Tay, and Oishi (2013) find that GDP per capita show weaker associations with subjective wellbeing. Related to income level, consumption is also positively associated with wellness (Heady, Wooden, and Muffels 2008), especially spending on healthy and sustainable items (Xiao and Li 2012), and social issues such as donations (Dunn et al. 2008). Thus, disposable income level will also be an important factor for the wellness industry. Thus, this study considers both GDP per capita and consumption expenditure per capita as two possible factors affecting the wellness industry.

In addition to income level, GDP growth is also a driving force underlying the whole picture. When the economy is doing well, not only people's income will improve, but job security, social safety, business opportunity, and overall life quality will benefit also. Thus, good economic performance, proxied by GDP growth, will contribute also to the development of the wellness industry.

Wellness is not fully determined by economic progress, individual income, what is consumed. Socioeconomic and socioenvironmental factors have affected wellness also. Many studies show that determinants of wellbeing include culture and kinship, health and nutrition, employment and working conditions, social support networks, education, social relationships, environment, marriage, work life balance, social comparison, status anxiety, and individual lifestyle factors (Lanz-Kaufmann 2002, Hetzel et al. 2004, Smith and Sorsa 2012, Delhey and Dragolov 2014, Yi et al. 2015, Reyes-Garcia et al. 2015, and Schneider 2016). Although limited by data availability, this study utilizes the following social factors: aging (percentage of 65+-year-old in total population), healthy living (life expectancy at birth), employment, medical and educational situation (urbanization), and stability of socioeconomic conditions; and examines their impacts on the development of the wellness industry.

3. Data and Methodology

a. Data and Data Sources

The Global Wellness Institute (GWI) is the primary source of data for the dependent variables in this study. GWI has conducted country-level research to define and quantify five

sectors within the wellness economy (wellness real estate, workplace wellness, wellness tourism, spas, and thermal/mineral springs). For the other five sectors, GWI draws upon secondary sources to produce a global aggregate figure. In our analysis, number and revenue of hot springs, spas establishments, and wellness tourist arrivals for 124 global economies in 2017 are used to capture the level of the wellness industry development in global economies. All dependent variables are log transformed in the analysis.

Data on GDP growth rate, GDP per capita, financial consumption expenditure per capita, urban population percentage of total population, and life expectancy at birth are collected from the World Bank's World Development Indicators. The ratio of 65 years old and up to total population is from the United Nations Population Division. Political risk rating on socioeconomic conditions is collected from the PRS Group's International Country Risk Guide. The socioeconomic variable is an assessment of the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. The risk rating score has three subcomponents (being unemployment, consumer confidence, and poverty), each of them has a maximum score of 4 and minimum score of 0. A score 4 indicates very low risk and a score of 0 means very high risk to each subcomponent, and the socioeconomic condition score is the sum of the three. In the analysis, the economic and social factors that may be related to the wellness industry are as of 2016. The descriptive statistics of the sample are in Table 2.

Table 2: Summary Statistics of the Sample Data

Variables	Observation	Mean	Median	Minimum	Maximum	Standard Deviation
Dependent variables						
Log number of hot spring establishments	89	3.33	3.37	0.00	9.95	1.99
Log number of spa establishments	124	5.57	5.54	0.69	10.18	1.79
Log number of wellness tourist arrivals	124	13.41	13.57	6.08	18.99	2.59
Log revenue of hot spring establishments	88	17.41	17.47	9.35	23.59	2.69
Log revenue of spa establishments	124	18.52	18.71	12.64	23.76	2.19
Log revenue of wellness tourist arrivals	124	19.89	20.08	13.44	26.14	2.55
Explanatory variables						
GDP growth (annual %)	124	2.91	2.94	-17.04	13.40	3.16
Log GDP per capita (constant 2010 US\$)	124	8.90	8.95	5.97	11.61	1.49
Log Final consumption expenditure per capita (constant 2010 US\$)	124	8.62	8.74	5.72	10.99	1.37
Ratio of old 65 and up to total population	124	9.37	6.76	0.93	26.02	6.39

Variables	Observation	Mean	Median	Minimum	Maximum	Standard Deviation
Life expectancy at birth, total (years)	124	73.38	75.23	53.44	84.23	7.85
Socioeconomic condition	124	5.95	5.81	0.83	10.83	2.39
Urban population % of total population	124	65.24	67.98	16.29	100.00	20.92

GDP = gross domestic product.

Source: Authors' computation.

b. Methodology

To evaluate the factors that drive the development of the wellness industry across countries, we used cross-sectional regression with the following specification:

$$Y_i = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + \epsilon_i \quad ,$$

where k is a set explanatory variables X_j which includes GDP growth rate, log GDP per capita, log financial consumption expenditure per capita, life expectancy at birth, urbanization ratio % of total population, the ratio of 65 years old and up to total population, and socioeconomic conditions in each country i . In the analysis, 1-year lags of the explanatory variables are used to explain the development of the wellness industry in the sample countries.

4. Empirical Results

Using the cross-sectional regression analysis, Table 2 shows the results for the determinants of the wellness industry for sampled countries. It can be seen that individual macroeconomic development factors alone do not show significant association to the development of the wellness industry captured by hot spring establishment, spa establishment, and wellness tourist arrivals. Interestingly, the socioeconomic indicator that combines unemployment, consumer confidence, and poverty shows quite strong impact on the wellness industry, indicating the relevance of a sound the economic environment. Many social factors have significant associations with the wellness industry in these three aspects. In terms of hot spring establishments, a higher ratio of 65 years old and up to total population is significantly and positively associated to an increased number and revenue of hot spring establishments. 1% more total population with ages of 65 years and above will increase the number of hot spring establishments by 0.20% and increase the revenue from hot spring establishments by 0.29%. Also, more stable socioeconomic condition significantly relates to the revenue of hot spring establishments. One-point higher socioeconomic condition score is associated with 0.3% higher revenue generated from hot spring establishment. This evidence indicates that aged population may form greater demand in the wellness industry like hot spring to boost wellness.

Regarding the spa establishment, higher life expectancy and socioeconomic condition are both found to be significantly and positively associated with the number and revenue of spa establishment. One more year of life expectancy is related to 0.09% higher number of spa establishment worldwide and 0.12% more revenue generated by spa establishment. One more socioeconomic condition score will increase the number of spa establishment by 0.25% and revenue generated by spa establishment by 0.22%. This result indicates that both healthy lifestyles and stable socioeconomic condition foster the demand for the wellness industry, such as the spa establishment.

When turning to the wellness industry captured by wellness tourist arrivals, economies with higher life expectancy and stable socioeconomic condition attract more wellness tourist arrivals. One-year higher life expectancy is associated with 0.17% more wellness tourist arrivals and will boost revenue from wellness tourist arrivals by 0.17%. One-point higher socioeconomic condition score will increase the number of wellness tourist arrivals by 0.36% and revenue by 0.30%. This shows that the wellness industry will benefit from local market's higher quality for life and favorable socioeconomic condition. It is interesting to note also that 1% higher urbanization ratio post a 0.02% negative impact on the revenue generated by wellness tourist arrivals, indicating that some wellness tourist arrivals might seek rural rather than urban type of lifestyle.

Overall, the analysis reveals that both economic and social factors are relevant in the development of the wellness industry worldwide. Different wellness businesses that target customers bearing various social characters will see good opportunities in the future.

5 Study Conclusion and Discussion

This study discussed possible economic and social factors that may affect the development of the wellness industry in global economies. Using a group of macroeconomic and social attributes that are widely documented to be related to wellness, this study finds that the economic and social factors show significant association to the size of the wellness industry in global markets. In particular, aging is positively related to demand for hot spring, while the local market's quality of life and stability in socioeconomic conditions positively affect the spa establishment and wellness tourist arrivals into the market. This study sheds lights on how the development of the global wellness industry may cater to different customer demands in different local market conditions.

Table 3: The Association between Economic and Social Factors and the Development of the Wellness Industry

Variables	Log Number of Hot Spring Establishments	Log Revenue of Hot Spring Establishments	Log Number of Spa Establishments	Log Revenue of Spa Establishments	Log Number of Wellness Tourist Arrivals	Log Revenue of Wellness Tourist Arrivals
GDP growth (annual %)	-0.07693 (0.04774)	-0.03432 (0.06305)	-0.06820 (0.04119)	0.00958 (0.06186)	-0.02925 (0.05752)	0.01272 (0.06375)
Log GDP per capita (constant)	0.75762 (1.31562)	0.58996 (1.62989)	-0.16238 (0.73611)	-0.05531 (0.77567)	-0.84861 (0.96237)	-0.82380 (0.88543)
Log final consumption expenditure per capita	-1.86566 (1.50178)	-1.17719 (1.81109)	0.13801 (0.88920)	0.36477 (0.92281)	0.75314 (1.10229)	1.09454 (1.03172)
Urbanization ration % of total population	0.01105 (0.01295)	0.01740 (0.01557)	-0.01575 (0.00952)	-0.01543 (0.00985)	-0.01905 (0.01249)	-0.02068* (0.01168)
Ratio of old 65 and up to total population	0.19599*** (0.05653)	0.28665*** (0.05906)	0.03724 (0.03202)	0.02202 (0.03209)	0.06236 (0.03824)	0.00493 (0.03516)
Life expectancy at birth (years)	0.05954 (0.05031)	0.00445 (0.06374)	0.09010** (0.03555)	0.11876*** (0.04004)	0.16708*** (0.04550)	0.17284*** (0.04504)
Socioeconomic conditions	0.24451 (0.15102)	0.31747* (0.18607)	0.24560** (0.12149)	0.22452* (0.12762)	0.35797** (0.17719)	0.29856* (0.16033)
Constant	4.20818 (3.54788)	15.83431*** (4.67621)	-1.37116 (2.10799)	6.58783*** (2.25177)	0.82694 (2.73669)	4.59015* (2.53069)
Observations	89	88	124	124	124	124
R-squared	0.26031	0.47284	0.44697	0.58919	0.57342	0.61168
Adjusted R-squared	0.196	0.427	0.414	0.564	0.548	0.588

GDP = gross domestic product, *** p<0.01, ** p<0.05, * p<0.1.

Note: Robust standard errors are in parentheses.

Source: Authors' computation.

Retirement and Wellbeing

Retirement can either be an advantageous or disadvantageous period for those who retire. For many, it is a much-awaited reward for years of hard work—a time for relaxation and reaping the benefits of previous work life, unburdened by the daily grind. For others, though, retirement can be a time of economic, emotional, or social loss—a period that may be marked by deteriorating health and growing limitations. For years, researchers have been investigating the effects of retirement. Is retirement good, bad, or neutral for health? Or can continuation of work keep people healthy?

Definition of Retirement

Moon, Glymour, Avendaño, and Kawachi (2012) described retirement as “a life course transition involving environmental changes that reshape health behaviors, social interactions, and psychosocial stresses.” It is also a subjective developmental and social psychological change in identity and preferences (Dannefer 1984), which requires the restructuring of daily routines and social contacts (Kubicek, Korunka, Raymo, and Hoonakker 2011). From these definitions, we can see that retirement is not just an event but a process that involves change.

The Retirement-Health Nexus

There are two conflicting theories in the literature as to how retirement can affect wellbeing (Charles 2004). The first views work as a central part of one’s being so that one is likely to suffer psychologically if he or she no longer can view himself as a productive, contributing member of a society. This could result in a gradual withdrawal from social participation which leads to isolation, illness, and a decline in happiness and life satisfaction. The second views work as a “stressor”, and emphasizes the importance of doing other things. Retirement then is seen as an opportunity to restart life with more freedom and time to build relationships and engage in health-improving activities.

There is no dearth of studies that investigate the link between retirement and health. Whereas most researchers agree as to how health affects the individual’s retirement behavior, very little conclusive evidence exists on the question of how retirement affects health.¹ This is not surprising, given our definition above of retirement as a process involving change. Because people will have different pre-retirement conditions and situations,

¹ See van der Heide et al. 2013 and Zantinge et al. 2014 for a survey of these studies. See Horner and Cullen 2016, Oshio and Kan, 2017, and Hessel 2016 for a discussion of the methodological reasons that account for these conflicting results.

available resources, ability to adjust to retirement, and attitudes toward retirement, the impact of retirement will vary.

Many studies have confirmed that retirement has a beneficial effect on health. This is proven by studies that show improvement in health through cessation and reduction in smoking (Oshio and Kan 2017; Eibich 2015; Zhao, Konishi, and Noguchi 2017; Zhu 2016; and Insler 2014) and alcohol consumption (Motegi, Nishimura, and Terada 2016; Eibich 2015; and Zhao, Konishi, and Noguchi 2017), an increase in leisure activities and physical exercise (Oshio and Kan 2017; Motegi, Nishimura, and Terada 2016; Insler 2014; Eibich 2015; Zhu 2016; and Zhao, Konishi, and Noguchi 2017), and longer sleep duration (Motegi, Nishimura, and Terada 2016; and Eibich 2015). Also, there are studies that show positive change in overall health variables measured by self-rated health and mental health indicators (Kerkhofs and Lindeboom 1998; Coe and Lindeboom 2008; Coe and Zamarro 2011; Hessel 2016; Neuman 2008; Westerlund et al. 2010; Atalay and Barrett 2014; Hallberg, Johansson, and Josephson 2015; Zhu 2016; and Gorry, Gorry, and Slavov, 2018). Coursolle et al. (2010) show that workers who previously experienced a spillover from stressful work experiences to family life benefit from retirement and report higher levels of emotional well-being in retirement.

In contrast, retirement can have a negative effect on health through several channels like disruptions in life course, loss of key social role, and loss of income among others (Gorry, Gorry, and Slavov 2018).² For instance, if health is regarded as an input to one's labor output, then retirement may reduce investment in health since it would no longer affect wages. Further, people who unexpectedly or involuntarily retire (because of disability or retrenchment) may experience unanticipated loss of income, which can affect one's wellbeing and reduce expenditures in health to cope with the negative income shock. Retirement can also lead to social isolation and a diminished sense of purpose, which may worsen health and subjective well-being.

Several studies have tried to validate the above channels. Behncke (2012) and Moon et al. (2012) find that retirement increases the risk of being diagnosed with a chronic condition.³ Coe and Zamarro (2011) and Fe and Hollingsworth (2015) find that retirement has no significant impact on health, whereas Bonsang, Adam, and Perelman (2012); Rohwedder and Willis (2010); Mazzonna and Perra (2012); and Bingley and Martinello (2013) find that retirement is associated with declines in cognitive function, while Johnston and Lee (2009)

² Almost all studies have focused on the effect of retirement on individuals' health without assessing potential spillover effects within the couple. But studies have shown that the husband's retirement affects the health of the wife negatively (Bertoni and Brunello 2017, Atalay and Zhu 2018, and Messe and Wolff 2019).

³ One explanation of this pattern is that there is an endogenous relationship between retirement and ill health, and those who are not feeling well will choose to retire (Moon et al. 2012)

find that retirement has a positive short-term impact on mental health, but not on physical health in the United Kingdom. Results of a study done by Dave, Rashad, and Spasojevic (2008) indicate that complete retirement leads to difficulties in performing daily activities, illness, and mental degradation. According to the study, the effects tend to operate through lifestyle changes, including declines in physical activity and social interactions. Calvo, Sakisian, and Tamborini (2013) show that early retirements (those occurring prior to traditional and legal retirement age) dampen health. Also, symptoms of depression are more prominent among women retirees, especially those who retired involuntary and with a spouse who cannot fully support her (Szinovacz and Davey 2004).

Determinants of Retirement Satisfaction

While there is a tendency in economics to focus on the economic wellbeing of the retiree (i.e., in terms of retiree's income and wealth), mounting research has shown that both financial and nonfinancial variables affect subjective well-being.⁴ Factors like demographic characteristics (gender, marital status); personal resources (health, education, economic situation, and interpersonal relationships); characteristics of retirement (voluntary retirement, retirement time); retirement planning; leisure activities; and social integration and engagement determine the well-being in retirement. For example, gendered differences are evident in a study by Kubicek, Korunka, Raymo, and Hoonakker (2011). Preretirement physical health, tenacity in goal pursuit, and flexibility in goal adjustment are beneficial for the well-being of both men and women. By contrast, financial assets and job dissatisfaction are more strongly related to men's psychological well-being in retirement and preretirement social contacts to that of women. The adverse health effects of retirement mentioned earlier can be mitigated if the individual is married and has social support, continues to engage in physical activity post-retirement, or continues to work part-time upon retirement (Dave, Rashad, and Spasojevic 2008). The importance of getting back to work after retirement is more pronounced for involuntary retirement. A Scandinavian research finds that involuntary retirement is associated with decreases in both self-efficacy and life satisfaction in later life. Specifically, bridge employment alleviates the negative consequences of involuntary retirement and even seems to enhance post-retirement well-being for voluntary retirees (Dingemans and Henkens 2015).

Social engagement⁵ (Butrica and Schaner 2005; Cherry et al. 2013; Tiernan, Lysack, Neufeld, and Lichtenberg 2013; Kim and Feldman 2014; and D'Silva and Samah 2018) and participation in leisure activities (Kim and Feldman 2014, Sener et al. 2007, and Nimrod

⁴ Amorim and Franca (2019) present a systematic literature review of studies investigating variables that would improve well-being in retirement.

⁵ Social engagement includes participation in community meetings, voluntary labor, religious activities, and programs to improve neighborhoods and cooperatives.

2007) positively affect life satisfaction in retirement. In a cohort study conducted by Hajek et al. (2017), the authors report that social engagement decreased depressive symptoms of older adults aged 75 and over. As education plays an important role in determining cognitive abilities in retirement (Mazzonna and Perracchi 2012), planning for retirement increases retirement satisfaction (Noone et al. 2009). Even after controlling for pension income and wealth, retirees are found to have preferences on the type of pension they have (Bender 2012). Panis (2003) finds that annuities from pensions increase retirement satisfaction and reduce the number of depression symptoms.

Implications

The issue of how retirement affects the health of individuals has grave public policy implications. With continued growth in life expectancies and aging, many countries are facing large increases in the proportion of the population that are eligible to receive a publicly provided retirement pension. Investigating the consequences of retirement decisions is one of the first steps in addressing the mounting costs of supporting an aging population. Governments need to identify areas for intervention to assure higher levels of well-being for retirees. Strategies for retirement planning can include the increase of leisure activities, bridge employment for involuntary retirement, social engagement including volunteerism, beginning a new career, or even remaining in the same career on adjusted hours. As education has been found to play an important role in explaining heterogeneity in the level of cognitive abilities and its age-related decline (Mazzonna and Perracchi 2012), retirees should be encouraged to continue seeking knowledge and doing activities that will challenge their mental capacities. Advanced planning for retirement is clearly an important practice that should be established as young people enter the job market (França 2012 and França et al. 2013).

Wellness Pathways

1. Nutrition

Reflecting a life span perspective, the World Health Organization (WHO) has noted that many of the diseases suffered by older persons are the result of dietary factors, some of which have been operating since infancy. These factors are then compounded by changes that naturally occur with the ageing process (WHO 2020).

Dietary fat seems to be associated with cancer of the colon, pancreas, and prostate. Atherogenic risk factors, such as increased blood pressure, blood lipids, and glucose intolerance, all of which are significantly affected by dietary factors, play a significant role in the development of coronary heart disease.

Degenerative diseases such as cardiovascular and cerebrovascular disease, diabetes, osteoporosis, and cancer, which are among the most common diseases affecting older persons, are all affected by diet. Increasingly, in the diet/disease debate, the role that micronutrients play in promoting health and preventing noncommunicable disease (NCD) is receiving considerable attention. Micronutrient deficiencies are often common in elderly people because of a number of factors, such as their reduced food intake and a lack of variety in the foods they eat.

Another factor is the high price of foods rich in micronutrients, which further discourages their consumption. Compounding this situation is the fact that older people often suffer from decreased immune function, which contributes to this group's increased morbidity and mortality. Other significant age-related changes include the loss of cognitive function and deteriorating vision, all of which hinder good health and dietary habits in old age.

Elevated serum cholesterol, a risk factor for coronary heart disease in both men and women, is common in older people and this relationship persists into very old age. As with younger people, drug therapy should be considered only after serious attempts have been made to modify diet. Intervention trials have shown that reduction of blood pressure by 6 millimetres of mercury (mm Hg) reduces the risk of stroke by 40% and of heart attack by 15%, and that a 10% reduction in blood cholesterol concentration will reduce the risk of coronary heart disease by 30%.

Dietary changes seem to affect risk-factor levels throughout life, and may have an even greater impact in older people. Relatively modest reductions in saturated fat and salt intake, which would reduce blood pressure and cholesterol concentrations, could have a substantial effect on reducing the burden of cardiovascular disease. Increasing consumption of fruit and vegetables by one to two servings daily could cut cardiovascular risk by 30%.

Older adults are at increased risk of malnutrition, for a variety of physiological and psychological reasons. In turn, this has implications for health, quality of life, independence, and economic circumstances. Improvements in nutrition are known to bring tangible benefits to older people and many age-related diseases and conditions can be prevented, modulated, or ameliorated by good nutrition.

Practical and realistic approaches are required to optimize diet and food intake in older adults. One area where improvements can be made relates to appetite. Encouraging older adults to prepare meals can increase appetite and food intake, and providing opportunities for older adults to eat a wide variety of foods, in company, is a simple strategy to increase food intake.

The protein requirement of older adults is subject to controversy and, although considered the most satiating macronutrient, it appears that protein does not elicit as great a satiating effect in older adults as it does in younger individuals. This indicates that there is potential to increase protein intake without impacting on overall energy intake, involving strategies that can be easily and cost-effectively undertaken (Clegg and Williams 2018).

The link between good nutrition and good mental health is important to the mental wellbeing of older people. New research has been focussing on understanding the pathways that mediate relationships between diet, nutrition, and mental health. Findings point to the immune system, oxidative biology, brain plasticity, and the microbiome-gut-brain axis as key targets for nutritional interventions.

Writing for *The Lancet Psychiatry*. Dr. Jerome Sarris and colleagues of the International Society for Nutritional Psychiatry Research report that:

A traditional whole-food diet, consisting of higher intakes of foods such as vegetables, fruits, seafood, whole grains, lean meat, nuts, and legumes, with avoidance of processed foods, is more likely to provide the nutrients that afford resiliency against the pathogenesis of mental disorders. The mechanisms by which nutrition might affect mental health are, at least superficially, quite obvious: the human brain operates at a very high metabolic rate, and uses a substantial proportion of total energy and nutrient intake; in both structure and function (including intracellular and intercellular communication), it is reliant on amino acids, fats, vitamins, and minerals or trace elements. Dietary habits modulate the functioning of the immune system, which also moderates the risk for depression. The antioxidant defence system, which is also implicated in mental disorders, operates with the support of nutrient cofactors and phytochemicals. Additionally, neurotrophic factors make essential contributions to neuronal plasticity and repair mechanisms throughout life, and these too are affected by nutritional factors (Sarris, Mischoulon, and Schweitzer 2012).

There is evidence now that some nutritional supplements influence neurochemical modulation that, in turn, benefits the management of mental disorders. These supplements include omega-3 fatty acids, S-adenosyl methionine (SAME), N-acetyl cysteine (NAC), zinc, B vitamins (including folic acid), and vitamin D.

In a study on cognitive functioning and brain aging, higher levels of B family vitamins, as well as vitamins C, D, and E were all associated with higher scores on cognitive tests. The same positive relationship was found for omega-3 fatty acids, which have previously been linked to better brain health. But those with higher levels of trans fats, found in a variety of junk foods, performed more poorly in thinking and memory tests. Their magnetic resonance imaging (MRI) scans also revealed more brain shrinkage than people who had lower trans fats levels. The study found that, overall, nutrition accounted for 37% of the variation in brain volume (Bowman et al. 2012).

A landmark study has found that inexpensive B vitamins stopped shrinkage in the area of the brain that defines Alzheimer's disease, called the medial temporal lobe. The study, led by Professor David Smith from the University of Oxford, gave a combination of vitamin B6 (20 milligrams), B12 (500 micrograms), and folic acid (800 micrograms) or placebo pills to people with mild cognitive impairment (MCI), the stage before a diagnosis of dementia or

Alzheimer's. In those with high homocysteine levels, the specific areas of the brain associated with Alzheimer's disease shrank eight times more slowly in those taking B vitamins than in those on the placebo. This is strongly indicative that the B vitamins may be substantially slowing down, or even potentially arresting, the disease process in those with early stage cognitive decline. This is the first treatment that has been shown to do this (Douaud et al. 2013).

The Mediterranean diet is promoted globally as the dietary solution to NCDs. While it is clearly a beneficial dietary pathway to reduce inflammation and promote healthy nutrition, it is also a Western diet, studied by Westerners on Westerners, and is being recommended for 75% of the world's population that is not Western (Bodeker and Kronenberg 2015).

In Asia, the Japanese diet is well studied, and there are commonalities with the Mediterranean diet. They share high intake of unrefined carbohydrates, moderate intake of protein, healthy fat profile, low glycemic load, less inflammation and oxidative stress, and potential modulation of ageing-related pathways. A point of difference is that Asian diets typically include pharmacologically potent ingredients, such as turmeric in South Asia and Southeast Asia; umeboshi plums and reishi mushrooms in Japan; goji berry, ginkgo, and licorice root in the People's Republic of China; ginseng in the Republic of Korea; the brain tonic *Centella asiatica* in Thailand and Malaysia.

The Prospective Urban Rural Epidemiology study, published in *The Lancet* in August 2017, collected data on more than 135,000 individuals from 18 countries for an average of 4–7 years. The Prospective Urban Rural Epidemiology study assessed the association of nutrients with cardiovascular disease and mortality in low-income and middle-income populations. Findings showed that higher intakes of fats (including saturated fatty acids, monounsaturated fatty acids, and total polyunsaturated fatty acids) and animal protein were each associated with lower mortality. Carbohydrate intake was associated with increased mortality (Dehghan et al 2017).

The risk of total and non-cardiovascular mortality was in the order of 22%–23% lower for people that consume at least three servings per day of fruits, vegetables, and legumes, compared with participants who consumed less than one serving per day of these foods (Miller et al 2017).

Other research is looking at food additives as a source of disturbance to gut microbiota and, through this, to changes leading to cancer risk. Experimental findings on the role of common dietary emulsifiers that have an effect on gut microbiota support the notion that changing the composition of gut microbiota causes low-grade inflammation in a way that promotes colorectal cancer (Benoit et al. 2015).

2. Exercise

Ageing populations have potential for rapid increases in the incidence of health problems associated with ageing, such as falls, dementia, osteoporosis, and osteoarthritis. An essential change of focus that is required with population ageing is to resource and support

prevention approaches, which means that the future ageing population will age well more than the current older population. Health promotion and prevention programs also have the potential to support older people with multi-comorbidities to age well within the context of their existing health problems. Health promotion and prevention approaches are essential across the full spectrum of health of older populations. Exercise is one health promotion and prevention approach that has excellent potential to support ageing populations to age well (Hill forthcoming).

Exercise for older people has many benefits, including reduced risk of coronary and cardiac disease, diabetes, obesity, some cancers such as colorectal cancer, and reduced risk of falls (Sims et al. 2006). In addition to reducing the risk of many health conditions and chronic disease, there is strong research evidence that exercise can result in improved physical performance (balance, strength, mobility, function), improved mental health (improved mood, reduced depression), and improved quality of life. Although there are some generic benefits of exercise irrespective of the type of exercise undertaken (for example, most exercise approaches can result in improved mood or psychological wellbeing), different exercise types may also have different effects (termed specificity of training). An important example of this is the type of exercise that will be likely to reduce falls risk. An essential element of exercise to reduce risk of falls is that it needs to have moderate to high challenge to balance. Walking programs and resistance training programs in isolation, that do not include a challenge to balance, are not likely to reduce falls risk (Sherrington et al. 2017 and Voukelatos et al. 2015), although these type of programs have important other health benefits (Liu et al. 2009). Physical activity guidelines for older people recommend multimodal programs that incorporate balance, strength training, cardiovascular fitness training, and flexibility exercises (Sims et al. 2010), either within a single session (e.g., a group exercise program that targets each of these exercise types), or by mixing the type of sessions during the week to meet the 150 minutes recommendation for moderate to vigorous exercise (for example, separate strength, cardiovascular, and balance training sessions).

The WHO has defined a health-fitness gradient, which includes three broad subgroups to consider in exercise prescription. These include (i) the physically fit and healthy; (ii) the physically unfit and unhealthy, but independent (including a moderate proportion of the population who do insufficient levels, intensity, or types of exercise to maintain health, but have not yet developed significant health problems); and (iii) the physically unfit, frail, unhealthy, and dependent (which generally includes the component of the population often seeing multiple health practitioners to address their comorbidities). Each of these population subgroups can benefit from exercise.

An approach to exercise for older people that has not been the focus of much research until recently is exercising outdoors. Exercising outdoors can provide the same benefits as exercising indoors, but may have additional benefits, such as improved social interaction and mood (Krinski et al. 2017 and Rogerson et al. 2016) and sunlight exposure to improve vitamin D levels. A recent randomized trial found that exercise at a seniors exercise park (purpose built outdoors exercise park that is designed to improve balance, strength, flexibility, fitness, and function for older people) (Levinger et al. 2018) resulted in improved

physical performance (Sales et al. 2017), and high levels of enjoyment associated with the program (Sales et al. 2018).

The United States National Institutes of Health's National Center for Complementary and Integrative Health states: "Recent studies in people with chronic low-back pain suggest that a carefully adapted set of yoga poses may help reduce pain and improve function (the ability to walk and move). Studies also suggest that practicing yoga (as well as other forms of regular exercise) might have other health benefits such as reducing heart rate and blood pressure, and may also help relieve anxiety and depression." <https://nccih.nih.gov/health/yoga/introduction.htm>.

Renowned researcher, Professor Tiffany Field, director of the Touch Research Institute at the University of Miami has published a review and a book on clinical research on yoga (Field 2011 and 2012). The following is a summary of her findings.

Psychological effects. Field notes that at least two studies have demonstrated significant increase in mindfulness. Studies of yoga's effects on anxiety are common, with significant series and single session effects on measures of stress, anxiety, fatigue and depression, wellbeing, and vigor. She then cites several studies in which measures of depression decreased after extended practice (~2 months). Field also reviewed sleep studies focused on yoga's effects on insomniac, pregnant, geriatric, and pain syndrome groups. In all studies, yoga was found to have increased sleep efficiency, total sleep time, number of awakenings, and sleep quality.

Pain syndromes. For those suffering from pain syndromes, such as lower back pain, headaches, osteoarthritis, and rheumatoid arthritis, Field notes findings of significant pain reduction and less analgesic and opiate use in yoga than control groups, and that these findings held regardless of gender or age differences among participants.

Cardiovascular conditions. Field describes several studies addressing coronary artery disease and hypertension. In each, yoga was found to improve cholesterol and serum low-density lipid levels significantly. Yoga groups also had fewer anginal episodes, improved exercise capacity, decreased body weight, and lowered triglyceride levels than control groups. Blood pressure and blood glucose were reduced, and self-reported wellbeing and quality of life were increased.

Immune conditions. Field notes that, for immune (and autoimmune) conditions such as asthma, diabetes, multiple sclerosis, lymphoma, and breast cancer, yoga has been associated with several beneficial effects. For example, in studies of diabetes, daily yoga decreased blood glucose levels, including fasting levels, glycosylated hemoglobin levels, heart rate, systolic and diastolic blood pressure, and oxidative stress markers. Increased energy and decreased stress were also observed among diabetic groups. Lymphoma and cancer patients, too, Field reports, benefited from many of the same effects already mentioned, including lower sleep disturbance scores; reduced anxiety, pain, and fatigue; and increased relaxation.

Physiological effects of yoga practice. Field reiterates the physiological effects

documented across the studies reviewed, noting heart rate, blood pressure, EEG, pulmonary function, and oxygen consumption, as well as physical effects such as weight loss and increased balance and flexibility. Field goes on to cite studies focused on these physiological effects. For example, prolonged yoga training caused a decrease in exercise-induced heart rate in three mentioned studies, while another study found that baseline heart rate and lowest heart rate during a 6-minute exercise period were both significantly reduced in yoga versus walking groups. Vagus nerve activity, as measured by parameters associated with heart rate and heart rate variability, was significantly increased in yoga groups, as was oxygen consumption and breath volume. Contradictory evidence was found in another study mentioned by Field in which oxygen consumption was found to be lower following a yoga session than following rest alone. Yoga has also been found to reduce overall food consumption, eating speed, and food choices. Long-term yoga practice was also associated with lower weight gains, especially—notes Field—among overweight participants. <https://leeware.wordpress.com/2012/03/08/summary-of-fields-yoga-clinical-research-review/>.

Tai Chi

Tai chi, also called tai chi chuan, combines deep breathing and relaxation with flowing movements. Originally developed as a martial art in 13th-century (People's Republic of) China, tai chi is today practised around the world as a health-promoting exercise and a means of developing self-awareness (NHS Choices: <http://www.nhs.uk/Livewell/fitness/Pages/taichi.aspx>).

Tai chi, an excellent form of exercise for older people, has been shown to result in improved strength, balance, function, balance confidence, and improvement in some cardiovascular measures, even in the presence of health problems such as lower limb osteo-arthritis. However, some forms of tai chi are more challenging (e.g., from a balance or fitness perspective), and therefore are most suitable for more well older people (e.g., Yang style), while other forms of tai chi such as the Sun style, including tai chi for arthritis (Huang et al. 2017 and Song et al. 2007), are more suitable and safe for people with comorbidities, such as lower limb arthritis or reduced balance.

As balance is the core goal of tai chi—balance while in motion—it is no surprise that tai chi has been used as a means of developing and maintaining balance among those at most risk of falling and incurring often life-damaging injuries, viz. the elderly. A meta-analysis of studies on the effects of tai chi in preventing falling in the elderly found that tai chi exercise is effective indeed for preventing falls in older adults. The preventive effect seems to increase with the frequency of tai chi practice. Interestingly, the study found a difference in effect with different styles of tai chi. Yang style tai chi (created in the 19th century and the most widespread form of tai chi today) seemed to be more effective than Sun style tai chi, the most recently created form of tai chi (Huang et al. 2007).

In 2016, a map of 107 systematic reviews of tai chi was published. The map identified a number of areas with evidence of a potentially positive treatment effect on patient outcomes,

including tai chi for hypertension, fall prevention outside of institutions, cognitive performance, osteoarthritis, depression, chronic obstructive pulmonary disease, pain, balance confidence, and muscle strength (Solloway et al. 2016). As with all systematic reviews, there was a call for further research to be done to fine-tune these findings.

Dance

A quarter of a century of research has underscored the benefits of dance and dance movement therapy on generalized mental well-being on brain development in adults and children, on mood stabilization in adolescents, and in reducing depression and anxiety across the age-span. In short, dance has been shown to combine many different factors that contribute to improvement in the competence needed in everyday life.

Research across the age-span has highlighted the differing benefits of dance for different age groups. Research on the benefits of dance, as summarized in the Global Wellness Institute's White Paper on Mental Wellness (G. Bodeker in Bodeker et al. 2018), has found benefits across the life span.

Children, especially girls, have been found to make significant physical advances as well as improvements in measures of psychological well-being through dance training. Adults have been found to undergo structural brain changes associated with creativity and artistic expression.

Older-aged dance participants with Parkinson's disease have shown improvements in mobility, reduced tremor, and improved social outreach. There is an international program now called Dance for Parkinson's Disease that began in New York, and has spread to many countries. It offers dance as a means of enhancing quality of life and improving symptoms in people with Parkinson's disease.

A study by the New England Journal of Medicine examined physical and cognitive activities associated with reduced risk of developing Alzheimer's disease. The researchers found that cognitive activities, such as reading, playing board games, and playing musical instruments, were associated with a lower risk of dementia. However, of 11 physical activities, "dancing was the only physical activity associated with a lower risk of dementia".

Mental health conditions, such as anxiety and depression, have been reduced through participation in dance and dance movement therapy. A report in the online newsletter of the Harvard Mahoney Neuroscience Institute in the Harvard Medical School states that: "Studies show that dance helps reduce stress, increases levels of the feel-good hormone serotonin, and helps develop new neural connections, especially in regions involved in executive function, long-term memory, and spatial recognition" (Edwards 2016).

A new and comprehensive review of the neurobiology of dance started from the conviction that the existing body of evidence demands a start to teasing apart the neurobiological benefits of dance, drawing on the discipline of psychoneuroendocrinology.

Psychoneuroendocrinology proposes that psychology, behavior, and biology are interrelated, and that one can be accessed through the other.

The review found that dancing triggers the release of reward-related neurotransmitters, including endorphins and opioids. Dance, like all physical exercise, enhances immunoreactivity and improves caloric equilibrium, coordination, muscle tone, and cardiovascular health. In addition, dance practice provides strong psychobiological learning opportunities. In this regard, dance provides socio-emotional coping skills to increase self-confidence and boost self-esteem.

3. The Arts

Music

New research has found that music therapy can improve anxiety and depression, and enhance cognition in Alzheimer's patients (de la Rubia Orti et al. 2018, Gomez and Gomez 2016, and Fang et al. 2017). Music played while patients are in intensive care units has been found to abate the stress response, decrease anxiety during mechanical ventilation, and induce an overall relaxation response without the use of medication. Music may also improve sleep quality and reduce patient's pain with a subsequent decrease in sedative exposure leading to an accelerated ventilator weaning process and a speedier recovery (Mofredj 2016).

The very low rates of dementia among professional musicians, plus enhanced cognition and perceptual abilities in elderly musicians, have led to the proposition that engagement with music training and expertise leads to greater brain reserve capacity. Brain reserve capacity is an active process whereby alternative strategies are used to perform a function and also held to correspond with a person's number of synapses and brain size (Omigie and Samson 2014).

Findings from multiple studies that have been recently reviewed show that patients with severe mental illness, with difficulties in expression and communication, obtained benefits when they participated in programs of music therapy (Torres et al. 2016).

Art and Art Therapy

Arts and Minds, a British mental health charity, has been running weekly art workshops for people experiencing depression, stress, or anxiety in Cambridgeshire for the past decade. Run by artists, their Arts on Prescription project offers the opportunity to work with a range of materials and techniques, including printmaking and sculpture.

An evaluation of the project revealed a 71% decrease in feelings of anxiety and a 73% fall in depression; 76% of participants said their wellbeing increased and 69% felt more socially included. One participant commented: "I feel so much better having had the time and space to do some art. It makes such a difference." As the director of the charity observed: "The arts are important for wellbeing because beauty has a role in our lives. If we don't listen to that,

or pay attention, then that can cause problems”: <https://www.theguardian.com/healthcare-network/2017/oct/11/contribution-arts-make-health-wellbeing>.

Building on this understanding of the role of beauty and art in enhancing the human condition, art has been used as a therapeutic means of managing and reducing mental health problems. A systematic review of the clinical effectiveness and cost-effectiveness of art therapy among people with nonpsychotic mental health disorders has reported significant benefits from art therapy across mental health domains (Uttley et al. 2015).

Depression. Among nine studies examining depression, art therapy resulted in significant reduction in depression in six studies. In four of these six studies, art therapy was significantly more effective than the control.

Anxiety. Among seven studies examining anxiety, art therapy resulted in significant reduction of anxiety in six studies. In these six studies, art therapy was significantly more effective than the control.

Mood. Among four studies examining mood or affect, art therapy resulted in significant positive improvements to mood in three studies. In these three studies, art therapy was significantly more effective than the control.

Trauma. Among three studies examining trauma, art therapy resulted in significant reduction of symptoms of trauma in all studies. While trauma improved from baseline, there was no significant difference between the art therapy and control groups in any of the three studies.

Distress. Among three studies examining distress, art therapy resulted in significant reduction of distress in all studies. In two studies, art therapy was significantly more effective than the control group.

Quality of life. In four studies examining quality of life, art therapy resulted in significant improvements to some but not all components of the quality of life measures in all studies. In all studies, art therapy was significantly more effective than the control.

Coping. Among three studies examining coping, art therapy resulted in significant improvements to coping resources in all studies. In one study, art therapy was significantly more effective than the control. In another study, there was no difference between groups. In the third study, significant differences between the art therapy and control groups were not reported.

Cognition. In one study examining cognition, the control group (simple calculations) exhibited significant improvements in cognitive function relative to the art therapy group.

Self-esteem. In one study examining self-esteem, art therapy resulted in significant improvements in self-esteem relative to the control group.

4. Social Support

Aging is associated with an increased reliance on health-related and support services. Old age often goes hand in hand with increasingly complex and often interrelated problems, encompassing physical, psychological, and social health.

Social support consists of addressing tangible needs, such as assistance with transportation, home, and personal care, as well as emotional support, such as being listened to, understood, and comforted. Social support has been recognized as an important social determinant of health because it assists individuals in reaching their physical and emotional needs, and it reduces the effects of stressful events on their quality of life. More recently, many studies have demonstrated a relation between social support and health, including mortality, chronic diseases, cognition, depressive symptoms, and well-being. Self-rated health (SRH) is often considered to be a valid, reliable, and robust measure of health as well as a predictor of mortality among older people. Associations between low social support and poor perceived health, including health-related quality of life and SRH, have also been demonstrated. Therefore, interventions that target social support may be a priority to improve the well-being of older people and maximize their health and functional capacity.

A study comparing the elderly in two provinces in East Asia (Tainan in Taipei, China and Fuzhou in the People's Republic of China) found that participants identified children as the most important source of objective and subjective support, followed by spouse and relatives.

Tainan's elderly received more daily life assistance and emotional support, showed stronger awareness of the need to seek help, and maintained a higher frequency of social interactions compared with the elderly in Fuzhou. The mean objective support, subjective support, and support utilization scores as well as the overall social support among Tainan's elderly were significantly high compared with the scores among Fuzhou's elderly. Correlation analysis showed that social support was significantly correlated with city, age, living conditions, marital status, and SRH.

The World Happiness Report 2017 has identified four factors as best representing different aspects of the social foundations of wellbeing. These are (i) social support, (ii) freedom to make life choices, (iii) generosity, and (iv) absence of corruption in government and business.

Having someone to count on has a large impact on life evaluations even after allowing for the effects flowing through higher incomes and better health.

The World Happiness Report 2017 addresses the social foundations of happiness: "To feel secure, people need to feel that others care for them and will come to their aid when needed. To some extent, being in such a network of usually mutual obligations sets limits on each person's freedom to make life choices freely, as the interests of others must always be borne in mind. It is apparent from our results that both features are important for a good life. It is also clear from the data that these different aspects need not conflict with each other, as the most successful societies are ones where both measures of the social fabric are strong.

Indeed, some of the features of the social fabric that reflect its ability to care for people, in particular the health and education systems, also serve to level out the differences in life opportunities that affect the breadth and reality of the life choices open to each individual.” (p. 32)

5. Nature and the Environment

An approach to exercise for older people that has not been the focus of much research until recently is exercising outdoors. Exercising outdoors can provide the same benefits as exercising indoors, but may have additional benefits, such as improved social interaction and mood and sunlight exposure to improve vitamin D levels. A recent randomized trial found that exercise at a seniors’ exercise park (purpose built outdoors exercise park that is designed to improve balance, strength, flexibility, fitness, and function for older people) resulted in improved physical performance, and high levels of enjoyment associated with the program.

Being in nature as a means of restoring mental wellbeing is not new. The master of Chinese medicine, Sun Simiao, advised that fresh air, daily walks in natural landscapes, and food from a fresh and wholesome garden—cultivated in part by the owner—were the fundamentals of creating and maintaining good health. Sun Simiao was born around 581 CE and died in 682 CE after completing his 30-volume Encyclopedia of Medicine, the first few volumes of which were not dedicated to medicine at all, but to lifestyle, diet, and exercise. The Chinese poet and scholar Tao Yuanming, later known as Tao Qian (365–427), resigned his post as a civil administrator and chose a life of poetry, farming, family, friendships, wine, and, above all, a connection with the deep pulse of life, which is known in Chinese tradition as the Tao. Both Sun Simiao and Tao Qian have become Chinese icons of an ideal life in nature.

The ancient Indian tradition of going to the Himalayas for cold water bathing and doing morning exercises with the rising sun also have their roots in the healing power of nature and in humans balancing their lives by connecting with nature.

In Japan, there is the tradition of Shinrin-yoku, a term that means "taking in the forest atmosphere" or "forest bathing." The group Shinrin-Yoku.org lists research findings on Shinrin-yoku: (i) boosted immune system functioning, with an increase in the count of the body's natural killer cells; (ii) reduced blood pressure; (iii) reduced stress; (iv) improved mood; (v) increased ability to focus, even in children with attention deficit hyperactivity disorder (ADHD); (vi) accelerated recovery from surgery or illness; (vii) increased energy level; and (viii) improved sleep. <http://www.shinrin-yoku.org/shinrin-yoku.html>.

People tend to live longer when they have access to green space, and perceived neighborhood greenness is strongly associated with better mental and physical health. Those living in highly green areas are much more likely to have better physical and mental health than those living near open areas that are not highly green.

Another organization, Hope in Bloom, is a nonprofit group which plants gardens for breast

cancer sufferers. They note: “Healing gardens have been proven to be therapeutic sanctuaries offering both comfort and hope to meet the emotional and psychological needs of patients and their families. Many of our recipients are now in remission and attribute their good fortune in part to their gardens. Others report their gardens help reduce stress and anxiety, which strengthens their resolve to face an often-grueling treatment regimen” www.hopeinbloom.org.

6. Japan’s Ikigai

In Japan, ikigai is written by combining the kanji characters that mean “life” with “to be worthwhile”. Ikigai is a Japanese concept that means “reason for being”. It is the heart of things, the motivation at the center of our existence: the source of value in a person’s life or the things that makes them put one foot in front of the other each day.

Two Western researchers identified the characteristics and principles of Japanese who live longer with happiness. The book *Ikigai: The Japanese Secret to a Long and Happy Life* by Héctor García and Francesc Miralles defines the rules of ikigai. The authors conducted a total of 100 interviews in Ogimi, Okinawa to try to understand the longevity secrets of centenarians and supercentenarians. “What do Japanese artisans, engineers, Zen philosophy, and cuisine have in common? Simplicity and attention to detail.”

A deep connection with, and appreciation for, Ikigai is one probable reason for the remarkable longevity of the Japanese, particularly those residing in Okinawa. Here, there are 24.55 people over the age of 100 for every 100,000 inhabitants: far more than the worldwide average. The authors speculate that there are many factors which might collude to explain Okinawa’s disproportionate populace of centenarians: their uncommon sense of community; a non-exclusionary sense of oneness wherein even strangers are treated like brothers; access to lush hills and crystalline waters; Moringa tea; a light, nutritious diet; and moderate exercise, even after retirement. <https://www.water-for-health.co.uk/our-blog/2019/03/ten-rules-of-ikigai-a-blueprint-for-a-fuller-healthier-life/>.

The 10 lessons of Ikigai have been outlined as:

1. Stay active; don’t retire.
2. Take it slow.
3. Don’t fill your stomach.
4. Surround yourself with good friends.
5. Get in shape for your next birthday.
6. Smile.
7. Reconnect with nature.
8. Give thanks.
9. Live in the moment.
10. Follow your ikigai.

7. Ageing in Place

Successful ageing describes those who have overcome any functional age-related changes, chronic diseases, and limited disability to continue to lead productive lives, in line with the WHO's concept of healthy ageing that encompasses physical, cognitive, psychological, and social well-being. Other than lifelong learning and healthy lifestyles, a healthy environment (physical, social, and economic) plays an important role.

Professor Jean Woo of the Department of Medicine & Therapeutics, Chinese University of Hong Kong, and an authority on ageing in Asia, has highlighted the fact that many health care systems do not include systematic screening for such needs, in particular early identification of common geriatric syndromes such as frailty, sarcopenia, anorexia, mild cognitive impairment, and depression (Woo forthcoming). These conditions may predispose to functional decline, hence the call for rapid geriatric assessments in the community. A recent survey among 2,400 older persons aged 60 years and over who attend community centers in Hong Kong, China showed high prevalence of unmet needs, with memory problems (74%), chewing difficulties (63%), and pre-frailty and frailty (38%) being the most common problems, while about 20% reported low subjective well-being, had problems with instrumental activities of daily living, as well as insufficient income.

It follows that ageing in place is only desirable if conditions are met to optimize function to enable coping with common chronic disabling diseases, such as arthritis; stroke, as well as age-related syndromes such as sensory impairment; chewing difficulties; cognitive impairments (such as deficits in the domains of memory, processing speed, and executive function); impairments in instrumental activities of daily living; physical function; and psychosocial needs. Desirable goals with respect to aging in place include optimizing function by manipulating home design, furniture, and aids, and reduction in isolation with the help of social network/support as well as technology. For the majority of people, ageing in place will be synonymous with home living. However, this may not be possible, and moving to a more enabling environment may be indicated to achieve active ageing in spite of declining physical and cognitive function.

Safe and enabling homes

Ways to create a safe and enabling home include aids for bathing, dining, falls prevention, visual obstacle detection, transfer/lifting, cooking, emergency link, and ramp. Availability of personal care, communication external to home, and disease management are needed. Personal care may be provided by family members and/or formal carers. Both may require training in caring techniques, especially for those with dementia. A communication channel needs to be in place to allow rapid contact between the older person and carers in emergency situations (provided by alarms systems linked to mobile phones or dedicated services). In some countries, medical consultation may be provided with the primary care physician via telemedicine. From the point of view of maintaining social contacts to maintain a social network, technological advances have major contributions with smart TVs and mobile devices, and related software such as facetime. In terms of disease management, technology has also provided various monitoring devices that can identify deviations in usual pattern of

movements, aid physical training, medication management, as well as promotion of healthy diets (Woo forthcoming).

Computer-assisted interventions using touch screen video game technology have been also used in older Chinese adults with mild-to-moderate dementia to improve cognitive function and behavioral symptoms. The development of robots to aid home tasks as well as providing social interaction have been spearheaded by Japan, particularly for use in elder care. The use of the baby seal PARO is well known and used in many countries including Canada, Denmark, Italy, and the United States since 2003, particularly for dementia care. In 2009, it was certified by the Food and Drug Administration as a therapeutic device. Efficacy has been documented in various clinical trials in eliciting positive responses, improved moods, reduced depressive symptoms, and caregiver burden (Woo forthcoming).

Ageing in place requires understanding needs from the older person's perspective and must be personalized.

Age-friendly environments outside of the home

Age-friendly environments outside of the home should also be considered, which includes the immediate surroundings as well as the spaced and urban characteristics at a further distance from the home, such as walkability, supportive neighborhoods that builds a sense of community, and green spaces, designs of healing environments for hospitals. The design of immediate environment for homes and hospitals that have health benefits (healing environments) has been championed by some architects, emphasizing close proximity to nature.

The overall principles of age-friendly environments are summarized by the WHO's concept of age-friendly cities (AFC), covering age-friendly transport, housing, respect and social inclusion, civic participation and employment, health and community services, information and communication, social participation, and outdoor spaces and building. Since many older people live in urban cities, attention to these principles may make a difference to promoting healthy ageing instead of being obstacles. For example, a large cohort study of older people in Hong Kong, China aged 65 years and over showed that neighborhood green space is associated with lower risk of all-cause mortality, in particular those caused by circulatory diseases, as well as frailty progression. There is also variation in psychological health within a city, depending on urban characteristics such as building height and density interacting with socioeconomic characteristics. A key mediator in the relationship between the physical environment and well-being is walkability. It is the predominant factor associated with health-related quality of life and social support that is rated higher than leisure and social facilities in the older age group aged 65 years and over compared with younger people. A study of community where older people aged 65 years and over are living showed that walkability, walking time, wellbeing, and loneliness are linked (Woo forthcoming). Currently, social experiments are being carried out to redesign age-friendly communities in Kashiwa and Fukui in Japan, which incorporates all the AFC domains: https://www.jst.go.jp/ristex//en/e_exam/korei.html.

Policies for Healthy Ageing and ADB's Work on Long-Term Care

1. International Frameworks Related to Wellbeing in Older Ages

Since the turn of the 21st century, there has been a focus to developing international frameworks to promote well-being in older ages.

The United Nations Madrid International Plan of Action on Ageing (MIPAA) and the Political Declaration adopted at the Second World Assembly on Ageing in April 2002 marked a turning point in how the world addresses the key challenge of “building a society for all ages” in the 21st-century. They focus on three priority areas: (i) older persons and development, (ii) advancing health and well-being into old age, and (iii) ensuring enabling and supportive environments. They are resources for policymaking that suggest ways for governments, nongovernment organizations, and other actors to reorient the ways in which their societies perceive, interact with, and care for their older citizens, with the aim “to ensure that persons everywhere are able to age with security and dignity and to continue to participate in their societies as citizens with full rights” (para. 10). While MIPAA is nonbinding, every 5 years there is a systematic global review of its implementation, utilizing a unique process of review, which involves a participatory “bottom-up” element involving civil society and older persons themselves.⁶

In 2015, WHO member states approved a Global Strategy and Action Plan on Ageing and Health (2016–2020), and in 2020 approved the Decade of Healthy Ageing (2020–2030), which is the second action plan of the WHO Global Strategy on Ageing and Health, building on the United Nations MIPAA (1) and aligned to the timing of the United Nations Agenda 2030 on Sustainable Development (2) and the Sustainable Development Goals.

WHO defines healthy aging “as the process of developing and maintaining the functional ability that enables wellbeing in older age”. Functional ability is about having the capabilities that enable all people to be and do what they have reason to value. This includes a person’s ability to meet their basic needs; to learn, grow and make decisions; to be mobile; to build and maintain relationships; and to contribute to society.⁷ Within this framework of healthy aging, it is recognized that functional ability is comprised of an individual’s capacity and the interaction with the environment which can help or hinder a person from being able to do what they value. It recognizes that well-being in older age is comprised of different factors and the “cumulative impact of various social and economic determinants of health experienced throughout an individual’s life course” will be a major determinant of an individual’s well-being. It also emphasizes the need to take a life-course approach to healthy aging from birth onwards. The importance of prevention and delay of many chronic conditions that cause health issues in older persons through engagement in healthy behaviors across the life course is emphasized.

⁶ <https://www.un.org/development/desa/ageing/madrid-plan-of-action-and-its-implementation.html>.

⁷ <https://www.who.int/ageing/healthy-ageing/en/>.

There is no specific United Nations convention on the rights of older persons. The Open-Ended Working Group on Ageing was established by the United Nations General Assembly on 21 December 2010 through resolution 65/182. The working group's role is to consider the existing international framework of the human rights of older persons and identify possible gaps and how best to address them, including by considering, as appropriate, the feasibility of further instruments and measures.⁸

2. Translating International Frameworks to National Implementation

The third implementation review of MIPAA conducted in 2017 concluded that, since 2002 in the Asia and Pacific region, there had been a positive increase in national legislations, policies, and action plans to protect and promote well-being at older ages. For example, in Thailand to date, there have been two long-term National Older People's Plan (1986–2001, 2002–2021) supported by 5 year action plans. Thailand's recent National Strategy (2018–2037) recognizes that, to prepare for a quality aging, society must provide “opportunities for new businesses to cater to the needs of the elderly population”.⁹

The third MIPAA review also highlighted that government's self-reported challenges in implementing the Plan being insufficient budgetary allocations and a lack of dedicated personnel within governments to working in aging issues.¹⁰ Singapore has taken action to address both of these challenges. In 2011, the Ageing Planning Office was established under the Ministry of Health. The Ageing Planning Office has a responsibility to bridge all relevant government services in the planning and implementation of new initiatives towards successful ageing across sectors, including health, education, transportation, and housing.

In 2015, after a period of public consultation, the Government of Singapore launched the Action Plan for Successful Ageing, a S\$3 billion (about US\$2.2 billion) a comprehensive set of projects, recognizing the many factors that enable wellbeing.

The Action Plan for Successful Ageing has more than 70 initiatives in 12 areas, including health and wellness, education and learning, employment, income sufficiency, protection for vulnerable seniors, housing, transport, public spaces, social inclusion, volunteerism, health care and aged care, and research. The action plan groups initiatives into three levels: Opportunities for All Ages at the individual level focuses on employability, lifelong learning, volunteerism, health, and retirement adequacy. Kampong for All Ages at the community level focuses on developing communities of care to support ageing in place, promoting intergenerational harmony, encouraging love and respect for seniors, and planned legislation protecting older people from abuse. City for All Ages at the national level focuses on the health care system, housing, transport, public parks, senior-friendly design of public buildings and spaces, and research in ageing. The aim is to make Singapore an AFC in which all people age well, and to celebrate longevity.

⁸ <https://social.un.org/ageing-working-group/>.

⁹ National Strategy of Thailand, 2018–2037, para. 4, unofficial translation. <http://nscr.nesdb.go.th/wp-content/uploads/2019/10/National-Strategy-Eng-Final-25-OCT-2019.pdf>.

¹⁰ <https://www.unescap.org/sites/default/files/publications/Addressing%20the%20Challenges%20of%20Population%20Ageing%20in%20Asia%20and%20the%20Pacific.pdf> (p.61).

Conclusion

Healthy ageing needs to begin in childhood. Policies to support this make most sense when embedded within the rationale of an overarching life span framework such as Japan's One Hundred Year Life policy. Early nutritional, environmental, social, and exercise experiences have lasting effects on the health of the adult throughout their life span. These effects can be intergenerational. The concept of retirement is being rethought globally, with 70 or 75 now being considered as a realistic retirement age for people who may live for 2–3 years beyond this retirement date. The question of how these years can be lived in health is facing every economy in Asia. New research shows that ageing takes place at different rates across societies in Asia, with a “global 65 years” being experienced at age 45 in Papua New Guinea and at age 75 in Japan. This disparity in ageing rates means that different countries will have different levels of health care burdens according to the rate at which their populations age.

Nutrition is of fundamental importance in reducing the risks associated with lifestyle diseases (NCDs) and their growing burden on society and national health care budgets. It turns out that traditional Asian diets have much to offer that aligns with recognized best nutritional guidelines for the prevention of NCDs. Agricultural, market, and health promotion policies need to be aligned to this reality to support the expansion of healthy ageing across Asia.

Exercise is also of primary importance in reducing the risk of people developing NCDs. Exercising outdoors in a non-polluted space can be of double benefit because being in nature has well documented benefits on cardiovascular health, immunity and mental wellbeing. Dance has been shown to be an especially beneficial form of exercise for older people in that it promotes social exchange, is a form of movement that is focused on communication thus activating communication areas of the brain, and it has shown benefits in reducing the symptoms of both Parkinson's disease and Alzheimer's.

Social support, especially friendship and meaningful social interaction are vital for ensuring mental wellbeing in later life. The Japanese philosophy of Ikigai highlights the essence of a purposeful life, with good nutrition, regular movement, good social networks a positive outlook (and a smile) all have on optimal ageing into later years.

Across Asia, there is a wealth of traditional wellbeing practices that can be drawn upon for enhancing nutrition, movement, social interaction, and inner wellbeing. Healthy ageing is of vital importance for the economies of the region as citizens live longer and also as many spend their later years afflicted by NCDs. A wellness path to personal and national health needs to be at the heart of trans-sectoral planning in Asian economies, harnessing the productive capacity of seniors, reducing needless disability from the effects of poor dietary and other lifestyle choices, and creating the knowledge and foundations for lifelong wellbeing in younger generations.

The Asian Development Bank's Response

Challenges and opportunities presented by population aging have been recognized in Strategy 2030 of the Asian Development Bank (ADB) with specific reference to operational priority (OP) 1 on addressing remaining poverty and reducing inequalities as well as Sustainable Development Goals “leave no one behind” agenda, OP2 (accelerating progress in gender equality), OP4 (making cities more livable), and OP5 (promoting rural development and food security).¹¹

Population aging is happening at an unprecedented pace and at a time when traditional family support systems are weakening because of factors such as migration and expanding labor market participation by women. Concurrently, longevity and the rise in NCDs are leading to increases in multi-morbidities and syndromes such as dementia, resulting in complex care cases requiring skilled care in which there is very little capacity. A result of increasing importance within the region is the development of long-term care systems that enable persons with significant declines in functional capacity to age well, and to alleviate the widening gap between demand and supply. In response, ADB has an increasing portfolio of technical assistance and lending to its developing member countries that is related to the development of long-term care systems and quality services.

Further, during the implementation of its Strategy 2030, ADB can support its developing member countries in investing in policies and programs that enable the population to age well through the development of social protection policies; adaptation of health systems; provision of training and education for the health care workforce; promotion of lifelong learning and skill adaptation; and investments in inclusive environments, including infrastructure, housing, and transport, as well as long-term care. Such investments will enable older people to fully participate in society, including in the labor market, and reduce risks for themselves and their families.

Summary Points

1. All societies in the world are in the midst of a longevity revolution. Older people account for more than one fifth of the population in 17 countries today, and projections to the end of the century indicate that this will be the case in 2100 for 155 countries, covering a majority (61%) of the world’s population.
2. About one quarter of the total global burden of disease is attributable to disorders in people aged 60 years and older. Across the three main socioeconomic position indicators and after adjustment for lifestyle factors, compared with more advantaged groups, low socioeconomic status is found to be associated with increased risk for 18 (32.1%) of 56 identified conditions. It is important for governments across Asia to establish social protection programs that can be sustained over the long term to prevent poverty, reduce inequality, and promote social inclusion among older persons.

¹¹ ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.

3. Many of the diseases suffered by older persons are the result of dietary factors, some of which have been operating since infancy. Traditional Asian diets have much to offer that can reduce the risk of NCDs and are culturally more acceptable than the widely recommended Mediterranean diet. Food, agriculture, and trade policies—which were often originally devised to ensure quantity rather than quality of food—must remove incentives to produce less healthy foods and create incentives to produce diverse and nutritious foods using sustainable practices and take action to create healthy food environments, supported by nutrition education, especially in schools.
4. Exercise is one health promotion and prevention approach that has excellent potential to support ageing populations to age well. Health benefits of exercise for older people include reduced risk of coronary and cardiac disease, diabetes, obesity, some cancers such as colorectal cancer, and reduced risk of falls (Sims et al, 2006). In addition to reducing the risk of many health conditions and chronic disease, exercise can result in improved physical performance (balance, strength, mobility, function), improved mental health (improved mood, reduced depression), and improved quality of life.
5. Aging at home is only desirable if conditions are met to optimize function to enable coping with common chronic disabling diseases, physical function, and psychosocial needs. Desirable goals with respect to aging in place include optimizing function by manipulating home design, furniture, and aids; and reduction in isolation with the help of social network/support as well as technology. Enabling elders to live at home rather than enter care or be hospitalized reduces the economic burden of a growing population of the frail elderly and provides humane options for those who are vulnerable.
6. Age-friendly environments outside of the home include the immediate surroundings as well as the spaced and urban characteristics at a further distance from the home, such as walkability, supportive neighborhoods that build a sense of community, and green spaces, designs of healing environments for hospitals. WHO's AFC model offers direction and guidelines for planning for the elderly to remain active in their lived environments.

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