

# THE ROUTLEDGE HANDBOOK OF THE ECONOMICS OF AGEING

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## **Chapter 37**

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### **GLOBAL AGEING AND HEALTH**

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# GLOBAL AGEING AND HEALTH

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## **Abstract**

Life expectancy has risen in all countries around the world and is expected to continue to increase everywhere in the medium to long run. Not only individuals are ageing, so are populations worldwide. The shift toward older populations is the consequence of a globally expanding demographic transition that began in countries with higher income and extended to countries with lower income. As the world is ageing, ageing interacts with other megatrends, including chronic manifestations of health conditions, the aspiration to achieve universal health coverage, the occurrence of pandemics, or changes in climate, migration, family structures and digitalization. The first part of this chapter describes global developments in population ageing, individual ageing, and individual health based on data from the World Population Prospects and the Global Burden of Disease Study. The second part of the chapter discusses connections between ageing and other megatrends. The chapter ends with an outlook on the opportunities and challenges for an ageing world.

## **37.1 An Ageing World**

Global life expectancy has risen from 46.5 years in 1950 to 72.8 years in 2019, and during the COVID-19 pandemic has decreased to 71.0 years in 2021. It is projected to rebound to 73.4 years in 2023 and to increase to 82.1 years by the end of this century. Not only individuals but also populations are ageing. In 2021, every tenth person was older than 65. By 2050, this will be every sixth person. By 2065, more people over 65 than under 15 could be living in the world (UNDESA, 2022). The shift toward an older world population affects many spheres of life. It is the result of a demographic transition that began in countries with higher income and extended to countries with lower income (Bloom et al., 2017; Caldwell, 1976). The first part of this chapter begins with an overview of the status of the demographic transition around the world. Then developments in population ageing, individual ageing, and the health of ageing individuals are presented. Data stem primarily from the World Population Prospects (WPP) of the United Nations, Department of Economic and Social Affairs, Population Division, and the Global Burden of Disease (GBD) Study. The second part of this chapter discusses connections between ageing and chronic conditions, healthcare and coverage, pandemics, and health impacts of climate change, migration, family structures, and digitalization. The chapter ends with an outlook on the opportunities and challenges for an ageing world.

## 37.2 Ageing Populations

### 37.2.1 Demographic Transition

Fertility, mortality, and net migration (immigration minus emigration) determine the age composition of a population as well as population growth. Countries around the world have been or are in a demographic transition progress from higher mortality and higher fertility to lower mortality and lower fertility. The resulting declining number of people of younger age and the simultaneous increase in the number of older people change the age distribution and growth rate of populations locally, regionally, and globally. The GBD Study 2019 defined five stages of the demographic transition (before transition, early transition, mid-transition, late transition, and post transition) for a global demographic analysis of 204 countries and territories from 1950 to 2019. Before transition, the crude birth rate and crude death rate are high. In the early transition stage, the crude death rate starts to decline, but population growth remains low (less than 3 percent per year). In the mid-transition stage, the crude birth rate and crude death rate decline sustainably; as the mortality decline precedes the fertility decline, the population grows substantially (more than 3 percent per year). The late-transition and post-transition stages are characterized by a beginning and sustained population decline, respectively; individuals enjoy a high life expectancy as compared with early demographic transition stages. In 1970, no country was before transition or post transition, 17 countries were in early transition, 93 in mid-transition, and 94 in late-transition. By 2019, no country was before transition or in early demographic transition and 35 countries were in mid-transition. Of the 131 countries in late transition in 2019, 81 had net emigration and 50 had net immigration. The post transition stage was reached by 38 countries, of which 18 had net emigration and 20 net immigration (Wang et al., 2020). In sum, all countries in the world are now experiencing falling death rates. Population growth is increasing due to longer life rather than fertility. Countries whose population is still growing are on a path to slower or negative population growth. Populations age faster where relatively young people emigrate and slower where relatively young people immigrate.

### 37.2.2 Population Growth

The earlier onset of the demographic transition in countries with higher income implies that population growth rates differ across the world. In 2021, the annual rate of population change ranged from 0.16 percent growth in high-income countries to 2.6 percent growth in low-income countries according to the WPP 2022. In 1950, populations grew on average per year by 1.1 percent in high-income countries, 1.9 percent in upper-middle-income countries, 2.1 percent in lower-middle-income countries, and 1.3 percent in low-income countries. The annual rate of population change in 2100 is projected to range from a 0.73 percent reduction in upper-middle-income countries to a 0.43 percent growth in low-income countries (UNDESA, 2022). Due to globally increasing life expectancies and falling birth rates, the world population is predicted to grow, but increasingly slowly, from an estimated 8 billion people in 2022 to its maximum in the second half of this century. Population growth is expected to stop first in younger age groups and upper-middle-income countries and then overall. At which time and number the world population growth is expected to stop differs across forecasts. According to the WPP 2022 mid-variant projection, the world population will peak at 10.4 billion in 2086. According to the reference forecast of the GBD Study 2019, the world population will peak at 9.73 billion in 2064 (Vollset et al., 2020). Both predictions have in common that, first, the world population growth ends in the foreseeable future and, second, more elderly people will be living in the future—in absolute numbers and as a share of the total population. The global

trend of declining fertility drives the decline in world population growth and future population shrinkage. It has been attributed to lower child mortality, the empowerment of women, improved access to contraception, a decoupling of old-age well-being from the support of children, and coercive policy interventions among other reasons (Bloom, 2011; Roser, 2017). The global fertility rate has fallen from 4.9 children per woman in 1950 to 2.3 in 2021 according to the WPP 2022. It is projected to further fall to 1.84 by the end of the century, that is, below the replacement rate of about 2.1 children per woman. Fertility has been found to rise again at very high levels of development measured through the Human Development Index. This reversed fertility decline could slow population ageing in some highly developed countries or in countries reaching high levels of development in the future (Myrskylä et al., 2009). Notwithstanding if fertility might rise again on a low level in some countries, the remaining world population growth is attributed to increasing life expectancy rather than high fertility. As a result, the world population is predicted to become older while at first growing and then shrinking.

### **37.2.3 Population Aged 65 or Over**

The number and the share of people aged 65 or over have been steadily rising in the world population from 128 million (5.1 percent of the world population) in 1950 to 761 million (9.6 percent) in 2021 (Figure 37.1). By 2050, 1.6 billion people (17 percent) could be 65 or more years old. By 2100, it could be 2.5 billion (24 percent). Globally, the population aged 65 or over is growing faster than all other age groups in the WPP 2022 medium-variant projection. Comparing across country income groups, more people 65 or over than people under 15 live in high-income countries since 2015. Upper-middle-income countries are expected to reach this point in their population ageing trajectories by 2031 and lower-middle-income countries by 2078. Low-income countries, which currently have the world's youngest population, are estimated to experience the highest growth in the share of people older than 65 from one in about 30 people in 2021 to one in seven in 2100. Consequently, similar numbers of people aged 65 or over will likely be living in high-income countries (387 million) and low-income countries (317 million) by the end of this century. Most people aged 65 or over already are and will be living in today's middle-income countries (1.8 billion in 2100).

Populations are becoming older in all regions of the world. Between 1950 and 2021, population ageing has been fastest in Europe and Northern America, where the share of people aged 65 or over increased from 7.9 to 19 percent (+100 million) and from 8.1 to 17 percent (+50 million), respectively. Populations aged at a slower rate in Latin America and the Caribbean (3.2 to 9.0 percent, +54 million), Oceania (7.2 to 13 percent, +4.7 million), and Asia (4.2 to 9.4 percent, +383 million). Past population ageing has been slowest in Africa (3.3 to 3.5 percent, +41 million). Looking ahead from 2021 to 2100, the WPP 2022 projects the fastest growth rates in the population aged 65 or over in Latin America and the Caribbean (9.0 to 32 percent, +147 million) and Asia (9.4 to 29 percent, +922 million) followed by Oceania (13 to 27 percent, +13 million), Northern America (17 to 31 percent, +74 million), Europe (19 to 33 percent, +48 million), and Africa (3.5 to 24 percent, +521 million). Half of the population aged 65 or over is and will be living in Asia (441 of 761 million in 2021 and 1.4 of 2.5 billion in 2100) followed, in the future, no longer by Europe (144 million in 2021 and 193 million in 2100) but by Africa (48 million in 2021 and 569 million in 2100).

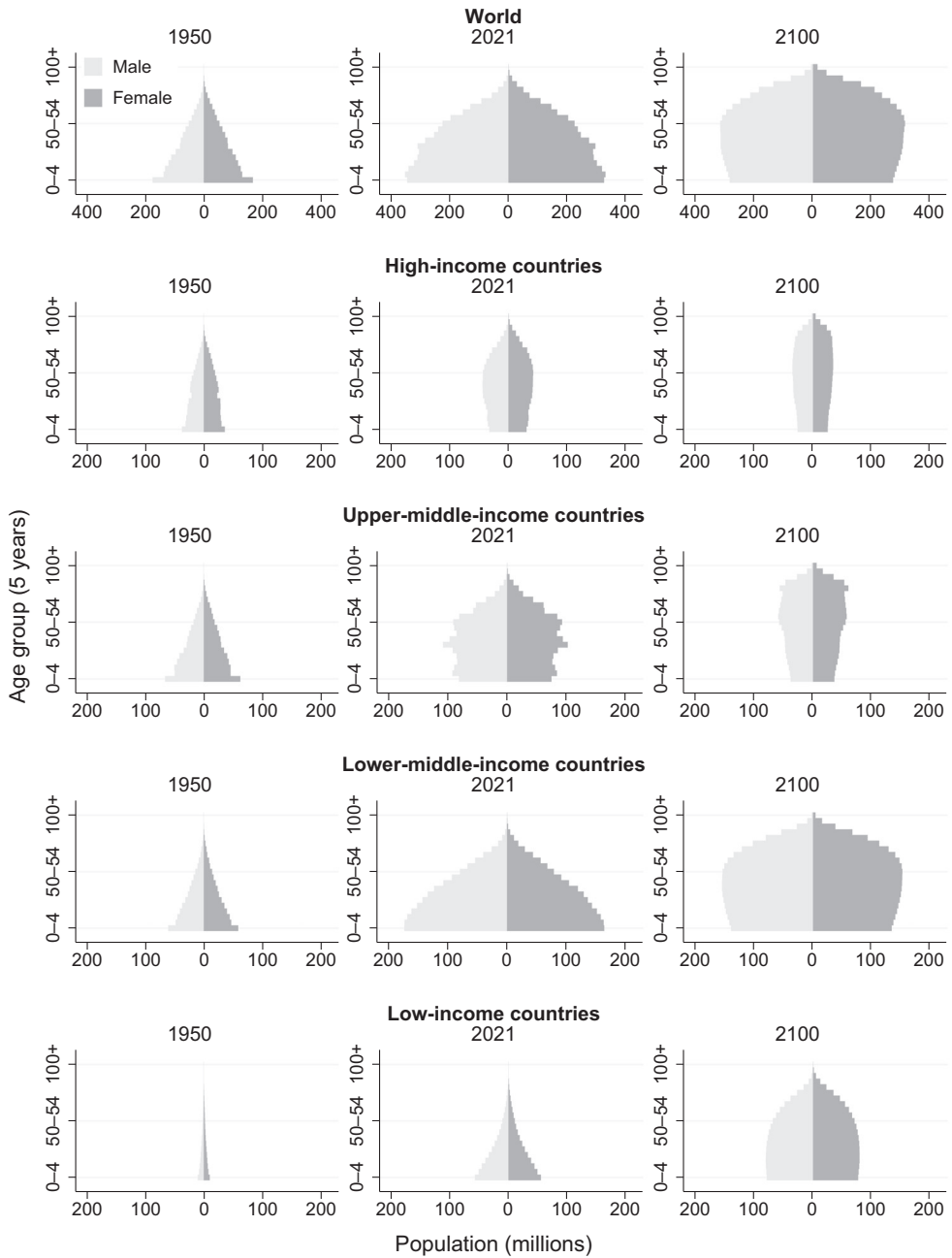


Figure 37.1 Past, present, and future population profiles by World Bank country groups. Note: World Bank country grouping by income level is based on gross national income per capita in 2021. Data source: 1950–2021 estimates and 2022–2100 medium-variant projections of the World Population Prospects 2022 (UNDESA, 2022).

### 37.3 Ageing Individuals

#### 37.3.1 Life Expectancy

While population ageing is determined by fertility, mortality, and migration, the chronological ageing of individuals is determined by mortality alone. Life expectancy is inversely related to mortality and often used as a widely available proxy for health (Table 37.1). Life expectancies at birth for the 18th and for much of the 19th century were estimated to be below 30 years in poorer regions of the world and below 40 years in less poor regions. Toward the end of the 19th century and in the first half of the 20th century, medical and technological progress together with wealth gains led to an unprecedented increase in life expectancy worldwide (Riley, 2001). On the one hand, increased knowledge of diseases and disease transmission, such as understanding that bacteria cause tuberculosis, enabled the development of effective hygiene and public health measures. On the other hand, the discovery of antibiotic therapy and vaccinations brought advances in disease treatment and prevention (Bloom et al., 2001; Wang et al., 2020). In addition, the general living conditions improved, and the development and spread of high-yielding crop varieties began. Between the 1950s and late 1960s, the use of high-yielding crop varieties in conjunction with mineral fertilizers, pesticides, and irrigation contributed to large increases in crop production and thereby improved the nutritional situation in many countries (Evenson and Gollin, 2003).

Life expectancy started to increase in the wealthier regions before it increased in the poorer regions (Figure 37.2). While individuals born in Africa in 1950 were expected to live 36.5 years,

Table 37.1 Common health metrics

<i>Health metric</i>	<i>Description</i>
Life expectancy	Life expectancy is the number of years a person can expect to live at any given age. This chapter reports estimates of the period life expectancy, which measures the number of years of life that a person is expected to live at a given age, given the mortality pattern at that time. Life expectancy can also be estimated ex-post as cohort life expectancy, which represents the mortality pattern of an actual cohort.
Healthy life expectancy (HALE)	Unlike life expectancy, HALE takes into account mortality and nonfatal outcomes. HALE does this by summarizing years lived in less than ideal health (YLDs) and years lost due to premature mortality (YLLs) in a single measure of average population health for individual countries.
Disability-adjusted life year (DALY)	A DALY is a universal metric that allows researchers and policymakers to compare very different populations and health conditions across time. DALYs equal the sum of years of life lost (YLLs) and years lived with disability (YLDs). One DALY equals one lost year of healthy life. DALYs allow us to estimate the total number of years lost due to specific causes and risk factors at the country, regional, and global levels.
Year lived with disability (YLD)	YLDs can also be described as years lived in less than ideal health. This includes conditions such as influenza, which may last for only a few days, or epilepsy, which can last a lifetime. It is measured by taking the prevalence of the condition multiplied by the disability weight for that condition. Disability weights reflect the severity of different conditions and are developed through surveys of the general public.
Year of life lost (YLL)	YLLs are calculated by subtracting the age at death from the longest possible life expectancy for a person at that age.

Source: Adapted from the Global Burden of Disease Study (IHME, 2022).

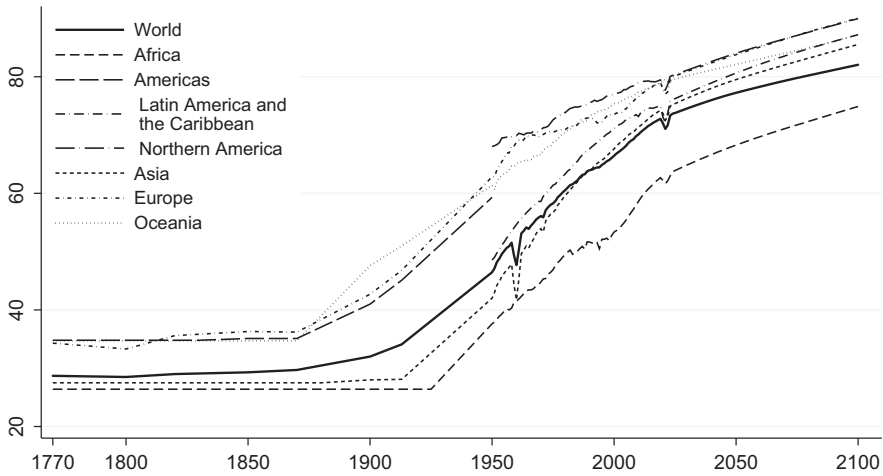


Figure 37.2 Life expectancy around the world, 1770–2100.

Source: Adapted from Our World in Data (Roser et al., 2019) and updated with 1950–2021 estimates and 2022–2100 medium-variant projections of the World Population Prospects 2022. Data sources: Riley (2005) and UNDESA (2022).

individuals born in Northern America at the same time were expected to live nearly twice as long on average, namely 68.2 years. Although life expectancy increased in both regions over the past decades, the rise was steeper in Africa, narrowing the gap between the two regions. In 2019, regional life expectancy ranged from 63.2 years in Africa to 79.2 years in Northern America. According to the WPP 2022 mid-variant projection, substantial regional life expectancy gaps will continue to persist for the years to come, and Oceania will fall behind other world regions in terms of future life expectancy increases. To a large extent, the past life expectancy increases can be attributed to declines in child mortality. Yet, mortality has also been declining among the elderly, especially in wealthier settings. Between 1990 and 2019, life expectancy at 65 increased for most countries and from 14.9 years to 17.6 years globally according to the GBD Study 2019. The largest absolute increase took place in high-income countries from 17.1 years to 20.5 years. Relative to the life expectancy at 65 in 1990, the change was largest in upper-middle-income countries, from 14.5 years to 17.5 years.

### 37.3.2 Healthy Life Expectancy

People live longer, and they live longer in good health (Figure 37.3). Healthy life expectancy at birth increased globally over the past decades, albeit to a smaller extent than life expectancy. Between 1990 and 2019, people gained both years in good health (6.8 years) and years in poor health (1.4 years). At higher ages, the remaining lifetime is more likely to involve health impairments. Globally, healthy life expectancy at age 65 increased by 1.9 years and the years in poor health by 0.79 years between 1990 and 2019. The prospect of living longer in good health at advanced ages differs within and between countries and world regions. In 2019, people at age 65 were expected to live on average another 13.9 years in good health in Europe. For elderly people in Africa, healthy life expectancy at age 65 was 10.9 years. Comparisons within the United Kingdom indicate a spatial variation of the healthy life expectancy at age 65 from 13.6 years in north-east England to 15.0 years in the greater London area in 2019. In Japan,

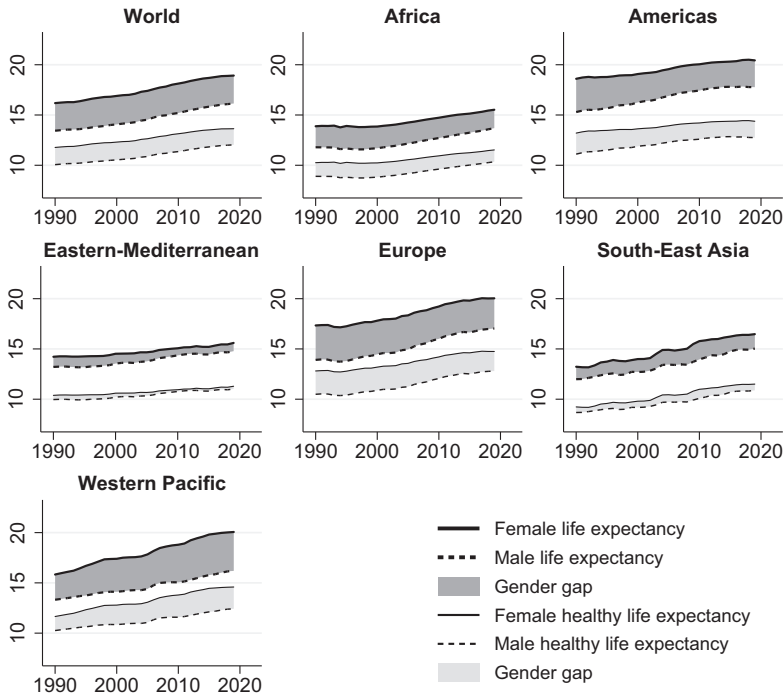


Figure 37.3 Life expectancy and healthy life expectancy at age 65 by World Health Organization region, 1990–2019.

Data source: Global Burden of Disease Study 2019 (IHME, 2020).

the healthy life expectancy at age 65 ranged from 16.2 years in Akita Prefecture to 17.7 years in Kyōto Prefecture. Disparities in the healthy life expectancy of elderly have been associated with income, education, area of residence, social support, gender, ethnicity, and other factors (Pongiglione et al., 2015). The disparities in life expectancy and health can be partially traced back to behavioral factors, such as smoking or diet (Mackenbach et al., 2019). Other contributors to life expectancy and health differences can be access to healthcare, exposure to external risks, and genetic predisposition (WHO, 2015).

Comparing the life expectancy of women and men at age 65, elderly women live longer than men (18.9 versus 16.2 years in 2019) and more years in good health (13.6 versus 12.0 years) globally and in all world regions. While women aged 65 live longer, they tend to experience more years in poor health than men—in absolute terms (5.3 years versus 4.1 years globally) and in relative terms (28 percent versus 25 percent of life).

### 37.3.3 Morbidities and Mortality among the Elderly

According to the GBD Study 2019, the top 10 causes of years lived with disability among people aged 70 or over, which accounted for 59 percent of all years lost due to disability, were age-related hearing loss (9.3 percent), diabetes (7.4 percent), low back pain (7.4 percent), blindness and vision loss (6.4 percent), COPD (6.2 percent), stroke (5.1 percent), Alzheimer’s disease (4.8 percent), falls (4.7 percent), osteoarthritis (4.4 percent), and oral disorders (3.7 percent). Noncommunicable diseases were the main causes of disability around the globe, but



their contribution to years lived with disability differed across countries. Sensory impairments ranked highest in low- and middle-income countries. Low back pain ranked highest in high-income countries. Alzheimer's disease was among the top 10 causes of disability only in high- and upper-middle-income countries (IHME, 2020). The relatively higher burden from sensory impairments in low- and lower-middle-income countries might be partly due to a higher exposure to risk factors, such as noise and sun. The relatively higher burden of Alzheimer's disease in upper-middle- and high-income countries might be partly due to an older population, larger awareness, and higher diagnosis rates (WHO, 2015).

The top 10 causes of years of life lost among people aged 70 or over, which account for 67.8 percent of all years lost to early death, were ischemic heart disease (20 percent), stroke (15 percent), COPD (8.9 percent), lung cancer (4.2 percent), Alzheimer's disease (4.2 percent), lower respiratory infection (4 percent), diabetes (3.2 percent), hypertensive heart disease (2.8 percent), chronic kidney disease (2.8 percent), and colorectal cancer (2.3 percent). Ischemic heart disease and stroke were the top causes of years of life lost across all country income groups, and COPD was among the top five. Lung cancer and Alzheimer's disease, in turn, were the top five causes of years of life lost only in high-income and upper-middle-income countries, whereas lower respiratory infections, diarrheal diseases, and tuberculosis ranked among the top five causes of years of life lost only in low-income and lower-middle-income countries (IHME, 2020).

### **37.4 Ageing and Other Megatrends**

#### **37.4.1 Chronic Conditions and Ageing**

Longer life expectancies and population ageing are globally shifting the causes of morbidity and mortality toward chronic conditions. Chronic conditions often progress slowly and have behavioral, environmental, or occupational risk factors that are known and modifiable. They can involve one or more physical health conditions and mental health conditions as well as combinations thereof. Several noncommunicable diseases are chronic conditions, but also communicable diseases can be or become a chronic condition (e.g., HIV under antiretroviral treatment; Figure 37.4). The prevention of chronic conditions and their long-term, often multidisciplinary treatment relies on functioning health systems and can create substantial funding needs in all settings. Furthermore, chronic conditions require a new understanding of health and the goals of care. Substantial gaps between the linkage to care for chronic conditions and care needs presently exist in countries facing the strongest growth in their elderly population. For example, cross-country studies of 44 and 28 low- and middle-income countries showed that only 74 percent of the population with hypertension were ever screened, 39 percent were diagnosed, 30 percent received treatment, and only 10 percent had their blood pressure under control (Geldsetzer et al., 2019). For diabetes, even fewer individuals were ever tested (63 percent), although slightly more were diagnosed (44 percent), treated (38 percent), and had their blood sugar levels under control (23 percent) (Manne-Goehler et al., 2019). Adding to the healthcare challenges for chronic conditions is the presence of multimorbidity, especially when different dimensions of health are affected, as healthcare was traditionally not designed to care for people with multiple and chronic conditions (Academy of Medical Sciences, 2018).

#### **37.4.2 Universal Health Coverage and Ageing**

Countries around the world have committed to achieving the Sustainable Development Goals by 2030. Target 3.8 of the Sustainable Development Goals is to achieve universal health coverage, including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all (UNGA,

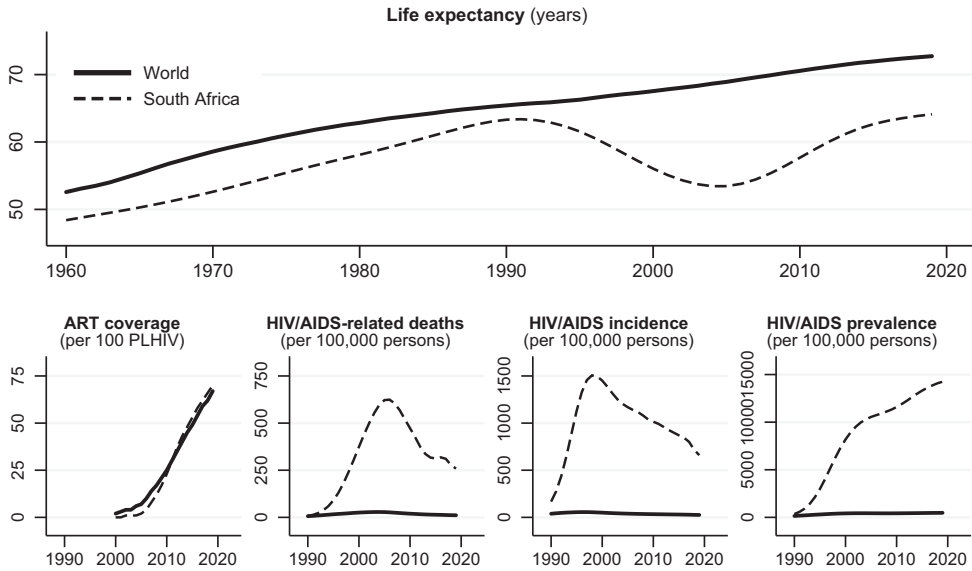


Figure 37.4 HIV/AIDS and life expectancy in the world and South Africa.

Note: ART = Antiretroviral therapy. PLHIV = People living with HIV. Between 1960 and 1992, life expectancy increased from 53 to 66 years worldwide and from 48 to 63 years in South Africa. As an AIDS pandemic was emerging in the 1990s due to the rapid spread of HIV infections and a lack of treatment options, the average life expectancy in South Africa decreased from 63 years to 53 years between 1992 and 2005. With the discovery of a combination therapy of at least three antiretroviral drugs to treat HIV infection in 1996, the mortality among people living with HIV on antiretroviral therapy decreased sharply and the number of people living with HIV increased while the HIV/AIDS incidence decreased. Due to the decline in new HIV cases and the expansion of antiretroviral treatment options, HIV/AIDS-related deaths declined significantly in South Africa since 2000. Another five years later, in 2005, the life expectancy of the population in South Africa began rising again. The life expectancy in South Africa recovered to the pre-epidemic level of 63 years in 2015, but the gap to the global life expectancy remained 9 years in 2019. While HIV/AIDS continues to be a major global health challenge, antiretroviral treatment transformed HIV/AIDS from an acute fatal disease to a manageable chronic condition. As people living with HIV age, HIV/AIDS is increasingly co-occurring together with other chronic conditions. Adapted from Kohler et al. (2021). Data sources: Global Burden of Disease Study 2019 (IHME, 2020) and World Development Indicators.

2015). According to the World Health Organization, universal health coverage includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care across the life course (WHO, 2021a). A study of 23 high- and middle-income countries found large variation in access and utilization of healthcare and substantial out-of-pocket expenses among the population aged 50 or over in 2014–2016. Estimated national rates varied up to tenfold for healthcare access, which was defined as any doctor visit, and threefold for potential overutilization, which was defined as 15 or more doctor visits and multiple hospitalizations. Catastrophic health expenditures, which were defined as 25 percent or more of household income spent out-of-pocket on healthcare, affected on average 9 percent (Macinko et al., 2020). Greater financial protection, reducing both overutilization and access barriers, which can co-occur, and better tailoring of health services to the needs of elderly people appears needed to achieve universal health coverage in this population.

### **37.4.3 Pandemics and Ageing**

Pandemics increase mortality and morbidity at multiple locations. Their health impact can differ by age. Data from 29 high- and upper-middle income countries indicate that the COVID-19 pandemic has increased mortality to an extent not experienced since World War II in Western Europe or the breakup of the Soviet Union in Eastern Europe (Aburto et al., 2021). Mortality increased across all age groups and most strongly for the elderly (Sasson, 2021). Other pandemics, like the HIV/AIDS pandemic prior to the broad availability of antiretroviral treatment or the 1918 influenza pandemic, increased mortality predominantly or also among younger and middle-aged people (Jahagirdar et al., 2021; CDC, 2019). Pandemics can affect mortality and morbidity not only directly but also indirectly. The COVID-19 pandemic, for instance, disrupted the treatment, care, and diagnosis of other diseases (WHO, 2020b; Michalowsky et al., 2021). While mortality recedes relatively quickly after the end of a pandemic or once its health impacts are mitigated, impacts on morbidity and population ageing can last longer. For example, the COVID-19 pandemic has lowered fertility in some countries (Aassve et al., 2021) and slowed down international migration (IOM, 2021) in addition to increasing mortality. All of these could affect population ageing in addition to morbidities from long COVID-19 beyond the end of the pandemic. Long-term effects of the HIV/AIDS pandemic on morbidity patterns, in turn, are already present. Antiretroviral treatment of HIV allows suppression of AIDS and prolongs survival. As people are ageing with HIV, multimorbidity involving HIV/AIDS is increasing among elderly people in settings with a high HIV prevalence. Understanding to which extent pandemics interact with ageing will help to respond to immediate and long-term pandemic impacts and to prepare for future pandemics that will affect older populations.

### **37.4.4 Climate Change and Ageing**

Climate change can affect health more or less directly, for instance, through increasing the risk of natural disasters, enlarging the habitat of disease vectors, or increasing food and water insecurity (IPCC, 2022). Age co-determines the vulnerability of individuals and populations to some impacts of change climate. Health problems and deaths during heat waves occur, for instance, more often in elderly people (Ebi et al., 2021). In the context of heatwaves and natural disasters, elderly people can have an increased morbidity and mortality risk, first, through the disaster; second, through disruptions in the healthcare system; and third, through mental distress (Frankenberg et al., 2020; Man et al., 2018; Prohaska and Peters, 2019). Attempts to mitigate the health impact of heatwaves include the development of heat-health action plans. These plans can include new or improved approaches to push information on heatwaves, preparations, and safety measures to individuals and healthcare facilities. Heat-health action plans continue to be work in progress, incomplete, or missing, but preliminary evidence suggests that they can help reduce heat-related mortality among elderly people (Niebuhr et al., 2021). In the years ahead, an increasing number of elderly people will belong to the populations that are most vulnerable to some impacts of climate change.

### **37.4.5 Migration and Ageing**

Migration can affect population and individual ageing. First, migration can affect the age of the population in the country of origin and at the destination of migrants. In 2019, nearly three of four international migrants were estimated to belong to the working-age population aged 15–64 years (UNDESA, 2019). Given that the destination country is often a country with a higher income and an older population than the country of origin, migration can induce population ageing at the country of origin and a rejuvenation at the destination country. Second,

migration can affect an individual's chances for healthy ageing. For those who migrate to a wealthier destination, better income, a healthier environment, and prospects that one's children will do well can be conducive to healthy ageing. In turn, migration can increase health risks if migrants have restricted access to healthcare or face informal barriers to using health services. Studies from Europe indicate a higher disease burden for older migrants compared with the native population, with a widening gap as individuals age (Reus-Pons et al., 2018). For elderly relatives who wanted or had to stay behind, remittances sent home by migrants can be a financial inflow that helps to cover expenses for healthcare and other needs (Adams, 2011). However, living alone can be a risk factor for common health problems at an higher age, like frailty and dementia (Kojima et al., 2020; Desai et al., 2020). Third, migration of medical personnel impacts healthcare systems and thereby the opportunities for healthy ageing. Migrating health workers increase the supply of skilled labor in the destination country and reduce it in the country of origin. In member countries of the Organisation for Economic Co-operation and Development, for instance, the proportion of foreign-born doctors rose from around one-fifth in 2000/2001 to more than one-quarter in 2015/2016 (Socha-Dietrich and Dumont, 2021). Health worker migration causes or aggravates existing shortages of skilled health professionals in several low- and middle-income countries (WHO, 2021b). Yet, remittances and other benefits can occur in countries of emigration. The prospects of working internationally can increase the perceived returns to a medical education and attract more people to medical training than will migrate (Abarcar and Theoharides, 2021). International labor mobility might facilitate knowledge transfer, including the transfer of knowledge on geriatric and chronic disease care.

#### **37.4.6 Family Structures and Ageing**

Family structures and thus the living arrangements of many elderly people are changing. This can have consequences for individual health as well as the healthcare system. Traditionally, older people lived with their children or extended family. Now globally more and more elderly live alone or with their spouse. The trend for elderly to live separate from their adult children is more advanced in wealthier countries, but not limited to those. It is related to life-style changes, urbanization, and work-induced migration. In some countries skipped generation households are also common, in which grandparents raise their grandchildren as their adult children are absent or dead, for instance, related to migration, conflicts, or the HIV pandemic (UNDESA, 2020). Living arrangements, specifically living in the physical proximity of relatives can strengthen the functional ability of elderly people through mutual support, informal care, and social contacts. In turn, when relatives are absent, by choice or related to external factors, more support through the healthcare system is needed. Understanding for different contexts how family structures change and affect the elderly, how age-friendly environments can support independence, and when family members would provide care can help promote healthy ageing and prepare for ageing as family structures change.

#### **37.4.7 Ageing in a Digital World**

Globally, 4.9 billion people, or 63 percent of the world's population, used the Internet in 2021 according to estimates by the International Telecommunication Union (ITU). This represents a doubling of the number of Internet users over the past 10 years, which was 2.4 billion people or 34 percent of the world's population in 2012. The share of Internet users was highest in Europe (87 percent) and lowest in Africa (33 percent). The growth in the share of Internet users is now fastest in low- and middle-income countries. There is a large divide based on age. Among the world's population aged 15–24, 71 percent use the Internet compared to 57

percent of the rest of the population. The age gap in internet use is larger in countries with lower incomes than in countries with higher incomes (ITU, 2022). Increasing Internet access together with other digital technologies can help maintain contact over distance, collect health information, provide telemedicine, or monitor falls and other adverse health events. For instance, remote health monitoring might allow living support on demand for elderly people who would otherwise feel uncomfortable to live independently. Regular or real-time data collection might allow for pre-emptive support and early discovery of a health problem, like an aggravating chronic condition or dehydration. In addition, day-to-day business, like shopping, banking, participating in the labor market, or lifelong learning, might be conducted digitally rather than through physical presence where stable and affordable Internet access is available. As Internet access and digital literacy grow globally, several potential benefits of digitalization could be ahead for ageing people. Presently, Internet use among elderly is widespread only in few countries (UNECE, 2021).

### **37.5 Opportunities and Challenges for an Ageing World**

Longer life expectancies worldwide provide an opportunity for individuals to live longer in good health and for societies to benefit from members who can be active longer. Longer healthy life expectancies in countries with higher incomes and for individuals with better socioeconomic status indicate substantial disparities in ageing. The longest healthy life expectancies point to what could be reachable for those living shorter lives or ageing less healthily. While health at older ages is determined over the whole life cycle, maintaining or regaining functional ability and satisfaction after health deteriorates often remains feasible even at higher ages. Until today, however, many aspects of health at older ages and healthy ageing around the globe are subject to knowledge gaps. First, data to assess health by age are sparse or missing for many countries. Consequently, existing age-specific global health assessments, most notably the Global Burden of Disease Study, rely heavily on data extrapolation and modeling. The past years saw an increase of nationally representative, multicountry surveys focusing on the elderly, like the WHO Study on Global Ageing and Adult Health or the Survey of Health, Ageing and Retirement in Europe. Nevertheless, more data on elderly populations and ageing are needed, especially for low- and middle-income countries. Second, a variety of concepts is used to assess health and well-being, including healthy life expectancy, functional ability, frailty, or health-related quality of life. Using different concepts allows to explore health and well-being broadly or to focus on aspects of increased relevance at older age, like functional ability or frailty. Yet, the range of concepts and measures used affects the comparability of data. Collecting comparable data that captures context- and culture-specific implications of ageing thus remains a challenge. Third and relatedly, there is a lack of standardized data on chronic conditions and multimorbidity. Future research could aim to close data gaps, enhance our knowledge and understanding of ageing over the life cycle, and provide guidance on how health systems can prepare for ageing societies in different contexts. Healthcare systems face the challenge to increasingly care for people who will live longer and for people who are older. As health risks can accumulate and aggravate over time, early prevention and treatment will often play a key role for healthy ageing. To respond to these challenges, healthcare systems need to expand their services and reorient toward health promotion, disease prevention, and multidisciplinary care for multiple chronic conditions. These challenges are faced by countries around the world irrespective of their income level. Low- and middle-income countries might be particularly affected, as they are experiencing fast changes in the disease burden and in the number of ageing individuals. While their younger populations only start to age, there are often larger health coverage gaps and fewer structures for preventive

and multidisciplinary care. Strengthening healthcare for elderly people within the quest for universal health coverage can be an opportunity to improve population health and to prepare for an ageing world, in which individuals can age healthily, stay productive, and be independent longer.

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