Chapter 1
Demographic Change in a Complex World

Cristina Martinez and Tamara Weyman

1.1 Global Features of Demographic Change

Although the world's population is increasing, population growth rates are in decline, from a peak of 2.1% in 1968 to 1.1% in 2012, and are projected to continue to decline into the future, to 0.4% by 2050 (Fig. 1.1) (OECD StatsExtract). Total populations for OECD member countries are also predicted to steadily increase, but at a slower rate because of the more economically developed member countries; however, as with the worldwide projection, the population growth rate is expected to decline in the future to 0.19% by 2050 (Fig. 1.1) (OECD StatsExtracts).

1.1.1 The Population Slow-Down Is Primarily the Result of Declining Fertility Rates

In 1970, the average world fertility rate was 4.85 and that of the OECD was 2.73; by 2009, it had dropped to 2.52 and 1.74 respectively (OECDstats Extract). During the period 1950–1955, there was a significant gap between more developed regions and less developed ones (2.81 and 6.07 respectively) (United Nations Department of Economic and Social Affairs, Population Division 2011). Interestingly, according to the UN World Population Prospects, both more developed regions and less developed ones will have similar fertility rates by 2065 (Fig. 1.2), at a rate of 2.02 and 2.12 respectively (2060–2065).

C. Martinez (✉) • T. Weyman
Western Sydney University, Locked Bag 1797, Penrith, NSW 2751, Australia
e-mail: c.martinez@westernsydney.edu.au; t.weyman@bigpond.com

C. Martinez et al. (eds.), *Demographic Transition, Labour Markets and Regional Resilience*, Advances in Spatial Science, DOI 10.1007/978-3-319-63197-4_1

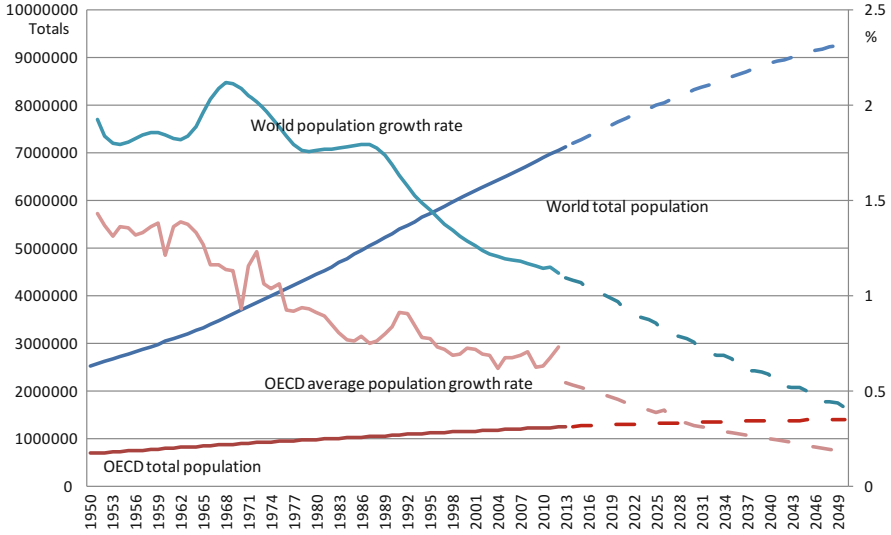

Fig. 1.1 World and OECD population totals, growth trends and projections. *Note:* Calculated estimate values for OECD totals are projections from 2031 to 2049. *Source:* OECD (2014), *Fostering Resilient Economies: Demographic Transition in Local Labour Markets*, available at: http://www.oecd.org/cfe/leed/Fostering-Resilient-Economies_final_opt.pdf based on data from OECD.StatsExtract. Available at: http://stats.oecd.org/Index.aspx. Accessed June 2012

As a consequence of falling fertility rates, the transition in population structure, as illustrated in Fig. 1.3, means that the world and OECD average youth (aged less than 15 years old) populations are declining. In 1950, the world and OECD youth accounted for 34.3% and 28.9% respectively; by 2010, it had dropped to 26.8% and 18.5% respectively; and by 2025, it is estimated to continue to decline to 23.9% and 16.9% respectively. Currently, the world youth average is 8% points higher than the OECD's, reflecting the OECD's membership of more developed countries. At the same time, the average world and OECD elderly population rates (aged 65 and over) are increasing. In 1950, the world's and OECD's elderly accounted for 5.2% and 7.7% respectively; by 2010, these figures had increased to 7.6% and 14.5% respectively, with the OECD average expected to exceed the youth population growth rate by 2019. By 2025, the elderly will account for 10.5% and 19.6% respectively (United Nations, Department of Economic and Social Affairs, Population Division 2011; OECDstats Extracts).

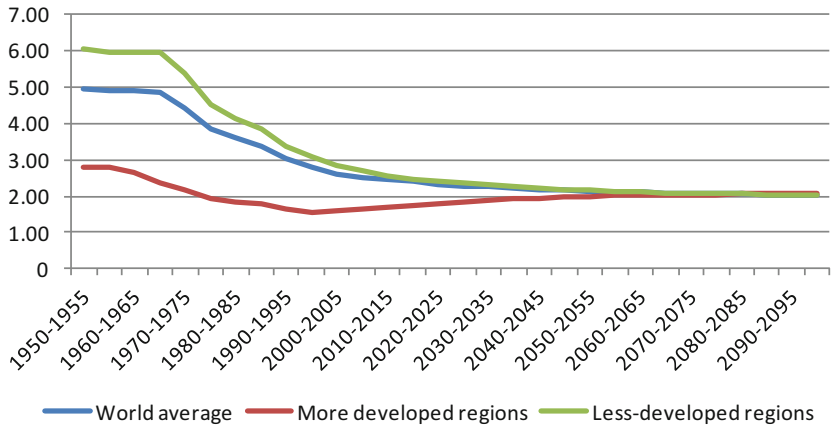

Fig. 1.2 Fertility rate projections for the world and more-/less-developed regions. *Source:* OECD (2014), *Fostering Resilient Economies: Demographic Transition in Local Labour Markets*, available at: http://www.oecd.org/cfe/leed/Fostering-Resilient-Economies_final_opt.pdf based on data from United Nations, Department of Economic and Social Affairs, Population Division (2011), *World Population Prospects: The 2010 Revision*, CD-ROM Edition, United Nations, New York

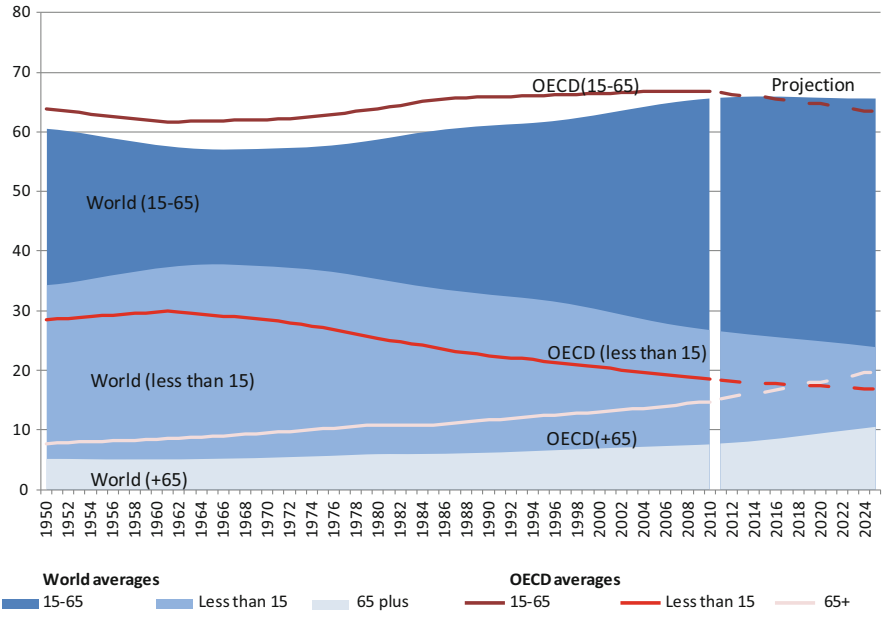

Fig. 1.3 Trends and projections in population structure: World and OECD averages. *Note*: Calculated estimate values for world average projections for the values between the 5-year intervals. *Source*: OECD (2014), *Fostering Resilient Economies: Demographic Transition in Local Labour Markets*, available at: http://www.oecd.org/cfe/leed/Fostering-Resilient-Economies_final_opt.pdf based on data from United Nations, Department of Economic and Social Affairs, Population Division (2011), *World Population Prospects: The 2010 Revision*, CD-ROM Edition, United Nations, New York; OECD.StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed June 2012

1.1.2 Population Dynamics Indicate Shrinkage or Stagnation

Population shrinkage or stagnation is either being experienced or is projected to occur in the near future in many countries, but will be much more pronounced in specific regions as will be shown in the case studies analysed in later chapters. As illustrated in Fig. 1.4, Japan will experience a significant population decline and the People's Republic of China and Korea is expected to decline from 2030, both reflects of population policy. Poland has been steadily declining since the early 2000s as result of entering the European Union, which has made out-migration to other EU-countries easier. Generally, population stagnation will occur in the Netherlands and Sweden, which is comparable to the OECD levels.

Fertility levels and international migration rates impact the growth rates of countries. The majority of case study countries are experiencing declining fertility rates, to below replacement levels (of 1.5), with notable declines in China, Japan, Poland and Italy corresponding to the overall declining population growth rates. Fertility stagnation has occurred in the Netherlands, Sweden and United States. As illustrated in Fig. 1.5, it is the migration rates that truly impact the population

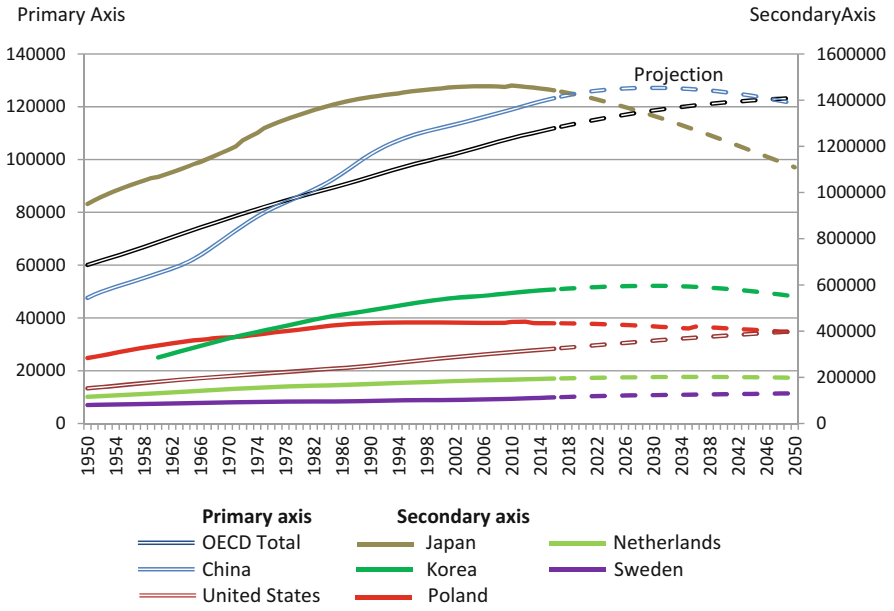

Fig. 1.4 Population trends and projections (1950–2050). *Note:* The primary axis (*left axis*) is for the OECD and China due to their large population totals. The secondary axis (*right*) is used for the other countries with smaller population totals. *Source*: Updated from OECD (2014), *Fostering Resilient Economies: Demographic Transition in Local Labour Markets*, available at: http://www.oecd.org/cfe/leed/Fostering-Resilient-Economies_final_opt.pdf based on data from OECD. StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed September 2016

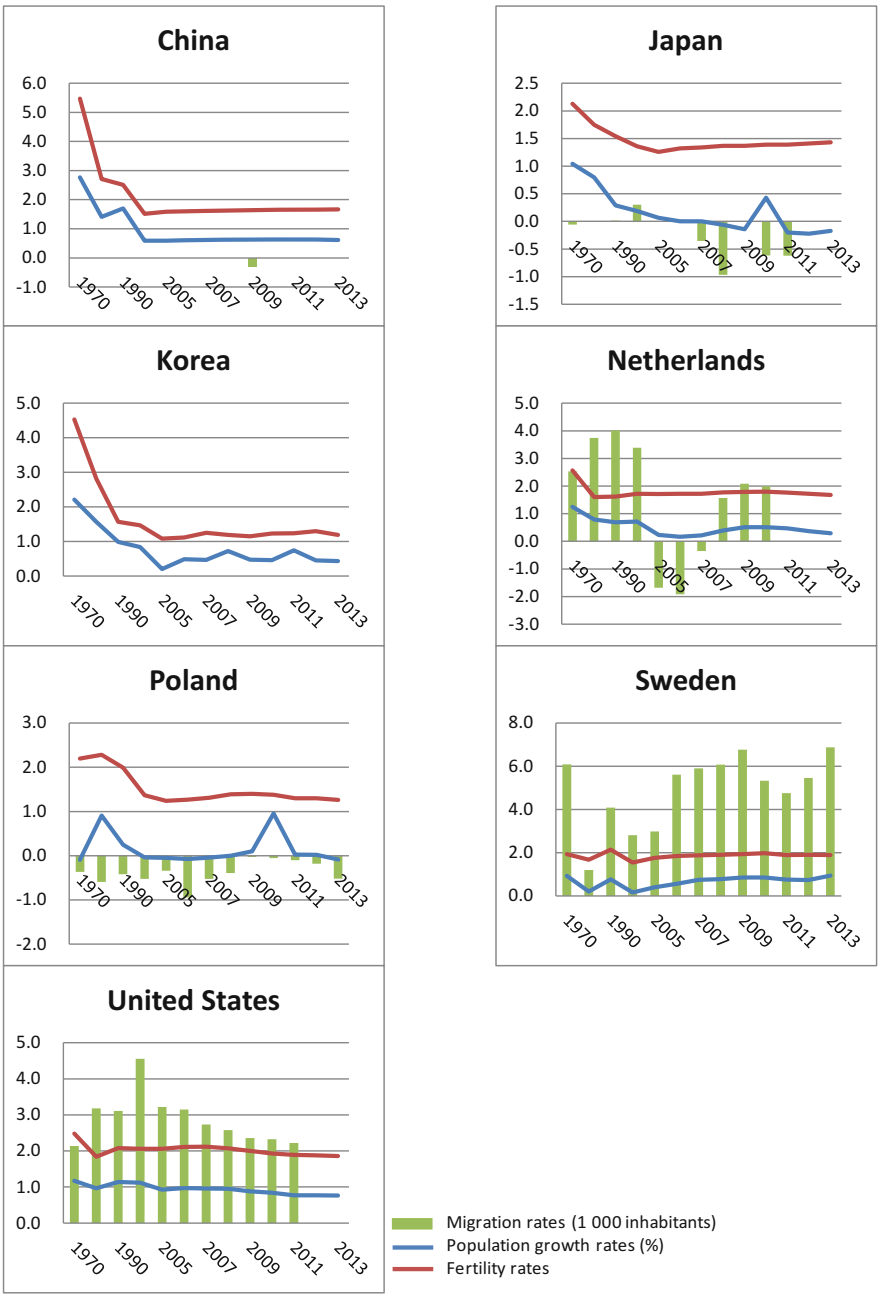

Fig. 1.5 Population growth, fertility and migration rates (1970–2010). *Source*: Data from OECD. StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed September 2016

growth, reflecting the fluctuating trends, especially in the Netherlands, and Sweden. Poland has experienced a negative migration rate since the 1970s, which has significantly impacted its population growth. In China, although migration statistics are not available, a fundamental decline in fertility and thus population growth has occurred. Both fertility rates and migration patterns reflect the policy focus needs of different nations, encouraging families, resilient communities and economies.

There has been a significant increase in life expectancy across all of the case study countries, which reflects better healthcare, lifestyles and age management (Fig. 1.6). In 2014, Japan (at 83.7 years) had the highest life expectancy, followed by Sweden (82.3 years) Korea (82.2), and the Netherlands (81.8). China has the lowest life expectancy, but has experienced the greatest increase since the 1960s (when it was 43.4 years) to 2014 (75.8 years), an overall increase of 32.4 years. In 2014, Poland had the next lowest life expectancy (77.7 years), this has increased by 9.9 years since the 1960s, followed by the United States (78.8 years) increased by 8.9 years since 1960. Other countries with notable improvements since the 1960s include Korea (29.8 years) and Japan (15.9 years). The increasing life expectancy rates will have a profound impact on the population structure of these countries in the future, and will have implications for health, labour and social inclusion policies.

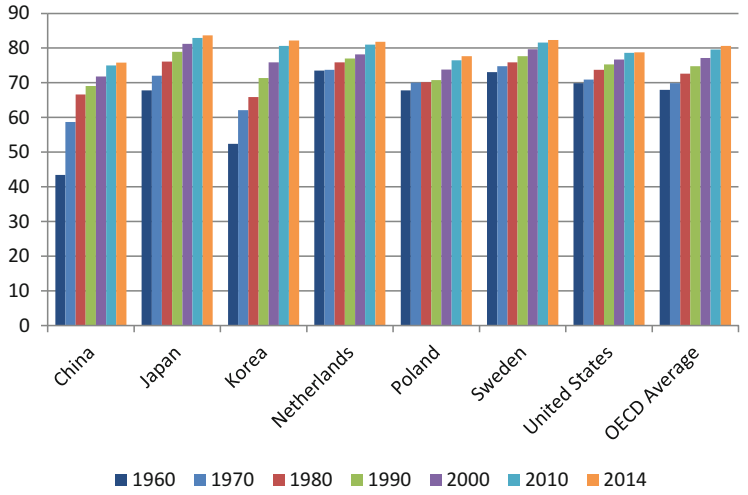

Fig. 1.6 Life expectancy trends at birth (1960–2010). *Source*: Data from OECD.StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed September 2016

1.1.3 Population Structure Shows Dwindling Youth and Population Ageing

Declining fertility rates and increases in life expectancy have meant there has been a profound impact on the population structure of countries across the world. Generally, youth (aged less than 15 years) population rates have been declining since the 1960s, and in some countries this decline is expected to continue until 2050 as a consequence of declining fertility rates. All of the case study countries have experienced dwindling youth proportions (Fig. 1.7), the most significant of which were between 1960 and 2010, with a 26.2 percentage-points drop in Korea, followed by China (−21.5 percentage-points) and Poland (−18.2 percentage-points). However, in 2010, United States had the highest proportion of youth (19.8%), followed by the China (18.1%) and the Netherlands (17.5%). As can be seen in Fig. 1.7, from 2010 to 2050 it is expected that Sweden's youth population will stabilised. The youth are these countries' future labour force, therefore, the consequences of dwindling youth rates impact the socio-economic fabric of these countries' futures. The importance of family policy, supporting family-friendly environments and workplaces, could be encouraged.

As a result of increasing life expectancy rates, the proportion of the population over 65 years has increased, resulting in an ageing population phenomenon. By 2050, according to HelpAge International (2013), older people (aged 60 years and over) will make up more than one-fifth of the global population. Asia according to ADB (2017) is expected to become one of the oldest regions in world in the next few decades. All of the case study countries' populations are ageing (Fig. 1.8), in 1960, Korea and China had the lowest proportions of elderly population (2.9% and 4.0% respectively). Sweden, in 1960, had the highest elderly population proportion at 11.8%. In 2010, China still had the lowest proportion, with 8.4% falling into the elderly category; however, Japan has the highest proportion, at 23.0%, followed by

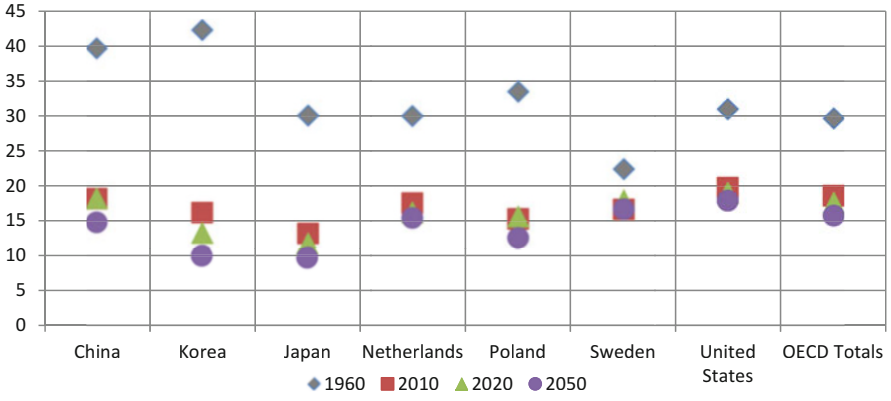

Fig. 1.7 Youth (less than 15 years old) population levels (1960–2050). *Source:* Data from OECD. StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed April 2017

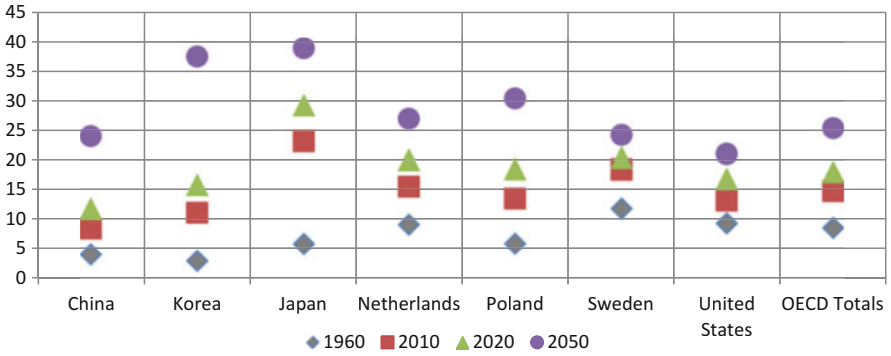

Fig. 1.8 Elderly population (over 65), 1960–2050. *Source:* Data from OECD.StatsExtract. Available at: http://stats.oecd.org/Index.aspx, accessed April 2017

Sweden (18.3%). By 2050, Japan's elderly population will make up almost 40% of its population, followed by Korea (37.4%) and Poland (30.3%). From 2010 to 2050, Korea, Poland, Japan and China will have the fastest growing elderly populations (26.4, 16.9, 15.8 and 15.6 percentage-points respectively). By 2050, the United States, China, Sweden and the Netherlands will have the smallest elderly population rates, but these are still a significant 20.9%, 23.9%, 24.1% and 26.9% respectively. Population ageing is having, and will cause, many challenges to societies and economies, resulting in changes in labour markets, societal structures and social security systems (Cedefop 2012). In Asia, younger Asian countries could strive to capitalise on their young workforce through the creation of job opportunities through active labour-market policies and vocational training. While the middle- and advanced Asian ageing countries could focus on physical and human capital as important growth drivers and structural reforms such as retraining programs and flexible working arrangements to postpone retirement (ADB 2011).

1.1.4 Increasing Longevity Requires Age Management for all Countries

Many demographic trends in the case study regions are specifically related to the ageing of the population, which is creating challenges for the national and regional economies. There is an increasing concern regarding workforce ageing and the need for products and services for seniors. Long-term care systems, support of non-government organisations, creation of new leisure and business services and products, as well as provision of opportunities for entrepreneurship and small and medium enterprise (SME) development, are all policy considerations for active ageing. In order to get insight in these processes and to monitor evolving trends adequate statistical information is needed and this needs to be presented in a way

which is suitable for policy purposes. Currently, there are two ageing indexes to assist national policy makers in identifying gaps and policy response:

- Active Ageing Index (AAI), for Europe only
- Global AgeWatch Index.

The AAI was developed in the context of the European Active Ageing and Solidarity between Generations, 2012 by the European Centre for Social Welfare Policy and Research in Vienna. "The AAI is a new analytical tool that aims to help policy makers in developing policies for active and healthy ageing. Its aim is to point to the untapped potential of older people for more active participation in employment, in social life and for independent living. Mobilising the potential of both older women and men is crucial to ensure prosperity for all generations in ageing societies" (European Commission and United Nations Economic Commission for Europe 2013). The AAI project is now managed jointly by the European Commission's Directorate General for Employment, Social Affairs and Inclusion (DG EMPL), and the Population United of the United Nations Economic Commission for Europe (UNECE).

Box 1.1 Active Ageing Index

The Active Ageing Index (AAI) was constructed from four different domains, with each domain presenting a different aspect of active and healthy ageing. The first three domains refer to the actual experiences of active ageing (employment, unpaid work/social participation, independent living), while the fourth domain captures the capacity for active ageing as determined by individual characteristics and environmental factors. The AAI is a composite index, which means that a number of individual indicators contribute to each of the domains. In total there are 22 individual indicators across 4 domains. Each individual indicator can be positively interpreted, meaning that the higher the indicator value, the better the active ageing outcome. For example, the more care older people provide for others, the better are their active ageing outcomes. Indicators are weighted individually and then combined within the four domains, thus creating the domain-specific indices. The overall AAI is then the weighted average of the four domain-specific indices. The results of the AAI are presented as a ranking of countries by the scores achieved in the overall AAI and in the domain-specific indices. The rank order of countries differs across domains. The rank of each country in the AAI is determined by the score it obtains in the four domains and in the overall index. Individual country scores show the extent to which its older people's potential is used and the extent to which they are enabled to participate in the economy and society. The theoretical maximum for the index is assumed to be 100. Currently, none of the countries comes anywhere near this maximum. If this was the case, it would indeed imply a much higher

(continued)

Box 1.1 (continued)

life expectancy and an unrealistically high participation of older people in the economy and society. Thus, the index is constructed in such a way that even the best-performing countries cannot reach the ceiling of 100. As a result of this methodological choice, current top performers like Sweden or Denmark only pass the 40% mark. Improvements are possible even for the top performers, but obviously, 100 would not be a realistic goalpost at present.

Source: European Commission and United Nations Economic Commission for Europe (2013), "Policy brief: Introducing the Active Ageing Index", March, https://ec.europa.eu/eip/ageing/sites/eipaha/files/library/514c3a35bfc71_Policy%2Bbrief%2BFinal%2BMarch%2B2013%5B2%5D.pdf.

Currently, the AAI is completed for European countries; below is a summary of the results for the Netherlands, Poland and Sweden. As outlined in Box 1.1, results are presented as a ranking of countries by scores achieved. According to the Active Ageing Index, overall, Sweden ranks 1st out of the EU28, the Netherlands ranks 3rd, and Poland 27th (Fig. 1.9). Within specific component indices:

- Employment: Sweden ranks 1st, followed by the Netherlands (6th), and Poland (20th);
- Participation in society: Sweden is ranked 3rd, followed by the Netherlands (5th), and Poland (28th);
- Independent living: the Netherlands ranked 3rd, followed by Sweden (4th) and Poland (24th);
- Capacity for active ageing: Sweden ranks 1st, followed by the Netherlands (4th), and Poland (22nd).

The scores for theoretical potential for full active ageing engagement of people working, or providing skills inputs, reveals the potential for improvement and the need for policy focus (Fig. 1.9). Although Sweden is ranked first overall, its score was 44.9%, therefore, improvements are possible and could be encouraged and not be underestimated. The Netherlands' score was 40.0%, which would make it possible to achieve an improved economy, with increased aged productivity and lower healthcare costs. Thus, policy efforts need to be directed towards this end, in areas such as workplace activation, volunteerism and long-life learning. Poland's score was 28.1% of the theoretical potential. Policy efforts need to be directed towards this end, in areas such as encouraging healthy and active communities, inter-generational solidarity, managing the ageing workforce, and skills and competency development.

The AAI highlights the national differences between countries and the challenges of ageing populations in society. Policy focus, no matter how advanced a

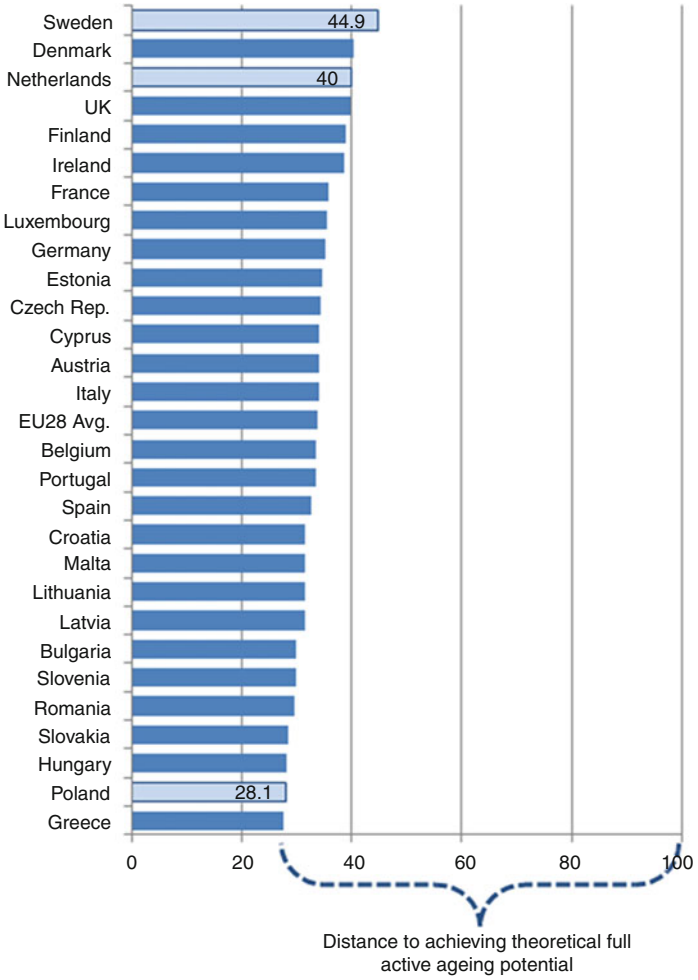

Fig. 1.9 Active Ageing Index results across EU28 countries. *Source*: Data from UNECE and European Commission (2015) *Active Ageing Index 2014: Analytical Report*, Report prepared by Asghar Azidi of Centre for Research on Ageing, University of Southampton and David Stanton, under contract with United Nations Economic Commission for Europe (Geneva), co-funded by European Commission's Directorate General for Employment, Social Affairs and Inclusion (Brussels)

country is, could continually encourage inter-generational solidarity, management practices for an ageing workforce, lifelong learning, and inclusive and resilient communities.

In addition to the AAI which is limited to European countries, the newly launched Global AgeWatch Index covers countries from all over the world. It is supported by international organisations such as the World Bank, the World Health Organisation (WHO), the International Labour Organisation (ILO) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The Global

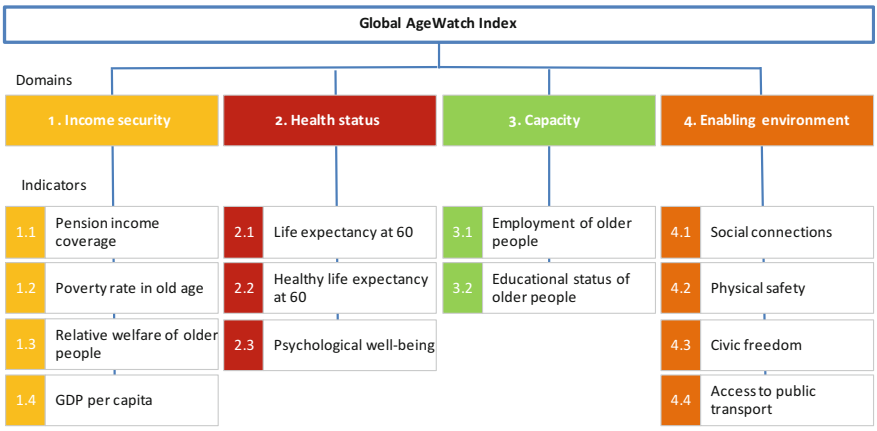

Fig. 1.10 Global AgeWatch Index domains and indicators. *Source*: HelpAge International (2015), *Global AgeWatch Index 2015: Insight report*, HelpAge International, London

Table 1.1 Global AgeWatch Index: Case study country results

	Overall rank and value		Income security		Health status		Capability		Enabling environment	
	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value
Sweden	3	84.4	7	83.5	12	75.2	5	65.6	6	79.4
Netherlands	6	83	5	85.9	13	74.8	12	59.6	5	76.6
Japan	8	80.8	33	75.1	1	83.9	7	62.7	21	75
United States	9	79.3	29	76.3	25	70.1	4	65.7	17	76.8
Poland	32	57.4	26	77.6	48	55.3	52	31.1	37	69.2
China	52	48.7	75	39.2	58	46.5	39	37.8	28	71.8
South Korea	60	44	82	24.7	42	58.2	26	47.6	54	64.1

Note: The value shows how near a country is to the ideal value (100)
Source: data from HelpAge International (2015), *Global AgeWatch Index 2015: Insight report*, HelpAge International, London.

AgeWatch aims to "... capture the multi-dimensional nature of well-being and quality of life of older people, and to provide a means by which to measure performance and promote improvement" (HelpAge International 2013: 12). The index contains 4 key domains (income security, health status, employment and education, and enabling environment) under which 13 indicators are utilised (Fig. 1.10). According to HelpAge International (2013), the "...overall index is calculated as a geometric mean of the four domains."

The index results illustrate that Nordic, Western European, North American and some Asian and Latin American countries fare the best in well-being and quality of life for older people. Sweden again tops the index and features in the top 10 of all four domains. Table 1.1 outlines the case study countries' overall and domain ranking, highlighting possible gaps and scope for progress in older peoples' well-being.

Box 1.2 outlines the key conclusions from the 2013 and 2015 Indexes about how countries are responding to the challenges and opportunities of population ageing.

Box 1.2 Global AgeWatch Index: Key Findings

Key Finding from 2013 Index:

- Money is not everything. A number of low-income countries have shown that limited resources do not have to be a barrier to providing [care] for their older citizens. Examples include non-contributory basic pensions as part of social welfare programmes or free or subsidised healthcare for older people.
- Guaranteeing the well-being of all. History counts: People in countries that have a record of progressive social welfare policies for all citizens across the life-course are more likely to reap the benefits in old age.
- Maintaining the momentum. It is never too soon to prepare: Countries are at different points on the ageing trajectory. Those that have a significant youth population can potentially benefit from a "demographic dividend", as they have large numbers of people of prime working age.
- Addressing the data challenge. Ageing requires action: The most urgent concerns for older people worldwide are a guarantee of income security and access to affordable healthcare.

Key Finding from 2015 Index:

- Inequality is increasing: Inequality in health, education and income levels of older people is increasing between top-ranked, high-income countries and bottom-ranked, predominantly low-income countries.
- Success means building independence. The countries doing best in the Index have social and economic policies supporting older people's capabilities, wellbeing and autonomy and do not rely on families to support their relatives alone. They have long-standing social welfare policies delivering universal pensions and better access to healthcare, as well as action plans on ageing.
- Ageing in BRICS countries. Among the BRICS group (Brazil, Russia, India, China, South Africa), China is a rapidly ageing country—over 15% of the population are 60 and over—that is proactively and strategically responding to demographic change. The Rural Social Pension Scheme introduced in 2009 resulted in 89 million people receiving pension payments for the first time. Combined with those receiving payments under other pension schemes, this means that 125 million people now receive a monthly pension. In 2013, a national law was amended to protect the rights of older people, mandating local governments to provide social security, medical and long-term care to their older citizens. China increased pension

(continued)

Box 1.2 (continued)

and health insurance coverage, encouraged volunteers to care for their elders and invested in community centres for older people.

- Austerity measures hitting older people in Europe and North Africa. The 2008 financial crisis affected pensions across Europe. In 2009, Poland reduced the number of people eligible for early retirement from 1.53 million to 860,000, and pension levels are set to decline from 51% of average wages to 26%.
- A better world for all ages. The third report shows that creating a better world for all ages is within reach. Policies and programmes can protect and promote human rights as we age, leading to the end of all forms of discrimination, violence and abuse in older age. To secure incomes, it is vital to advance the right to social security in old age, by ensuring universal pension coverage. To keep people in the best possible health, and increase healthy life expectancy, everyone needs access to good quality healthcare that is appropriate and affordable across their lifetime.

Sources: HelpAge International (2013), *Global AgeWatch Index 2013: Insight report*, HelpAge International, London; and HelpAge International (2015), *Global AgeWatch Index 2015: Insight report*, HelpAge International, London.

The demographic trends outlined in this chapter show that population shrinkage or stagnation is already either being experienced or is projected to occur in the near future. Declining fertility rates and increases in life expectancy have meant there has been a profound impact on the population structure of countries across the world. These trends highlight a number of unresolved policy issues at the national, but certainly also at the local and regional level that will be studied in detail in the following chapters.

References

ADB (2011) Asian development outlook update: preparing for demographic transition. Asian Development Bank, Philippines. https://www.adb.org/sites/default/files/publication/29086/adu2011.pdf

ADB (2017) Population and aging in Asia: the growing elderly population. https://www.adb.org/features/asia-s-growing-elderly-population-adb-s-take. Accessed Jan 2017

Cedefop (2012) Working and ageing: the benefits of investing in an ageing workforce. Publications Office of the European Union, Luxembourg

European Commission and United Nations Economic Commission for Europe (2013) Policy brief: introducing the active ageing index, March. https://ec.europa.eu/eip/ageing/sites/eipaha/files/library/514c3a35bfc71_Policy%2Bbrief%2BFinal%2BMarch%2B2013%5B2%5D.pdf

HelpAge International (2013) Global AgeWatch Index 2013: insight report. HelpAge International, London

HelpAge International (2015) Global AgeWatch Index 2015: insight report. HelpAge International, London

OECD (2014) Fostering resilient economies: demographic transition in local labour markets. http://www.oecd.org/cfe/leed/Fostering-Resilient-Economies_final_opt.pdf

OECD.StatsExtracts. http://stats.oecd.org/Index.aspx. Accessed June 2012 and Sep 2016

UNECE and European Commission (2015) Active Ageing Index 2014: analytical report, Report prepared by Asghar Azidi of Centre for Research on Ageing, University of Southampton and David Stanton, under contract with United Nations Economic Commission for Europe (Geneva), co-funded by European Commission's Directorate General for Employment, Social Affairs and Inclusion (Brussels)

United Nations, Department of Economic and Social Affairs, Population Division (2011) World population prospects: the 2010 revision, CD-ROM Edition. United Nations, New York