COMPONENT ONE

Active Ageing Index for China

Comparative Analysis with EU Member States and the Republic of Korea

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Acronyms used

AAI	Active Ageing Index
AHA.Sl	Active and Healthy Ageing Strategy in Slovenia
CES-D	Centre for Epidemiologic Studies Depression Scale
CFPS	China Family Panel Studies
CGSS	China General Social Survey
CHARLS	China Health and Retirement Longitudinal Study
CHIP	Chinese Household Income Project
CLHLS	Chinese Longitudinal Healthy Longevity Survey
ELSA	English Longitudinal Study of Ageing
EQLS	European Quality of Life Survey
ESS	European Social Survey
EU	European Union
EU-LFS	EU Labour Force Survey
EU-SILC	European Union Statistics on Income and Living Conditions
EU-SILC	EU Survey of Income and Living Conditions
GAWI	Global AgeWatch Index
GDP	Gross Domestic Product
HDI	Human Development Index
HLE	Healthy Life Expectancy
HRS	Health and Retirement Survey
ICT	Information and Communications Technology
ILO	International Labour Organisation
KLoSA	Korean Longitudinal Study of Ageing
MA:IMI	Mainstreaming Ageing: Indicators to Monitor Implementation
MIPAA	Madrid International Plan of Action on Ageing
MoPAct	Mobilising the Potential of Active Ageing (in Europe)
NBS	National Bureau of Statistics
OECD	Organisation for Economic Cooperation and Development
RIS	Regional Implementation Strategy
RLE	Remaining Life Expectancy
SAGE	Study on Global Ageing and Adult Health
SDGs	Sustainable Development Goals
SHARE	Survey of Health, Ageing and Retirement in Europe
SIS	Shanghai Implementation Strategy
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFPA	United Nations Population Fund
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WHO	World Health Organisation
WHO-5	World Health Organisation – Five Well-Being Index

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EU-CHINA
Social Protection Reform Project
中国-欧盟社会保障改革项目

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Executive Summary

Why Active Ageing Index?

The Active Ageing Index, AAI, was developed initially only for 28 the European Union (EU) member States during the 2012 European Year on Active Ageing and Solidarity between Generations[1]. Since then, it has been extended into several non-EU countries offering an approach to measure and monitor the concept of active and healthy ageing among populations of older persons.

The strength of the AAI approach is in the selection of a dashboard of multidimensional indicators of active and healthy ageing which are then aggregated into composite measures around policy domains. The calculations are carried out at the country level, with a breakdown between older men and women aged 55 or more. The AAI provides a monitoring and benchmarking instrument on positive paradigms of ageing that is complementary to policy frameworks such as the Madrid International Plan of Action on Ageing (MIPAA).

What does this report offer?

This report calculates for the first time the Active Ageing Index for China. It reviews data sources in China and assesses their potential relevance and applicability for developing the AAI for China that is comparable (*as much as possible*) to the AAI for EU countries. This research work is funded by the EU-China Social Protection Reform Project[2], during 2018. It is an extension of the research commissioned by United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)[3], during 2017.

The research offers critical policy relevant insights for China given its rapidly ageing society. Since the strength of the AAI is in its comparative analysis of multiple countries, we have also undertaken work towards the construction of the AAI for South Korea, another East Asian country where the speed of ageing is considerable. The AAI results for China have been compared with South Korea as well as with the average across the EU countries to better appreciate the situation in China, for mutual learning and to point to strengths and weaknesses of its policies in the pursuit of active and healthy ageing.

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1 The first detailed results of the AAI for the European Union Member States were included in: Zaidi, A., Gasior, K., Hofmarcher, M.M., Lelkes, O., Marin, B., Rodrigues, R., Schmidt, A., Vanhuysse, P. and Zolyomi, E. (2013) Active ageing index 2012 concept, methodology and final results, Research Memorandum/ Methodology Report, European Centre Vienna, March 2013. Available at: www.euro.centre.org/data/aai/1253897823_70974.pdf

2 The EU-China Social Protection Reform Project (SPRP) is a project co-funded by the European Union and China, running from 2014 to 2018. This report was commissioned from Component 1 of the SPRP which is about consolidation of institutional capacity for social protection policy development and reforms in collaboration with the National Development and Reform Commission (NDRC). For more details, see https://www.euchinasprp.eu/en/

3 See Zaidi, A., Parry, J. and Um, J. (2018) 'Developing a toolkit to monitor implementation of the Madrid International Plan of Action on Ageing: The context of the Asia-Pacific region', Social Development Working Papers 2018/02, The Economic and Social Commission for Asia and the Pacific, Bangkok.

What does the AAI for China tell us?

The AAI score for China is 37.8, which is higher than that of Korea (35.4) and the EU average (33.9). If considered in the ranking together with Korea and 28 EU countries, China is 7th out of these 30 countries. On the whole, we can see that China does very well in terms of active and healthy ageing of its older population.

When disaggregated by sex, the Chinese male population would rank 4th, and its female population would rank 9th. There is thus a need for a greater examination of the AAI for female population in China, so that the gender differentiation in the active ageing experiences in China can be better understood. Note that a similar gender difference also exists in Korea and in the EU countries, especially in the Southern European countries.

The high ranking of China is mainly due to the high rate of labour force participation in China. Even though the employment rate is lower for older age groups, in China, in the population aged 70-74, still about 34.2% of male population and 31.7% of female population are working. It is a unique phenomenon in China, as many continue working on their lands till late in their lives. The other domains, 'social participation', 'independent, healthy and secure living' and 'the capacity and enabling environment' would rank China as 10th ,25th and 17th, respectively.

This analysis provides for an enhanced understanding to Chinese authorities of the active ageing experiences of its older population, and mutual learning from Europe in the Chinese economic and social contexts. The Chinese performance on the AAI is revealed to be strong in terms of employment, healthy life expectancy, physical exercise, and mental well-being. However, in several areas China's comparative position to the EU AAI average has been low, such as in terms of older persons' internet access, levels of lifelong learning, and on income deprivation. Comparison with another East Asian country, South Korea, indicates some notable differences in active ageing, such as high engagement in providing care to children/grandchildren and older persons in China, but levels of a relatively high unmet needs of medical and dental care amongst the elderly.

Future work programme

Our analysis has indicated that the AAI in its current form is more suited to the needs, priorities and datasets of the EU countries, unsurprisingly since it was first developed with the EU countries in mind. However, the AAI for China offers some useful insights, especially in view of the unavailability of alternative metrics. As expertise around the AAI is becoming more attuned to the broader data compliance and adoption of positive approaches in addressing challenges of a rapidly ageing developing world, a new updated global version of the AAI is required, to offer a robust and functional set of metrics for age-disaggregated evidence and policy making on ageing.

Chapter 1: Motivation of the Active Ageing Index (AAI)

1.1 The World Health Organisation's approach to active and healthy ageing

The international agenda for discussion around active and healthy ageing has been set by the World Health Organisation (WHO). This has included how the concepts are operationalised and utilised in developing national and international strategy, a key aspect of which has been the Madrid International Plan for Action on Ageing (MIPAA). Notably, the WHO defined 'active ageing' in terms of participation of older persons in activities that contribute to their quality of life and well-being, specifically:

> "*the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age.*" (WHO, 2002:12)

By contrast, the WHO's work on 'healthy ageing' has also included intrinsic health factors and capacities around ageing trajectories within individual environments, in addition to how these are managed in a more holistic sense. Correspondingly, the WHO defines healthy ageing as:

> "*the process of developing and maintaining the functional ability that enables wellbeing in older age."* (WHO, 2015: 28)

Importantly, the concept of healthy ageing places less emphasis on disease and co-morbidity, and more on a consideration of social factors, and how these affect functioning in later life. An important component of the WHO's work on the issue has been its attempt to capture resilience to adversity within individual ageing processes, in terms of psychological traits, physiological characteristics, and environmental conditions. Key to healthy ageing is an appreciation of what is valued and can be sustained as people age, which includes factors such as safety, relationships, and autonomy. This can be assessed in terms of person-environment fit, and conversely the approach can be used to draw attention to health inequalities. Healthy ageing thus enables public health strategists to identify differences within the population, and to tailor health systems and services around these, offering appropriate interventions and support around distinctive or overlapping sets of needs.

1.2 Development of the AAI for EU countries

Prompted by rising life expectancy and demographic transition, the Active Ageing project was developed by European collaborators over the period 2012-15. It sought to quantify the evidence base around active and healthy ageing to produce comparative and independent information that could feed into policy makers' agendas (Zaidi and Stanton, 2015; Zaidi *et al.*, 2017). This dataset was developed into the Active Ageing Index (AAI), a composite measure divided into four broader policy domains, each of which collects information on individual indicators. Data from all the indicators, 22 in total, can then be analysed individually, or amalgamated to provide a policy domain score, and all domains combined again to produce an overall score. Thus, the AAI provides policy-makers with a numerical measure of active and healthy ageing that is multidimensional and it can be broken down by distinctive policy components.

Scores on the AAI range from 0 to 100: 100 representing the best possible result that can be achieved on each given dimension, although it is not anticipated that this stands as a realistic goalpost for any country. Indeed the 2015 AAI analytical report set the goalpost score at 57.5, based on the maximum values observed thus far across countries (Zaidi and Stanton, 2015). To provide a point of reference on how countries currently rank in the AAI, in 2014 the average EU28 score was 27.8, with Sweden leading progress on ageing with an AAI score of 43.4.

AAI scores are useful in indicating country-level progress on issues over time, benchmarking between countries, and tracking the impact of individual policy programmes. The emphasis in the AAI has been less on well-being in later life, although active ageing can be considered a pre-requisite for well-being of individuals (Walker and Zaidi 2016). Instead, the AAI has set out to measure older persons' contributions collectively, as well as indicating their untapped or restricted potential.

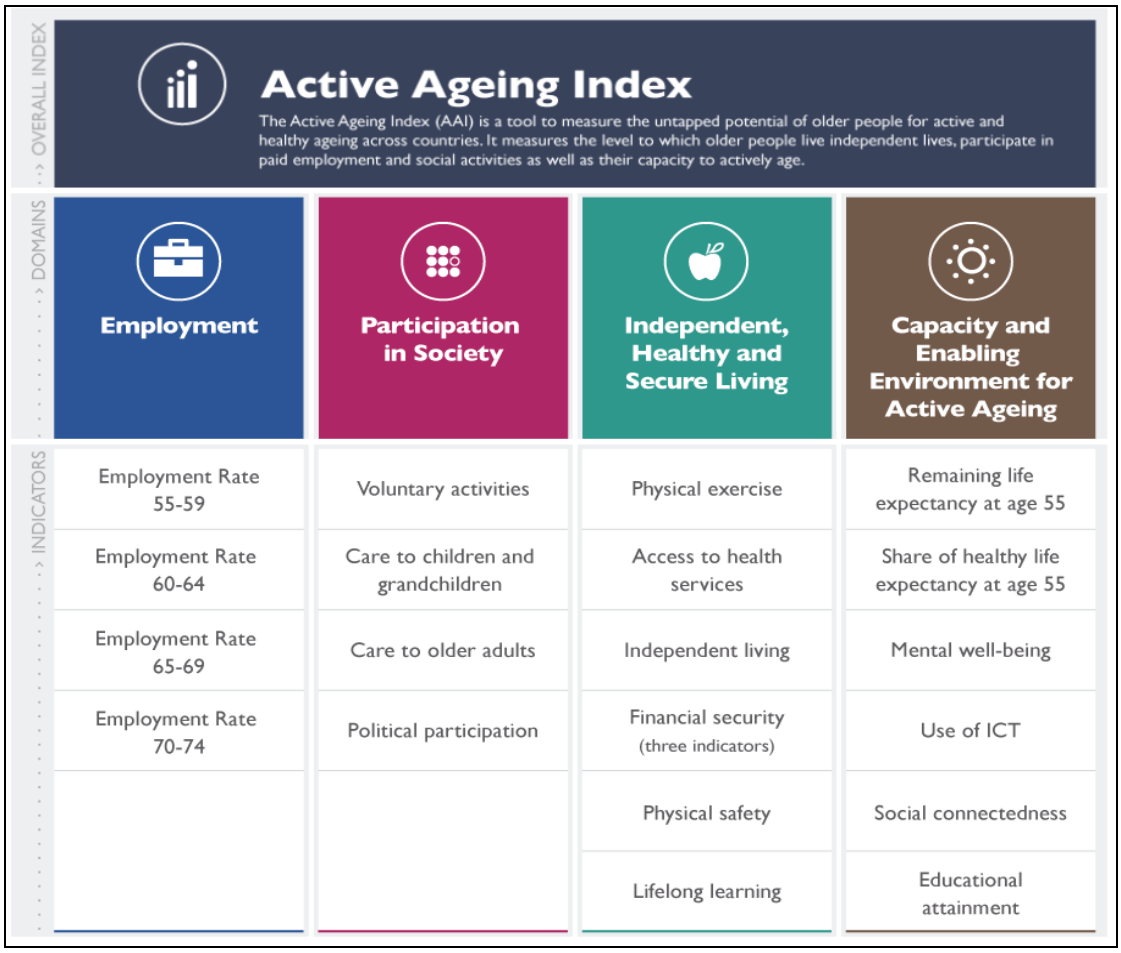
In the AAI development, the datasets which were drawn upon to make calculations included: the EU Labour Force Survey (EU-LFS), European Quality of Life Survey (EQLS), EU Survey of Income and Living Conditions (EU-SILC), and the European Social Survey (ESS). The AAI was intentionally designed to draw upon the datasets that offered broadest geographical coverage across the European region (Zaidi *et al.*, 2017), so that its more expansive applicability can therefore be assumed. Data can be disaggregated by age and gender, which underlines nuanced policy development, and in large part data collection has focused on persons aged over 55. Originally focusing on EU countries, the AAI has more recently been extended to cover a broader range of countries that include Russia, the USA and India. However, it is a project that is constantly evolving to engage with global ageing factors.

The AAI has sought to operationalise the WHO's definitions of active and healthy ageing into an accessible set of metrics that maximises country take-up and supports the development of a more complete set of international information around ageing. The four domains on which the AAI collects information are: employment; participation in society; independent, healthy and secure living; and capacity and enabling environment for active ageing. The population of these domains by different indicators is shown in Figure 1.

In designing these domains and selecting meaningful indicators with which to populate categories, as well as in assigning different weights to indicators, advice was sought from a specially formed AAI Expert Group. This included academics, statisticians and pan-European organisations such as the OECD, Eurostat, European Commission, and the United Nations Economic Commission for Europe (UNECE). The consultative process has ensured that both analytical rigour and policy relevance were key driving forces.

One of the advantages that the AAI offers is the development of a composite index that enables countries to more easily identify policy priorities, progress and challenges, as well as to break this down by substantive areas. There is also relatively good alignment between the substantive areas of interest of the AAI and the MIPAA monitoring, with the AAI having undergone reiterations to ensure that data is accessible and easily-collatable by countries, to maximise the likelihood of meaningful indexes being collected.

Figure 1: Domains and indicators of the Active Ageing Index "AAI"



Source: *Zaidi and Stanton (2015), p13.*

However, taking a broader perspective on global progress, data collection around the MIPAA has been extremely variable between countries (Parry and Zaidi, 2018, regional reports 1-5). This makes the work of the UN regions challenging in drawing comparisons on progress and hinders the degree of international assessment that can be made on policy progress around ageing. A lack of age-disaggregated data was noted as a deficit in the data collected for the MIPAA, and in our analysis of the regional progress around the MIPAA (Parry and Zaidi, 2018). There is a compelling case then for learning to be applied from the AAI around more functional and sustainable ways of monitoring progress on ageing (Zaidi *et al*., 2018).

Chapter 2: The AAI and active ageing strategies

2.1 Potential of the AAI for active ageing strategies

In formulating policies for active and healthy ageing, governments are engaged in many different policy areas, not exclusively about fostering employment, but also about promoting social participation and engagement, increasing financial security, improving health and well-being, and lifelong learning, and developing enabling environments. For these strategies to succeed, the building blocks of the multidimensional aspects of active and healthy ageing need to be supported by credible evidence, convincing not only policymakers but also the public about the suitability of the policies proposed. While at times such policies focus on specific goals, they must also be cast within a global multi-perspective approach that addresses all positive aspects of the lives of older persons. Most of these dimensions are brought together in the AAI project, launched during the 2012, the European Year for Active Ageing and Solidarity between Generations, already in use for more than five years by several policymaking communities across EU countries.

The value of evidence-based policymaking depends on the quality and robustness of the available data. Drawing on the example of the AAI, we argue that the AAI serves well as an analytical or diagnostic tool for a wide range of stakeholders (policymakers, researchers, students, businesses). It provides an opportunity for a collaboration between European countries and China through the sharing of best practices and policy learning, and by identifying innovative social policy practices and contexts through comparative analysis.

Since the AAI is based on outcome indicators rather than 'process' indicators or descriptive information about institutional arrangements, the focus is on experiences of active and healthy ageing among current cohorts of older persons (mostly referring to those aged 55 and older), rather than how the outcomes have been achieved through processes. This follow-up step requires further scrutinising of the AAI results and policies and institutions responsible in a single country, as has been undertaken in the Mobilising the Potential of Active Ageing (MoPAct) project of the European Commission.

The AAI offers opportunities for advancement in several aspects. Firstly, it highlights the multidimensional characteristics of the active ageing phenomenon by including market and non-market contributions of older persons to society. Secondly, through the introduction of a domain capturing the capacity and enabling environment (the 4th domain on Figure 1), it includes consideration of human and social capital as well, as the supportive capacity required to experience active ageing. Thirdly, it provides internationally comparable evidence on the relative position of European countries with respect to the untapped potential of older persons in various aspects of active and healthy ageing. Such evidence can be a very valuable aspect of the AAI, when the ranking is used as a benchmark for countries and an incentive to look at policies that other countries have adopted. The Index thereby provides a unique opportunity for cross-country comparison, leading to the sharing of best practice and policy learning.

2.2 Role of the AAI in formulating active ageing strategies in EU countries

The AAI has been gaining recognition as a policymaking tool and is making a credible contribution to the discussion about how best to measure and promote active and healthy ageing in European countries. Several countries, including Poland, Bulgaria, Latvia, Estonia, Malta and Slovenia, have been using the AAI to develop or adapt their active ageing strategies. The AAI toolkit shows them where they have low scores and what might be their priorities, although it does not show them how to remedy the situation.

In Malta, for example, the results of the AAI have been widely discussed by national policymakers and experts. This debate has led to the development of the National Strategic Policy for Active Ageing: Malta 2014–2020. The Maltese strategy follows the distinct domains introduced by the AAI and forms policy recommendations specifically for three of them: Employment, Participation in society and Independent living. A dedicated unit within the Maltese Government has been set up to implement this policy (Karpinska and Dykstra, 2015).

In Slovenia, the AAI as a policy tool has also gained wide recognition as it has been applied to guide the adoption of the new comprehensive long-term Active and Healthy Ageing Strategy in Slovenia (AHA.SI). The AHA.SI emphasises three areas of interest: Employability and employment, Active and healthy ageing, and Assisted and independent living and long-term care. The initiatives that have been undertaken so far have focussed on a single aspect of active ageing, for instance, employment or care (Karpinska and Dykstra, 2015).

In the Czech Republic, extensive work has been carried out to link AAI indicators with the Strategy of Social Inclusion 2014–2020 within the Europe 2020 Framework; this has involved more than 20 strategic documents, including the National Action Plan for Positive Ageing 2013– 2017 (ibid).

In Poland, the Government designed and promoted programmes to boost the contribution and potential of older persons; this was directly linked to the country's low AAI score (Breza and Perek-Białas, 2014). Also, Poland's 16 regional governments are responsible for many aspects of the various policies on seniors and active ageing.

2.3 Relationship between AAI data collection and development of ageing policy

Reviews of the use of the AAI suggest that governance of active ageing strategies is a major concern. Many countries lack the nation-wide initiatives needed to coordinate the efforts of the different ministries and local level administrations involved. Scrutiny of the underlying conditions in European countries displaying higher rates of active ageing for the older population can assist policymakers at EU, national, regional and local levels wanting to develop joined-up policies and programmes to encourage active ageing.

The added value of the AAI is that it encourages policymakers to look at active ageing in a comprehensive way. It offers a broader perspective on the different dimensions of the contribution and potential of older persons. In doing so, it helps policymakers and other stakeholders understand where they could do better compared to other countries and set themselves goals for a higher and more balanced form of active ageing. The monitoring over time of policy achievements through a

metric such as the AAI can also help identify innovative social policies and contexts offering opportunities for mutual learning.

The policy efforts suggested by the AAI are multifaceted: not only do they encompass improvements in labour market outcomes, but they also incentivise social participation and independent living, generate higher capacity and create an enabling environment for active ageing.

Assessing such a complex and diversified phenomenon as active and healthy ageing through a single composite indicator has its limitations.

- The AAI indicators and its domain-specific indices have used the data currently available, however inadequate they might be. More detailed comparative data will be required, for example, to allow analysts to distinguish between levels of education, health status and age cohorts, and to enable more robust cross-country comparisons.
- The AAI focusses exclusively on the current generation of older persons; its predictive value could be developed by emphasising the life course in the design and use of the indicators.
- The wellbeing of older persons could also become the focus of active ageing strategies, which will require a more careful selection of the AAI indicators with the normative judgement for each indicator.

Further development of the tool would make it possible to show how some countries are dealing more effectively with inequality in ageing, for example, between better educated and less educated older persons, or between those with good health and poor health.

Further research will help us address the question: How can the benefits of a comprehensive strategy be made available to all on an equal basis? Or more specifically: What active ageing policies are required for those who have physical and mental limitations?

By stimulating the debate on how best to measure active and healthy ageing, the AAI has helped raise awareness of the needs and challenges involved in enabling older persons to fulfil their potential by contributing to their own welfare as well as to that of their societies. The broad consensus is that the AAI is a potentially useful tool for monitoring progress and identifying areas where additional policies are required. However, to make the best use of it, further investment needs to be made in generating good quality data and in maintaining the flexibility of the Index, to cope with differences across nations, as well as subnational differences within countries.

2.4 Complementary approaches and frameworks

Alternative approaches that have been adopted in monitoring the MIPAA include the MA: IMI project the Macao Index and the Global AgeWatch Index.

- The Mainstreaming Ageing: Indicators to Monitor Implementation (MA:IMI) project was developed in the European context by the European Centre Vienna and developed a set of core indicators to be utilised by member states in implementing the MIPAA (Marin and Zaidi, 2007). Utilising data that was readily-available, these focused around: demography; income and wealth; labour market participation; and social protection and financial security. These

provided some alignment with the MIPAA indicators, although less so than the AAI (Zaidi *et al.*, 2018).

- The Macao Ageing Index, developed in the Asia-Pacific region to reflect its interests as the world's fastest-ageing region and to complement the Shanghai Implementation Strategy, measures policy progress around key areas of: older persons and development; health and well-being; enabling and supportive environments; and implementation and monitoring activity. Again, there is intentionally broad overlap with the MIPAA, a little less so than the AAI, and with the Macao Index placing more emphasis on regional and international cooperation, community support, and regional ageing mechanisms (Parry *et al.*, 2018).
- The global evidence on well-being of older people is also provided by the Global AgeWatch Index (GAWI). Since its launch in October 2013, it has served as a tool aimed at delivering insights on well-being of ageing population across the world (Zaidi, 2013). It uses an international database put together by the United Nations Department of Economic and Social Affairs (UNDESA), the World Bank, the World Health Organisation, International Labour Organisation, the United Nations Educational, Scientific and Cultural Organisation (UNESCO), and the Gallup World Poll. The Global AgeWatch Index is a composite measure, developed along the lines of the Active Ageing Index, using the methodology like the Human Development Index (HDI) of the United Nations Development Programme (United Nations, 1990). The GAWI comprises 13 indicators grouped in four domains: 1) Income security (with indicators on pension income coverage, poverty rate in old age, relative welfare of older people, gross domestic product (GDP) per capita); 2) Health status (life expectancy at 60, healthy life expectancy at 60, and psychological wellbeing); 3) Capability (employment rate among people aged 55-64, and share of older people with at least secondary education); and 4) Enabling environment (social connections, physical safety, civic freedom, and access to public transport).

Chapter 3: Utility of the AAI as a monitoring and comparative instrument for China

3.1 Ageing context in the Asia-Pacific region

The Asia-Pacific region is currently characterised by accelerated population ageing, more rapid than that experienced in OECD countries. Its older population is anticipated to double by 2050 (UNESCAP, 2017), and it currently contains 60% of the world's older population, with the largest proportions of these concentrated in China (229 million), India (126m), and Japan (43m). Ageing is also a gendered phenomenon in the region, with 60% of those over 80 being women. While the 'oldest old' (aged 80+) made up 1.5% of the region's population in 2015, this is predicted to rise rapidly to 5% by 2020, amid regional variation. For example, in Japan, which currently leads the world on life expectancy, the over 80s already constitute a quarter of the population. This kind of demography presents certain policy challenges around service provision. Additionally, since retirement age in the Asia-Pacific region is relatively low, it can be expected that rapid ageing will prolong older persons' dependency, particularly in countries where social protection coverage is more limited, placing financial pressures on families. The region also includes some of the world's fastest-growing economies and is playing a key role in global poverty reduction, the proportion of the population living in extreme poverty having fallen from 29.7% in 2000 to 10.3% in 2013. Notwithstanding such trends, poverty remains an ongoing concern, with 400m persons in the region living in extreme poverty, and women and older persons having a heightened risk of deprivation (UNESCAP, 2017).

The region also contains some dramatically varied experiences of ageing, reflecting countries' different stages in demographic transition, highly divergent levels of economic development and wealth, and diverse policy and practice readiness to respond to the challenge of ageing. While countries like Japan, South Korea and Australia have relatively high life expectancies (over 80), in Afghanistan, Pakistan and India this is still in 60s (UNESCAP, 2017). With rising life expectancies, so too disability-adjusted life years have become stretched, and women have notably higher levels of disability in old age in the region.

These demographic changes raise concerns around quality of life in later life, with implications for countries' health and social care infrastructures. In terms of existing health challenges, the Asia-Pacific region currently has some of the world's highest rates of non-communicable diseases (NCDs), and furthermore, incidence of communicable diseases such as tuberculosis and malaria is heighted by poverty, with older persons at increased risk of infection. With universal free healthcare access limited in the region, these trends are directing high levels of unmet need. On the other hand, certain regional resources are more developed than in other UN regions, such as the Asia-Pacific's abundance of older persons' associations that have played a key role in promoting social solidarity, countering loneliness, and encouraging participation in public life. Furthermore, at the same time as the region is experiencing raised levels of care need in later life, outmigration of care workers is now such that a shortage of qualified care workers has become established (UNESCAP, 2017).

3.2 Characteristics of ageing in China

China has the world's largest older population and contains 40% of older persons in the Asia-Pacific region (UN Population Division, 2017). It is also a country experiencing rapid ageing, particularly of its oldest old. The pace of ageing also should be considered in the context of broader population demographics; China is currently at a point of key shift, from seeing the greatest growth in its working age population, to now looking towards a period when its aged population will increase more rapidly while its labour force contracts. This is exacerbated by relatively the low statutory pension ages of 50-55 for women and 55-60 for men (sector-dependent). The literature is mixed on whether China should be classified as a developed or developing country. Officially classified by the World Bank and IMF as developing with its high rates of poverty, and self-identifying in this way, it also presents high levels of literacy, a characteristic more often associated with developed countries. UNDP classify China as a middle-income country, which raises challenges given that its pace of ageing looks set to approach that of higher-income countries, and at present 24% of older persons live below the poverty line (2016), although simultaneously overall poverty has reduced from 67 to 1.9% over the period 2000-2013 (UNESCAP, 2017).

An important driver of population ageing in China has been the one-child policy of 1979-2016, which is associated with a significant period of fertility decline, with lasting effects on the country's demography. In fact, one child policy has not led to the fertility decline; since the majority of academics think that even without one-child policy, there will be a decline in fertility. This falling fertility coincided with the broader global trend of expended life expectancy which has accompanied advances in healthcare, currently standing at over 80 in China (UNESCAP, 2017). Consequently, a situation has evolved where China's fertility transition is disrupting traditional expectations regarding family care in later life that were underpinned by filial piety (Xiong and Winiowski, 2018), as it has shifted from a multi-generational society to a 'four-two-one' family model. Consequently, pressure has intensified upon younger generations, further complicated by sex ratio imbalances driven by the one-child policy and informed by low social old-age insurance coverage. Policy responses to this have included the provision of financial incentives to family to provide care for older persons, and legislation on older persons' family care (UNESCAP, 2017). Key issues for China in future years will be to extend working lives and tackle pension reform.

Since 1990s, ageing has been placed in the priority of national policies. For example, China maintains a dedicated coordinating body on ageing: China's National Committee on Ageing (dating from 1999). An important response from China to its ageing challenge has been to work towards ensuring that social pensions offer protection to older persons in informal work, who would otherwise be under pressure to carry on working to maintain income in later life.

In comparison, South Korea is currently witnessing significant gains around ageing; it is anticipated that the country will see the world's fastest-growing proportion of older persons over the period 2015-2030 (UN Population Division, 2017). By 2030 Korean women are expected to outlive Japanese women (Kontis *et al.*, 2017), with a high probability of achieving a life expectancy over 90 (Kontis *et al.*, 2017; Parr *et.al.*, 2016). These rapid gains can be attributed to healthcare improvements across socio-economic status in South Korea, and to reduced health inequalities among women, underpinned by an early introduction of universal social health insurance. Current levels of the

oldest old at 15% in the Republic of Korea are expected to rise to 34% by 2050 (UNESCAP, 2017). Notwithstanding these gains in longevity, quality of life in later life remains an issue, with 48% of older persons in the Republic of Korea living below the OECD poverty line, compared to a general population rate of 10% (UNESECAP, 2017), a discrepancy linked to low pension coverage. The 2014 pensions reforms have set out to universalise basic pensions.

3.3 Strengths and weakness of country-level data

While the Madrid Plan International Plan of Action on Ageing (MIPAA) has provided global coordination around data collection on ageing, the Economic and Social Commission for Asia and the Pacific (UNESCAP) Regional Implementation Strategy (RIS) provides key geographical refinement and direction. In the Asia-Pacific UN region, the 1999 Shanghai Implementation Strategy (SIS) – like the MIPAA - has prioritised development, health and well-being, and enabling and supportive environments, as key elements for supporting ageing societies, but has also underlined the importance of implementation and monitoring activity as a distinctive area for policy action. 16 action areas and 156 metrics were identified in Macao Index developed to complement the SIS and to measure policy progress around ageing in the region (Chan *et al.*, 2010).

Our recent work for the UNFPA (Parry and Zaidi, 2018, report 1) indicated that progress across the Asia-Pacific region on the MIPAA's three key priority areas has been slow. Notably social protection programmes have uneven coverage, particularly in countries with extreme poverty, and women are most vulnerable to lacking protection. Reponses to older persons' needs in emergency planning had also been *ad* hoc and uncoordinated, a concern given the history of natural disasters in the Pacific area. Access to free healthcare was limited across the region, with a noted shortage of mental health services for older persons, and the existence of geriatric facilities was limited to higher-income countries.

We have also examined the availability of nationally representative surveys in the Asia-Pacific region to evaluate their capacity around data collection on ageing, and how this will position them in terms of being able to calculate the AAI (Zaidi *et al.,* 2018). We analysed the datasets of 14 Asia-Pacific countries: Australia, Bangladesh, Cambodia, China, India, Indonesia, Japan, South Korea, Malaysia, Myanmar, New Zealand, the Philippines, Thailand, and Vietnam. These represented countries with relatively well-developed data-collection processes in the region.

China's current data collection resources around ageing are relatively advanced in the Asia-Pacific region, conducting regular labour force surveys and population censuses, in addition to some more specialised surveys: The Study on Global Ageing and Health (SAGE), the China Health and Retirement Longitudinal Study (CHARLS) (3 sweeps), China Longitudinal Aging Social Survey (CLASS), and the Chinese Longitudinal Healthy Longevity Survey (CLHLS) (6 sweeps). Its labour force survey includes data collection on older workers.

3.4 Proposing refinement of a dashboard of indicators

In response to markedly varied reporting and monitoring mechanisms at national levels, which have limited the impact and utility of the Madrid International Plan of Action on Ageing, we have argued previously (Sidorenko and Zaidi, 2018; Zaidi *et al*., 2018) that a new approach be taken to data

collection around ageing. We have specifically considered the feasibility of extending and applying this tool in the Asia-Pacific region (Zaidi *et al*., 2018; Parry *et al.*, 2018) and in China (Du *et al.* 2016). Rapidly ageing regions like the Asia-Pacific have the most to gain from developing more accurate and meaningful age-disaggregated data to support their policy responses to the challenge ahead.

Our starting point, the Active Ageing Index (AAI), provides a dashboard of indicators aligned with the MIPAA's three policy directions, enabling domain-specific indexes to be developed, as well as aggregated into a composite index to provide accessible benchmarking and monitoring of national progress. This has been successfully tested in European countries (Zaidi and Stanton, 2015; Zaidi *et al.*, 2017) and was more recently extended outside the EU. A country of China's size with diverse regional circumstances would have much to gain in adopting a framework that provides a functional set of metrics that could be applied to policy and practice around ageing, given mechanisms already in place around data collection. For example, it would enable the impact of initiatives to be evaluated and improved, and the framework could be used to identify areas for improvement and gaps in existing provision.

Refinement of data monitoring processes should build on the more successful aspects of the MIPAA, AAI and Macao frameworks that have already been identified and push forward the commitment to accessible and constructive data monitoring. Furthermore, in the context of the growing momentum of the sustainable development agenda, there is heightened impetus to synchronise and reform data monitoring mechanisms with the Sustainable Development Goals. These offer a unique opportunity to ensure that older persons are positioned at the heart of policy progress around poverty, gender equality, decent work, inclusive spaces, and climate change. The quantification of monitoring processes around ageing also provides the potential to support variation between regions, an aspect with utility in countries with diverse regional circumstances like China, where it will be able to ensure that ageing policy reflects these nuances and different demands.

We have previously compared data collected by the MIPAA, AAI and Macao Ageing Indexes (Parry *et al.*, 2018) and have noted areas where there are convergences as well as gaps, in indicating how a more functional framework would be developed. Data collection gaps were noted in the Asia-Pacific region around: rural development, access to knowledge, education and training; social connectedness; emergency situation; physical exercise; and training of care and health professionals. By contrast, the Macao Index has led international data collection on ageing around social services and community support, regional ageing mechanisms, and regional and international cooperation. Discrepancies between the different monitoring systems on the type of information being collected complicate cross-national comparisons and underpin the need for refining monitoring systems to provide globally meaningful and accessible frameworks. These provide valuable grounding, developed later in this report, for how a simplified and achievable framework for ageing data can be established at a country-level in China to support the challenges it faces in responding to a rapidly ageing demographic.

Chapter 4: Collection of the AAI indicators for China

4.1 Feasibility of building up the AAI in a non-European context for China

As mentioned in Chapter 1 of this report, the World Health Organisation promoted active ageing as a strategy to call for policy responses that consider older persons actively engaged so as to continue participate in economic and social life, as a way of promoting heathy life and good quality of life, and also as a means of responding to societal challenges faced by countries experiencing population ageing (WHO, 2002).

Active ageing has been embedded in both Chinese culture and policies. Traditionally older persons are considered ageing well if they are supported by their children, and especially the younger generation widely. In contemporary China, active ageing has become more important than merely receiving care and support. The six "must haves" are laoyousuoyang(老有所养)、laoyousuoyi(老有所医)、laoyousuowei(老有所为)、laoyousuowei(老有所学)、laoyousuole(老有所乐)、laoyousuojiao(老有所教). In English, these mean that older persons have the right to receive material support, health care, social participation, continuing education, leisure or happiness, and teaching.

These "must haves" have been highlighted in the most recent *Elder Protection Law* (Shea, 2018). Accordingly, they become the guidelines in other national ageing policy areas, such as the social security system, medical and healthcare system, social services system, lifelong learning and teaching programmes, social participation and development programmes, and legal system (Mui, 2010). There is thus usefulness in constructing a composite measure (an index) of active ageing that reflects on cultural and political contexts.

There is a lack of a useful policy-making tool for identifying the priorities in active ageing policies in China. Active ageing should be measured by a multi-dimensional scale and this scale should not only be continuous, but also multifaceted. The AAI is an index that examines different domains, which can be applied in the Chinese context. The active ageing index (AAI) has been a tool for policy-makers to compile data collected via social surveys, and to provide a reference point in decision-making in European countries in order to monitor the implementation of national ageing-related policies in the context of the Madrid International Plan of Action on Ageing (MIPAA) (Zaidi, 2015).

To reiterate, the AAI comprises four domains (i.e. employment, participation in society, independent, healthy and secure living and capacity and enabling environment for active ageing, which were separately measured by 22 indicators sourced from major European household surveys (Zaidi et al. 2013). The Index should be interpreted with great caution. It should not be interpreted by the higher being the better, as it is constructed in a way that with a theoretical value of 100, but in actuality, a score of 100 will never be reached (Zaidi 2015). It is thus recommended that AAI be interpreted with comparison to a goalpost value, which in the case of the EU reports of AAI was the average (Zaidi et al. 2013).

4.2 Existing data sources for China – comparable mechanisms and unique resources;

One of the challenges to monitoring the progress of active ageing is that it is impossible to have a single source of dataset that covers all the indicators. In this report, we have used secondary data from surveys and statistics reported by international organisations and published articles by other researchers. Many social surveys have been implemented in the last 10 years in China, which provide reliable data for understanding Chinese society. All the surveys are led by academic institutions, which have used credible scientific approaches in designing questionnaires, sampling, collecting, cleaning and managing data. The surveys collect data that range from general social life, to family life, and the health and retirement life of the older population. Data are usually made available to researchers in the time frame of one or two years after the data collection work is completed. The availability of data provides an opportunity for constructing the AAI, for China and for other Asia-Pacific countries alike (Parry *et al.,* 2018).

The family of health and retirement surveys were recognised as the most comprehensive ones for the purpose of calculating the active ageing index (AAI), with complementary information from labour force and household surveys, and national censuses (Zaidi *et al*., 2018). Below is a brief introduction to four surveys, including the health and retirement survey, which have been used in this report to construct the AAI for China.

4.2.1 China Health and Retirement Longitudinal Study (CHARLS)

CHARLS is a biennial multistage longitudinal survey of the middle aged and older population led by Peking University, China since 2010. It has similar questionnaire design in comparison to other surveys to study ageing populations, such as the Health and Retirement Study (HRS) in the US, English Longitudinal Study of Ageing (ELSA) and the Survey of Health, Ageing and Retirement in Europe (SHARE). CHARLS covers topics on: demographics; family structure and family relationships; health status and functioning; biomarkers; health care and insurance; work, retirement and pension; income and consumption; assets (individual and household); and community level information. More details can be found at: http://charls.pku.edu.cn/en.

4.2.2 China Family Panel Studies (CFPS)

CFPS is a biennial nationally representative longitudinal survey of communities, families, and individuals also led by Peking University, China since 2010. CFPS collects individual-, family-, and community-level longitudinal data. The studies focus on the economic, as well as the non-economic, wellbeing of the Chinese population, with a wealth of information covering such topics as economic activities, education outcomes, family dynamics and relationships, migration, and health. More details can be found at: http://www.isss.pku.edu.cn/cfps/EN/.

4.2.3 China General Social Survey (CGSS)

CGSS is a national representative cross-sectional study of social change led by multiple Chinese academic institutions. The survey collects information on family and household, and demographic and socioeconomic status of individuals, health and work, quality of life and well-being, attitudes and behaviours towards religion, social inequality, gender roles and environment. The aim is to

reflect on social changes in transitional China in recent years. Data were collected since 2003 annually. More details can be found at: http://www.chinagss.org/index.php?r=index/index .

4.2.4 Chinese Household Income Project (CHIP)

The Chinese Household Income Project (CHIP) currently consists of five waves of surveys, conducted in 1989, 1996, 2003, 2008, and 2014. The focus of CHIP is on income and inequality. The data is managed by the Chinese Academy of Social Sciences, with cooperation from the National Bureau of Statistics of China. The survey was initiated in 1988, and four more waves of cross-sectional surveys have been conducted since. The 5th wave was conducted in July and August in 2014. Since it contains the income and expenditure information of 2013, the 2014 wave it is known as CHIP 2013. The 5th wave was conducted by the Annual Household Survey Office of Integration of Urban and Rural Residents in the National Bureau of Statistics (NBS). The original data of 2013 CHIP contains three subsamples: urban, rural, and migrant. The sample contains 18,948 households (7,175 urban households, 11,013 rural households, and 760 migrant households) and 64,777 individuals. More details can be found at: http://ciid.bnu.edu.cn/chip/index.asp?lang=EN

4.3 Description of AAI indicators in China

To construct the AAI for China, we have mostly employed variables from the most recent surveys of the four datasets described above (the CHARLS 2015, the CFPS 2016, the CGSS 2014, and CHIP 2013), combined with information drawn from databases from international organisations (WHO and UN). We then validate the results using data reported by OECD and ILO and research papers. Survey questions relevant to the specific domains and indicators were carefully scrutinised. CHARLS have been used as the priority survey data source, which was suggested by Zaidi *et al.* (2018) in their review of data sources on active ageing in Asia-Pacific countries. Where there was not identical measurements in CHARLS as in the EU AAI work, the CFPS, the CGSS and the CHIP were used to supplement variable construction. Table included in Annex A1 details definitions, survey questions, sources, and comparability with the EU AAI, which are explained below.

4.3.1 First domain: Employment

Employment means undertaking any paid job for at least one hour last week, or being involved in agricultural work or having a job but not being working the last week due to temporarily being laid-off, or on sick or other leave, or on in-job training. The measures are consistent with the International Labour Organisation (ILO) definition of employment in the ILO database.

Employment rates of four age groups consists of the four indicators of the AAI employment domain:

1.1 Employment rate for the age group 55-59
1.2 Employment rate for the age group 60-64
1.3 Employment rate for the age group 65-69
1.4 Employment rate for the age group 70-74

The definition of employment is comparable to the EU AAI one of work, except that in China, agricultural work is considered as work, while the EU AAI uses the Labour Force Survey (EU-LFS) and is not explicit about covering this item of work.

4.3.2 Second domain: Social participation

The measures for the second domain, social participation, and its relationship to the population aged 55 and over are drawn from CHARLS and CFPS.

Participation in voluntary activities is measured by the percentage of older population aged 55 or above who provide unpaid voluntary and participate in community activities. Data was derived from CHARLS 2015 on voluntary activities, such as providing help to others, participating in social events, sports and community-related organisation, and volunteering charity work. In the EU AAI work, the European Quality of Life Survey (EQLS) was utilised, which included (at least once a week) any voluntary activities that took place via organisations, including through community and social services, educational, cultural, sports or social professional associations, or involvement in charities or social movements.

The CFPS was used to extract data on care provided to children and grandchildren. Care provision to children and grandchildren was measured through the percentage of the older population aged 55+ providing help with housework for their children or taking care of their grandchildren at least 1-2 days a week in the past 6 months. In comparison to the questions in the EQLS, the CFPS specifically asks about housework, which is considered as care to adult children, and grandparental care.

The CHARLS 2013 data was used to calculate care provision to older adults. Providing care to older adults and disabled relatives is specified as including parents or parents-in-law of older persons in China, rather than the older adults or disabled relatives identified in the EU calculation. Thus, we derived our data from the variable “take care of your parents / parents-in-law” and “cared for a sick or disabled adult who does not live with you” from the CHARLS 2013. At least 1-2 days a week is used as the minimum threshold for care provision.

The last dimension of social participation and relationships is political participation, which is defined as taking part in activities that influence decision making in organisations. This might include: attending a meeting of a trade union, a political party or political action group; joining a protest or demonstration; and contacting a politician or public official (other than routine contact arising from use of public services). Participation in political activities is not common in China, so this type of data is not available. The weight of political participation has been assigned equally to other indicators in the second domain.

4.3.3 Third domain: Independent, healthy and secure living

Physical exercise is measured by the percentage of people aged 55+ who undertake vigorous activities (including heavy lifting, digging, plowing, aerobics, fast bicycling, and cycling with a heavy load), moderate physical activities (including moving stuff, cycling, mopping the floor, Taichi, and jogging) and any type of working (e.g. travelling from place to place, recreation, sport, exercise or leisure) for at least 10 minutes at a time, for at least five days during a week. The EU AAI used the EQLS on this indicator, which only asks about sports or physical exercises, but does not provide in-depth information about the type of exercise pursued, or how many days per week have been undertaken. In CHARLS, at least five days per week is chosen as equivalent to “almost everyday” in the EQLS.

Access to health care means no unmet need in AAI. It is measured by the percentage of people aged 55+ who reported that they had accessed health care when ill, or who had not accessed health care but this is not due to poor delivery or provision of care (e.g. a lack of money or time, poor transportation, or poor health service), during the last month in China. Data were extracted from CHARLS, which did not ask about unmet need in dental care. The EU AAI used European Union Statistics on Income and Living Conditions (EU-SILC) that asked about medical and dental treatment received over the last 12 months.

Independent living arrangements are defined as the percentage of older persons who are living with their spouse only, or alone. The data were extracted from CHARLS. This is comparable to the EU AAI definition.

Two indicators, relative median income and no poverty risk, are related to secure living. The total household annual income variable (including urban, rural, and migrant household income) from the CHIP 2013 was used to derive the ratio of the median equivalised disposable income of people aged 65 and above to that of those aged below 65. The data for 'no poverty risk' was also derived from the CHIP 2013, and the poverty rate is calculated using the 50% of the national median equivalised disposable income. Older people aged 65 or above who are not at risk of poverty is defined as those with an equivalised disposable income above the poverty threshold.

Material deprivation is defined as not having at least four out of a specified nine household essentials at home: cooking set, fridge, freezer, washing machine, dryer, television set, water boiler, warm up equipment, and air conditioner. Air conditioners are not covered in the EU AAI but are an important item for hot summers in China. The data on these items were derived from the CGSS. However, it is not known if not these items having was because people were unable to afford them, or if it was their choice not to purchase these items. In addition, in the EU AAI work, material deprivation includes the affordability of rent, mortgage or utility bills, unexpected expenses, and holidays, but these data are not covered in Chinese datasets. Cultural and structural differences can explain this lack of direct comparability.

Physical safety is measured by the percentage of older persons aged 55+ who felt very safe or safe in their local area in the CGSS. This definition was almost identical to that used in the European Social Survey (ESS), which was used in the EU AAI.

Finally, lifelong learning is defined as the percentage of older persons aged 55 to 74 who attended an educational or training course during last month using CGSS data. This definition is almost the same as that used in the EU Labour Force Survey (EU-LFS) used to calculate the AAI, which asked if the person has received education or training in the four weeks preceding the survey.

4.3.4 Fourth domain: Capacity and enabling environment for active ageing

The remaining life expectancy (RLE) achievement of 45 years at age 60 is the ratio of RLE at age 60 to 45, which indicates the achievement in the target of 105 years. Data of RLE and Healthy Life Expectancy (HLE) were obtained from the United Nations database and WHO Global Health Observatory respectively. The age 60 is chosen because the RLE and HLE at age 55 (which were used

in EU AAI) are not available from existing data sources. The share of healthy life years in the RLE at age 60 is the proportion of healthy life expectancy at age 60 to RLE at age 60.

Mental well-being is measured by the percentage of older persons aged 55+ who have good mental well-being. Mental well-being is measured by a revised 5-items scale, the Centre for Epidemiologic Studies Depression Scale (CES-D). These five items were chosen for being as close as possible to the WHO-5 measurement of mental well-being, which was utilised in the EU AAI. The range is from 5 to 20, so 12.5 was used to as the cut-off value in the score of mental well-being.

The use of ICT by older persons aged 55-74 is measured by the percentage of older persons who have used the Internet almost every week during last month. This compares to the EU AAI definition, except that 'within the last 3 months' was used in the EU AAI work.

Social connectedness is measured by the percentage of older persons aged 55+ who have interacted with friends, played Ma-jong, played chess, played cards, or went to a community club almost every week. The EU AAI used the ESS, which asked about social contact with friends, relatives or colleagues. Notably, CHARLS asked about the activities undertaken instead of the types of people with whom older persons interacted.

Educational attainment is measured by the percentage of older persons aged 55 to 74 who had completed at least high school, or those who obtained adult education degrees. Data were obtained from CGSS. The level of high school and above in China is equivalent to upper secondary or tertiary educational attainment in the EU AAI work.

Chapter 5: Construction of the AAI for China

The previous chapter has explained the feasibility, given existing data sources, and urgent need for building AAI in China. The applicability of the AAI needs careful consideration, as the definitions of indicators vary by surveys. Efforts have been made to derive indicators from existing datasets in China to ensure the consistency of measurements in comparison to the EU AAI work. This chapter presents these AAI results.

The calculation of AAI for China applies the same explicit weights for each indicator. The different explicit weights for indicators and domains were recommended by an Expert Group's consensus (see Chapter 1). The weighting method has explained in the work of Zaidi *et al.* (2013).

Table 1: Weights assigned to individual AAI indicators and domains for China

Indicators / Domains	Weight for an indicator (proportion within the domain)	Weight for a domain
1st domain: Employment	**100**	**35**
Employment rate 55-59	25	
Employment rate 60-64	25	
Employment rate 65-69	25	
Employment rate 70-74	25	
2nd domain: Social participation	**100**	**35**
Voluntary activities	31.7	
Care to children, grandchildren	31.7	
Care to older adults	36.7	
Political participation	-	
3rd domain: Independent, healthy and secure living	**100**	**10**
Physical exercise	10	
Access to health and dental care	20	
Independent living	20	
Relative median income	10	
No poverty risk	10	
No material deprivation	10	
Physical safety	10	
Lifelong learning	10	
4th domain: Capacity and enabling environment for active ageing	**100**	**20**
Remaining life expectancy of 50 at 55	33	
Share of healthy life expectancy at 55	23	
Mental well-being	17	
Use of ICT	7	
Social connectedness	13	
Educational attainment	7	

Source: Adapted version of the weights used in the EU AAI, reported in Zaidi and Stanton (2015).

We will next present the results of AAI for China, with comparison to South Korea and the average of all countries (including EU countries, China and South Korea). Using South Korea as a counterpart move one more step forward than the report of Zaidi *et al*. (2013), as South Korea and China share more common cultural background than China and the EU countries.

5.1 Results of the AAI for China

The following section reports the results of AAI of China (with disaggregation by sex), with comparison to South Korea (hereafter referred to as 'Korea') and the average of EU countries. Comparisons with both Asian and European counterparts would give a better picture of where China stands in terms of active ageing outcomes. Korea is provided as a point of comparison as another East Asian country, which is also currently experiencing significant gains around ageing.

5.1.1 The comparison of overall AAI index

The overall AAI score for China is 37.8, which is higher than that of Korea (35.4) and the EU average (33.9) (Table 2). If considered in the ranking together with Korea and 28 EU countries, China is 7th out of 30 countries. If the AAI was disaggregated by sex, the Chinese male population would rank 4th, and its female population would rank 9th. This gender difference existed in Korea and EU countries, especially in the Southern European countries (Zaidi *et a*l., 2017). There is thus a need for a greater examination of the AAI for female population, so that the gender differentiation in the active ageing experiences in China can be better understood.

The high ranking of China is mainly due to the high rate of labour force participation in China. If ranked by separate domains, China would rank 3rd in both sexes, 2nd in male population and 5th in female population. Even though the employment rate is lower for older age groups, in China, in the population aged 70-74, still about 34.2% of male population and 31.7% of female population are working. The other domains, 'social participation', 'independent, healthy and secure living' and 'the capacity and enabling environment' would rank 10th ,25th and 17th for both sexes, respectively.

The contribution of the four domains using the weights of the AAI calculations is presented in Figure 1 In China. The first domain employment contributes 37%, which is followed by the fourth domain, capacity and enabling environment for active ageing (28%), participation in society (18%), and healthy, secure and independent living (17%). They are different from the AAI composition for the average of EU countries, which has the largest contribution from capacity and enabling environment domain (32%), the second largest from employment (29%), the third from independent, healthy and secure living (21%), and the fourth from social participation (18%). The composition of China's AAI is similar to Korea's AAI; both have high levels of contribution from employment, but Korea's AAI has very low contribution from social participation and higher contribution from the capacity and enabling environment compared to China's AAI.

The next section will examine the specific domains and indicators listed in Table 2, which compares the results of China, Korea and the average of EU countries.

5.1.2 The comparison of the first domain: employment

The employment rate decreases with age in China, Korea and the average since age 55 (Table 2), which is to be expected since labour force participation is reduced around ageing. Even so, almost in every age group, the rate of employment is very high in China. The employment rate decreases from 73% in males aged 55-59 to 34.2% in males aged 70-74. For females, the employment rate decreases from 40.8% in age 55-59 to 18.8% in age 70-74. The difference in the employment rate is smaller in younger age groups than that in older age groups across the comparison groups. For example, the employment rate for males at age 55-59 is 73% in China, which is 13.5% lower than the 86.5% in Korea, and but still 3.7% higher than the 69.3% in the EU average. The employment rate for age group 70-74 is 34.2% for males in China, which is 2.2% lower than that in Korea but 26% higher than that in the EU average (8.2%).

5.1.3 The comparison of the second domain: social participation

Overall, China would rank 13th in social participation if compared to Korea and EU countries. The social participation index value for China is 18.3, which is 0.6 points higher than the EU average (17.7), but 14.3 points higher than Korea (4.0). The data for participation in political activities are not available in China. About 32.9% of older adults aged 55 and over provide care to children or grandchildren in China, much higher than that in Korea (5.0%), and similar to that in the average of EU countries (32.5%). About 13.4% of older adults aged 55 and over in China provide care to older parents, which is considerably higher than that in Korea (2.2%) but only slightly higher than that in the average of EU countries (12.9%).

5.1.4 The comparison of the third domain: independent, healthy and secure living

Older persons in China rank low in this domain (25th). There are high levels of physical exercises (99.1%) and no safety concern (91.9%) in older persons in China. The "no unmet medical treatment" score is much lower in China (68.5%) when comparing to Korea (94.1%) and the EU average (88.2%), which means that the access to or use of health care is low in China. Older persons in China also show very low levels of independent living (45.4%) compared to Korea (75.6%) and the EU average (84.2%). The relative median income ratio of China (87.1) is slightly higher than the EU average (86.3), but much higher than Korea (47.4). The scores of no poverty risk (71.1%) and material deprivation (71.1%) in China are higher than Korea, but much lower than the EU average, which means that poverty risk and material deprivation are lower in older persons in China than that in Korea, but higher than that in the EU. Older persons in China have an extremely low level of lifelong learning (0.5%), compared to 5.5% in lifelong learning in Korea and 4.5% in the average of EU.

5.1.5 The comparison of the fourth domain: capacity and enabling environment

In the domain of the capacity and enabling environment for active ageing in older people, China would rank 17th overall, and male 15th and female 19th. The ratio of remaining life expectancy of people aged 60+ to 45 years is higher than for Korea (53.3) and the average of EU countries (53.8). On the contrary, the share of healthy remaining life expectancy is much higher in older Chinese (82.1%) compared to 80.8% in older Koreans and 53.2% in the EU average. About 75.1% of older Chinese have good mental well-being, which is higher than that of older Koreans (50.7%) and that of the EU average (64.6%). The use of ICT in China is very low (3.9%), compared to 64.3% in Korea and 40.85 in the EU average. The level of social connectedness in China is 43.3%, which is lower than the

EU average (49%) and Korea (59.5%). Education attainment in China is much lower than in Korea and with reference to the EU average. Only about 21.6% of older Chinese have completed upper secondary or tertiary educational attainment, while 43% of older Koreans, and 59.7% of the EU average have done so.

Figure 1 Comparison in domain-specific contributions to AAI: China, Korea and the EU average

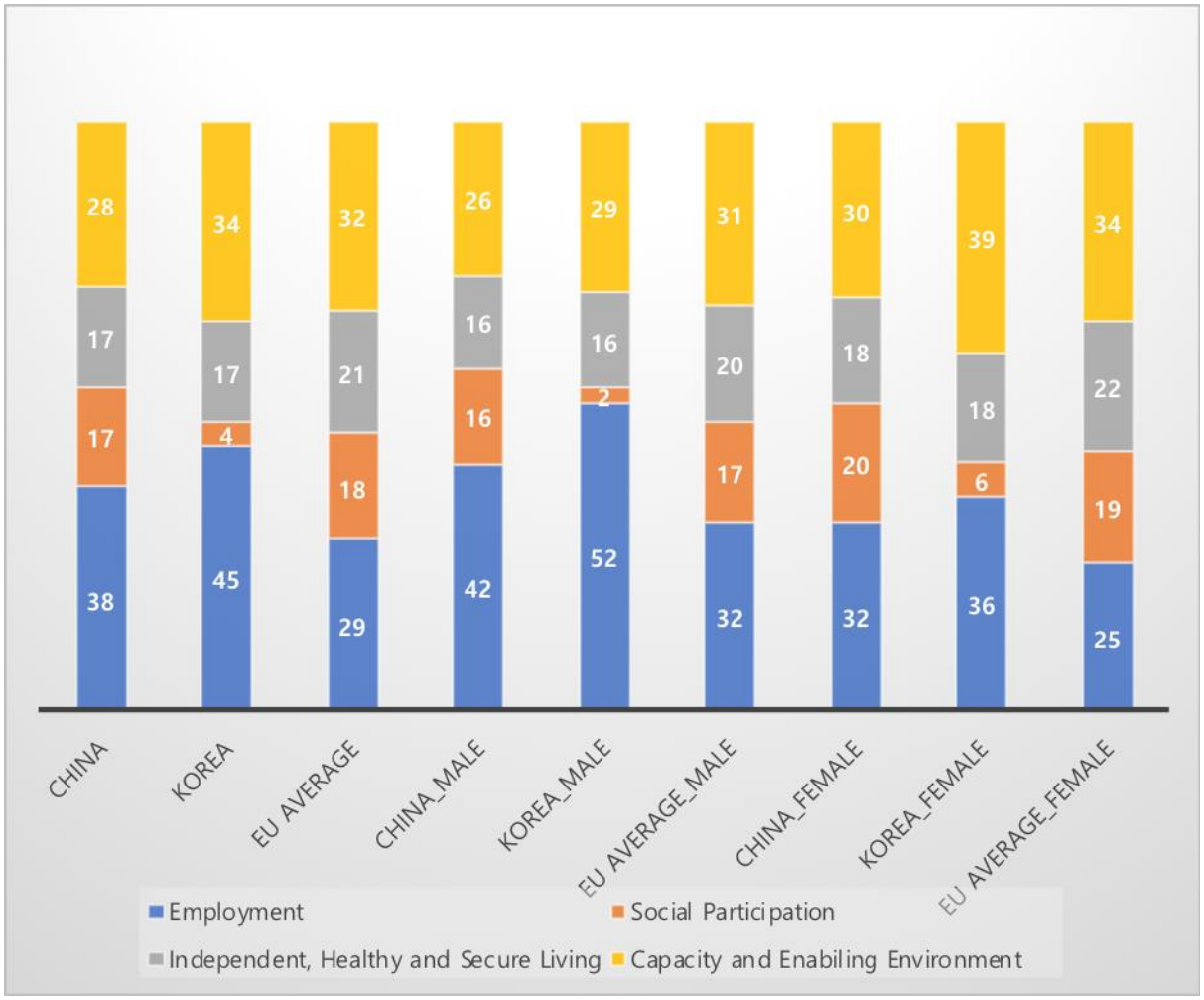


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Table 2: AAI index and domain-specific indictor scores of China, South Korea and the average of EU countries

		China			Korea			The EU Average		
		Both	Male	Female	Both	Male	Female	Both	Male	Female
AAI	**Index**	37.8	41.7	34.1	35.4	40.9	30.9	33.9	35.8	32.1
	Rank	7	6	9	11	6	19			
Employment	**1.1 Employment rate 55-59**	56.7	73.0	40.8	64.7	86.5	48.0	62.2	69.3	55.3
	1.2 Employment rate 60-64	44.7	53.3	36.9	51.9	71.2	36.2	31.6	38.6	25.1
	1.3 Employment rate 65-69	35.4	40.5	30.4	38.6	50.7	27.3	11.6	15.1	8.5
	1.4 Employment rate 70-74	26.0	34.2	18.8	25.5	36.4	17.4	6.1	8.2	4.3
	Index	40.7	50.2	31.7	45.2	61.2	32.2	27.9	32.8	23.3
	Rank	3	2	5	1	1	4			
Social participation	**2.1 Voluntary activities**	9.6	9.0	10.5	8.1	6.2	10.5	8.9	9.6	8.4
	2.2 Care to (grand) children	32.9	30.3	35.4	5.0	1.8	7.1	32.5	30.6	33.9
	2.3 Care to older adults	13.4	15.7	11.2	2.2	2.4	2.1	12.9	11.8	13.7
	2.4 Political participation	-	-	-	0.3	0.4	0.1	17.2	20.5	14.6
	Index	18.3	18.2	18.5	4.0	2.8	5.1	17.7	17.7	17.6
	Rank	13	14	10	30	30	30			

Independent, healthy and secure living	**3.1 Physical exercise**	99.1	98.9	99.3	32.1	37.0	28.4	15.6	16.0	15.2
	3.2 No unmet needs of health and dental care	68.5	72.1	64.7	94.1	94.7	93.6	88.2	88.6	87.8
	3.3 Independent living arrangement	45.4	52.4	38.6	75.6	78.6	73.8	84.2	84.2	84.2
	3.4 Relative median income	87.1	87.8	85.9	47.4	49.4	44.9	86.3	89.8	83.7
	3.5 No poverty risk	71.1	71.5	70.6	52.6	62.2	30.6	93.0	94.6	92.0
	3.6 No material deprivation	71.1	74.1	68.4	62.8	73.9	47.6	90.0	91.7	88.9
	3.7 Physical safety	91.9	92.5	91.4	71.2	81.4	64.5	69.3	78.0	61.8
	3.8 Lifelong learning	0.5	0.5	0.5	5.5	5.7	5.4	4.5	3.4	5.5
	Index	64.9	67.4	62.3	61.1	65.6	55.6	70.6	72.1	69.3
	Rank	25	23	26	29	28	30			
Capacity and enabling environment	**4.1 RLE achievement of 45 years at age 60**	42.2	46.7	40.0	53.3	46.7	60.0	53.8	48.8	58.1
	4.2 Share of healthy life years in the RLE at age 60	82.1	78.1	83.3	80.8	82.4	78.1	53.2	57.1	50.1
	4.3 Mental well-being	75.1	80.5	68.0	50.7	51.9	49.8	64.6	68.2	61.6
	4.4 Use of ICT	3.9	3.8	4.0	64.3	69.2	61.7	40.8	44.8	37.1
	4.5 Social connectedness	43.3	43.8	42.8	59.5	54.9	62.9	49.0	48.0	50.0
	4.6 Educational attainment	21.6	25.5	17.9	43.0	58.1	31.1	59.7	64.9	55.1
	Index	53.2	55.0	51.3	60.2	59.3	61.1	54.4	54.7	54.2
	Rank	17	15	19	8	8	5			

5.3 Discussion on harmonising data sources to produce AAI for China

The project has used the AAI as a tool to make comparisons between three regions. The AAI calculations using 22 indicators would not be possible without drawing upon various sources. Because of the complexity of the data requirement, there is no single source that can provide information for the 22 indicators. Therefore, we have used data from four surveys, namely, CHARLS, CFPS, CGSS, and CHIP in China, and WHO and UN.

The methods that we have adopted here of identifying some indicators in social surveys might not be consistent between regions due to data availability in various social contexts, which affects the results. The data availability decided that how we could operate the indicators. Indicators have been replicated as much as possible, but it is important to note that the meanings of some indicators might not be the same in China, as they are in Korea and in the EU AAI. For example, in the EU AAI calculations, measurements are taken on participation around political and trade union activities (e.g. attending a meeting of a trade union, a political party or political action group, a protest or demonstration, signing a petition, or contacting a politician or public official), which might influence the decision-making of organisations over the last 12 months. However, in the Chinese context, political activities are not encouraged, thus such a direct question is usually not asked in surveys. In another example, in the Chinese dataset, the calculation of the prevalence of care provision (to children, grandchildren or parents) was based on at least 1-2 days a week, but in the EU work used at least once a week. In this case, the time scale in China might have led to underestimating the prevalence of care provision to grandchildren, which explains the similar trends to the average of EU countries.

In the case of when secondary statistics are used, it would be useful to know how these were produced. The results show that although Chinese older people achieve lower in the remaining life expectancy (RLE), they are live much healthier as their share of health life expectancy (HLE) is higher than Korea older adults and the EU average. But the RLE and the HLE have used two different data resources, one from the United Nations and another from the WHO. It is important that additional information is provided on how mortality and health data are used to construct RLE and HLE calculations to make them even more comparable.

In addition, some measures in the AAI require careful examination, which could have used more information. For example, the index of independent living only looked at the living arrangements of older persons (whether co-residing with dependent children or not), but this measure ignores the fact that living in multi-generational households does not necessarily mean that older persons lose their independence. Older persons living with dependent children may support the younger generation by providing care, carrying out housework, and supporting in finances. Also, independent living might also be a preferred choice of living. The measure of material deprivation is similar to independent living as no material deprivation is defined by the possession of certain items, but it unknown why people do not own some items, which could be the choice of individuals.

Nevertheless, this report has filled in the gaps of the previous AAI exercise in China by drawing data from a wider source of surveys. 21 out of the 22 indicators (except political participation) of the AAI are identified and computed in China in the current report for the first time. This builds upon

previous work that entailed a calculation of the Chinese AAI index using only one single source of data, the China Health and Retirement Longitudinal Survey (Xiong and Wiśniowski, 2018), using similar methods to Zaidi *et al.* (2013).

5.4 Synthesising discussion on results

The Active Ageing Index measures older persons' contributions to the economy, society, and their families, but also accounts for their capacity and potential in different areas. Hence the evaluation of active ageing index results should also be multifaceted. The results of calculating the AAI in China, Korea and EU countries show that there are some domains that are better achieved than others, but the performance of one domain of AAI cannot be independent from others. In addition, it should be noted that this is based on aggregate data. The relationship drawn from this type of analysis does not imply individual behaviours. There is no expectation that individuals must achieve the maximum of every aspect of ageing, and this assumption has been explicit in the AAI.

Older populations in China have very high employment rates. The result of high employment rates in older age in China is also in ILO estimates in 2014, which estimated that the employment rate in age group 55-59 is 57.6%, and 49.4% in age group 60-64, and 21.2% in age group 65+. There is evidence of continued economic contribution from older people through agricultural work, re-employment, running one's own business, or in unpaid an family business, even though there is earlier retirement age in China: 55 for females and 60 for males (for some blue-collar female workers it is 50, and 55 for blue-collar male workers), and some urban workers of state-owned enterprises retire even earlier than the legal age (Du and Yang 2010, and Chen 2009). Chinese people, the majority of which is a rural population, continue to undertake agricultural work until they become frail. Research has shown that working on farmland and agriculture at a very high age is prevalent among the rural older population in China (Pang, de Brauw and Rozelle 2004). The policy advocates agricultural work in later life as "governments encourage people in their 60s to engage in farming, aquaculture and processing activities" (China State Council, 2006).

In addition, older persons in China support their families by providing help with housework and grandparental care to younger generation and care to older adults or other family members (Wang and Zhang 2018). The high rate of grandparental care is related to the tradition of grandparental care, but more importantly, to the lack of childcare infrastructure in China. As in South Korea, where there is better childcare, grandparental care is much less prevalent than in China. Grandparental care is similar to the average in EU countries, which means that grandparental care is not a unique tradition in China, though care provision in China is more intense. In addition, the higher participation in caring for family members might have led to lower participation in other ways in society, such as, social connectedness and lifelong learning, areas in which China scored lower on the AAI than Korea and the EU average. But participation in social activities is important to older adults' health; research showed that participation in social activities (e.g. included interaction with friends, participating in hobby groups, sports groups, community-related organizations, and doing voluntary work) is positively associated with cognitive function in older populations in China (Fu *et al.* 2018). Therefore, there is need to facilitate social activities that help older people balance their contribution to family duties and participation in social activities.

Chinese older persons are physically active and have high shares of healthy life expectancy, which explains their high employment rates at advanced ages (60+) and level of support to other family members (e.g. providing grandparental care). The focus of policy should still be on helping older persons actively involved in the economy by providing flexible retirement plan in which they can continue working if they choose to and be released from labour intensive work and pressures that are not beneficial for maintaining good physical health and well-being. On the other hand, being able to stay closer to families and support families promotes health, both physical and mental. Our results show that Chinese older people have lower level of independent living arrangement than Korea and the EU average, and they feel extremely safe in the community and enjoy very good mental well-being in later life. Therefore, the improvement in the independent, healthy and secure living should be focusing on reducing poverty and material deprivation and promoting lifelong learning.

China has made significant progress in building an old-age security system that consists of old-age social insurance, healthcare, and personal care to support families. For example, the new rural cooperative medical system and the new old-age social insurance system, which were piloted in the 2000s and are now fully implemented. However, the results show that older people in China fall behind the EU average in the access to health care, no poverty risk or material deprivation, which suggests that health care, financial and material support to older people are the areas to improve. According to the Ministry of Human Resources and Social Security of China (MHRSS) (2016), the challenge is to encourage the self-employed and small employers to enrol in and contribute to the system. The reformed pension schemes in China might have benefited those with high human capital and family capital and living in more developed regions, which strengthened social stratification in later life. This might mean that the system can meet the minimum living needs of older persons, but more work should be done in reducing inequalities in the coverage of social insurance and health care.

Still, older persons in China have very low rates of using the Internet and lifelong learning, and there is lower educational attainment in Chinese older persons than Korean and EU older persons. Therefore, continuing education and lifelong learning opportunities are very important for maximising the potential of the older population to age actively, which will enable them to integrate with the ever-changing society in China and contribute to the economy and society outside the family.

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Annex A1: AAI Indicators for China: Definition, data sources and survey questions

	Definition	***Survey questions***	***Source***
1. Employment			
Employment rate for the age group 55-59	Employment means having worked for at least one hour last week to earn some income, or currently work in agriculture but not employed.	A53. Have you worked for at learn one hour last week to earn some income (including military)? 1. Never worked for earning economic income. 2. Paid leave, training, or temporary laid off, or an off-season (go to A58) 3. Not paid leave, training, or temporary laid off, or an off-season (go to A58) 4. Yes, I worked for __ hours (go to A58) A5 what is your current job status? 1. Agricultural job 2. Agricultural job, but used to work in non-agricultural sector 3. Agricultural job, never worked in non-agricultural sector 4. No job currently, only has done agricultural job before 5. No job currently, , but used to work in non-agricultural sector 6. Never have a job before.	CGSS2014
Employment rate for the age group 60-64	Same as above		
Employment rate for the age group 65-69	Same as above		

	Definition	***Survey questions***	***Source***
Employment rate for the age group 70-74	Same as above		
2. Social participation and relationships (aged 55+)			
Participation in voluntary activities	Percentage of older population aged 55+ participated in voluntary activities.	DA056 Have you done any of these activities in the last month? (Code all that apply) **3. Provided help to family, friends, or neighbors who do not live with you** **4. Went to a sport, social, or other kind of club** **5. Took part in a community-related organization** **6. Done voluntary or charity work**	CHARLS 2015
Provide care to children / grandchildren	Percentage of older population aged 55+ providing help with housework for their children or taking care of their grandchildren at least 1-2 days a week, which is the categories 1-3 in F204.	F203 QF203 In the past 6 months, did you help " [CAPI] Load CFPS_ChildName" with housework or taking care of children? 1. Yes 2. No F204 QF204 "frequency of doing housework and taking care of children" In the past 6 months, how often did you do housework or take care of children for " [CAPI] Load CFPS_ChildName"? 1. Almost everyday 2. 3-4 days a week 3. 1-2 days a week 4. 2-3 days a month 5. Once a month 6. Once every few months	CFPS
Care to older adults or disabled relatives	Percentage of older population aged 55+ providing care to their parents or parents-in-law and sick or disabled adults who does not live with you	DA056 Have you done any of these activities in the last month? (Code all that apply) 3. Take care of your parents/ parents-in-law DA056 Have you done any of these activities in the last month? 7. Cared for a sick or disabled adults who does not live with you	CHARLS 2013

	Definition	***Survey questions***	***Source***
Participation in political activities	Not available		
3. Independent, healthy and secure living			
Physical exercise (aged 55+)	The percentage of people aged 55+ who undertake vigorous activities (including heavy lifting, digging, plowing, aerobics, fast bicycling, and cycling with a heavy load), moderate physical activities (including moving stuff, cycling, mopping the floor, Taichi, jogging) and any type of working (e.g. travel from place to place, recreation, sport, exercise or leisure) for at least 10 minutes at a time for at least five days during a week.	DA051 During a usual week, did you do any […] for at least 10 minutes continuously? Yes, No A. Now, think about all the vigorous activities requiring hard/high intensity physical effort that you do in a usual week. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, plowing, aerobics, fast bicycling, and cycling with a heavy load. Think only about those physical activities that you did for at least 10 minutes at a time. B. Now think about activities which take moderate physical effort that you do in a usual week. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or mopping the floor. Again, think about only those physical activities that you did for at least 10 minutes at a time. C. Now think about the time you spend walking in a usual week. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure. DA052 During a usual week, on how many days did you do […] for at least 10 minutes?	CHARLS
Access to health care	The percentage of people aged 55+ reported that they have access health care when ill last month, or who had not accessed health care but this is not due to poor delivery or provision of care (e.g.	ED001 In the last month have you visited a public hospital, private hospital, public health center, clinic, or health worker's or doctor's practice, or been visited by a health worker or doctor for outpatient care?	CHARLS

	Definition	***Survey questions***	***Source***
	a lack of money or time, poor transportation, or poor health service).	1. Yes 2. No ED002 Have you been ill in the last month? 1. Yes 2. No ED003 What's the main reason for not seeking medical treatment? 1. Already under treatment 2. Illness is not serious, don't need treatment 3. No money 4. No time 5. Inconvenient traffic 6. Poor service in hospital 7. Treatment is not useful 8. Other	
Independent living arrangements	The percentage of people aged 75+ who live in a household with only the respondent or a couple.	A001_W3 Whom do you live together? 1. Spouse 2. My parents or parents in law 3. Children 4. My Siblings 5. My spouse's Siblings 6. None of the above	CHARLS
Relative median income	The ratio of the median equivalised disposable income of people aged 65 and above to that of those aged below 65.	Total household disposable income from all types of household (urban, rural, and migrant) is used, and in order to reflect the difference in household size and composition, we used the 'square root scale'.	CHIP

	Definition	***Survey questions***	***Source***
No poverty risk for older persons	The percentage of people aged 65 years and older who are not at risk of poverty (people at risk of poverty are defined as those with an income below the at-risk-of-poverty threshold, which is set at 50% of the national median income).	% of people aged 65 or above who are not at risk of poverty. The relative poverty rate is calculated using the CHIP data. The 50% of the national median equivalised income is set as the threshold of poverty rate.	CHIP
No severe material deprivation for older persons	The percentage of people aged 65 years and older who are not severely materially deprived.	The survey asks the number of several items in the household. A variable is generated, indicating whether having the following equipment at home: • Cooking set • Fridge • Freezer • Washing machine • Dryer • Television set • Water boiler • Warm up equipment • Air conditioner Material deprivation is defined as not having at least four out of these nine items.	CGSS
Physical safety	The percentage of people aged 55 years and older who are feeling very safe or safe in their local area.	From the perspective of safety, how safe do you feel about your community 1. Very unsafe 2. Unsafe 3. It's ok 4. Safe 5. Very safe	CGSS

	Definition	***Survey questions***	***Source***
Lifelong learning	The percentage of older persons aged 55 to 74 who attended an educational or training course during last month.	DA056 Have you done any of these activities in the last month? (Code all that apply) 8. Attended an educational or training course	CHARLS

4. Capacity and enabling environment for active and healthy ageing			
Remaining life expectancy achievement of 45 years at age 60	Remaining life expectancy (RLE) at 60 divided by 45 to calculate the proportion of life expectancy achievement in the target of 105 years of life expectancy	The RLE at age 60 for China in 2012 is: Both sexes 19 Female 21 Male 18	United Nations (http://data.un.org/Data.aspx?q=life+expectancy&d=WHO&f=MEASURE_CODE%3aWHOSIS_000015)
Share of healthy life years in the remaining life expectancy at age 60	The proportion of HLE at age 60 to RLE at age 60	The HLE at age 60 for China in 2015 is: Both sexes 15.6 Female 16.4 Male 15	WHO Global Health Observatory http://apps.who.int/gho/data/view.main.HALEXv
Mental wellbeing (55+)	The percentage of older persons aged 55+ who have good mental well-being that is measured by a revised scale developed from CES-D.	CHARLS uses the Chinese translation provided at the Center for Epidemiologic Studies website. The answers for CES-D are on a four-scale metric, from rarely, to some days (1–2 days), to occasionally (3–4 days) to most of the time (5–7 days). 12.5 was used as the cut-off value to indicate good mental wellbeing. DC010. I had trouble keeping my mind on what I was doing. DC011. I felt depressed. DC012. I felt everything I did was an effort. DC015. My sleep was restless. DC016. I was happy. 1. Rarely or none of the time (< 1 day)	CHARLS

	Definition	***Survey questions***	***Source***
		2. Some or a little of the time (1 - 2 days) 3. Occasionally or a moderate amount of the time (3 -4 days) 4. Most or all of the time (5 - 7 days)	
Use of ICT by older persons aged 55-74	The percentage of older persons aged 55-74 who used the Internet almost every week during last month.	DA056 Have you done any of these activities in the last month? (Code all that apply) 10. Used the Internet	CHARLS
Social connectedness	The percentage of older population aged 55+ who • Interacted with friends • Played Ma-jong, played chess, played cards, or went to community club	DA056 Have you done any of these activities in the last month? (Code all that apply) 1. Interacted with friends 2. Played Ma-jong, played chess, played cards, or went to community club	CHARLS
Educational attainment of older persons	The percentage of older persons aged 55 to 74 who completed at least high school or those who obtained adult education degrees (categories 5 to 13 in the dataset).	A7a. What's the highest level of education you have attained? 1. No formal education (illiterate) 2. Sishu/literate school 3. Elementary school 4. Middle school 5. Vocational high school 6. High school 7. Vocational school 8. Technical school 9. Two-/Three-Year College/Associate degree (adult education) 10. Two-/Three-Year College/Associate degree 11. Four-Year College/Bachelor's degree (adult education) 12. Four-Year College/Bachelor's degree 13. Master's degree or higher 14. others	CGSS

	Definition	***Survey questions***	***Source***

Annex A2: Roll-out of the AAI in Korea and its learnings

Due to the increasing life expectancy and ever-dropping fertility rate, Korea as a society has experienced a rapid ageing phenomenon over the past 20-30 years (Choi, 2015). Currently, the AAI is not used in Korea, but there is great interest to construct and analyse AAI for Korea for use as a toolkit for monitoring, implementing, and evaluating policies for the ageing society.

In Korea, among the three ageing-related longitudinal studies, the KLoSA data have been identified to be the most suitable datasets for many indicators of active ageing. Availability of data for the AAI indicators such as employment and social participation, access to health/dental care, income and poverty, mental well-being, and educational attainment in older age are reasonably good in KLoSA.

However, the AAI indicators pertaining to those related to secure living are difficult to obtain. For example, surprisingly, none of the ageing-related datasets provide information about 'feeling safe walking at night' indicator. In addition, it is problematic to compare such ageing data to other European or East Asian countries due to the definitions and methods used in surveys differing across countries (as discussed in Zaidi *et al.* 2018). Thus, the application of the EU AAI methodology completely to a Korean context is challenging given the data limitation for some indicators. In some cases, we had to use proxies which resulted in a slightly modified version of the AAI.

The AAI Korea confirms the feasibility of constructing the AAI in non-European countries and its usefulness to understand and monitor progress of active ageing in the country (for details, see Um, Choi and Zaidi, 2018). Keeping in mind the data limitations and differences in definition used in the AAI methodology, the following key findings emerged:

- The AAI results in Korea show that **the employment participation domain performs extremely well compared with the 28 EU countries**, but other domains, especially 'Social participation' and 'Independent, healthy and secure living' are achieving less favourable outcomes in Korea. A possible explanation for high employment participation rate is that older persons work longer due to a relatively immature state pension system and a high rate of self-employment among workers, who are less able to build a decent retirement pension income in comparison to full-time employees (Lee and Lee, 2011; Yang and Klassen, 2010).

- Older persons in Korea show similar participation rate in voluntary activities compared to the EU average but **low in political activities**. Korean older persons also report **lower involvement in providing care to their grandchildren or adult family members** compared with the same phenomenon in many countries in the EU. This may be because childcare service provision and long-term care for older people is nearly universal in Korea and many older persons are obliged to work for a living due to immature state pension.

- Compared with the EU average, **Korean older persons take part more often in physical activities and there is very low unmet medical need in Korea.** In addition, the life expectancy at age 60 and shares of years in good health is continuously increasing in Korea. In contrast, mental well-being status of older persons is slightly lower than what is observed on average for the EU countries and China.

- The **financial well-being of older persons in Korea is the worst compared with their European counterparts and China**. The poverty risk and material deprivation in old age is very high and the relative median income for older persons is very low. It shows an existence of vast income inequality in the country and how much the current welfare system requires a reform in supporting the low-income groups in their old age.