

# Planning for Global Population Ageing

Report for

Economic Analysis and Policy Division  
United Nations Department of Economic and  
Social Affairs

12 May 2022



**RUTGERS**

Edward J. Bloustein School  
of Planning and Public Policy



**United  
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Department of  
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The world is greying. There are more older adults aged 65 and above today than children under the age of five. One in five adults will be a senior citizen in another three decades. This ‘inverted age pyramid’ poses significant challenges to economic growth and social cohesion. As the working-age population shrinks and dependency rises, gross domestic product and employment rates may experience a severe decline. Underneath this umbrella effect is a range of factors contributing to an aging economy's detrimental effects – a fall in production and consumption levels, increased health and pension expenditures, and an overburdened yet shrinking revenue base. On the social side, changes in the societal composition of young and old will affect behavioral dynamics at all stages of life and cultural adaptation. Climate change and a warming world will further exacerbate the woes of a greying world. How can nations prepare for a demographic shift to an aging economy and society in this context?

As the quest for sustainable development pushes nations to reinvent their economic, social, and environmental goals, it is also an opportunity to rewire the potential of the emerging demography. Declining fertility and mortality rates cause aging. There is also a global increase in life expectancy, or longevity, as a direct outcome of advances in medical knowledge and care and improvements in the living environment. While aging focuses on changes in population structure, longevity has significant implications on how individuals age and capitalize on life expectancy gains. Examining the longevity patterns in an economy can offset the effects of aging. It may also reduce non-linearities that can narrow the impact of aging to a confined threshold.<sup>1</sup> Yet, if the increased lifespan isn't healthy and productive, longevity gains will not be beneficial. Without focusing on healthy living, aging will lead to an increase in ailments and disabilities in the older population. To this effect, the report identifies crucial links to planning for longevity and healthy aging.

The economic drivers of production and consumption are the two principal factors. Combined, they examine the role of productivity, technology, and accumulation in an aging economy. The shrinking effects of the working-age population on economic production, observed through falling levels of employment and labor force productivity, can be offset by three essential policy measures – delaying retirement, technology/automation, and planning for healthy aging. Aging raises questions about the sustainability of the current working life models and care provision. Extending working lives commensurate to increased life expectancy can keep the labor force populated and provide additional resources to finance social programs. This should be planned well in advance and with consistent public discussion, with a view to protecting those that do not live as long – lower-income individuals and those working in manual labor. Whereas prolonging

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<sup>1</sup> E.g., the impact on healthcare, wellbeing, pensions funding, consumption, etc.



careers can solve this immediate issue, it risks "skill obsolescence". Workforce policies will have to find a delicate balance between the market's demand and supply.

Education policy needs redesigning to enable lifelong learning on the supply side. Increased participation of women and the elderly in the workforce complemented by skill development training will be a crucial policy measure. Higher penetration of digital skills complemented with technology, robotics, and automation, will tremendously improve per worker productivity levels. From a behavioral economics perspective, aging has profound implications for how each stage of life changes and adapts to longer lives, be it around education, work, marriage, fertility, or retirement. On the demand side, remaining economically active will require incentivization, such as increased health benefits for older adults choosing to work beyond the minimum retirement age. Pension and welfare reforms will also considerably drive retirement decisions. Pension strategies such as tax credits, micro-pensions, universal basic income, and a tiered pension system with built-in flexibility will further help in futureproofing against economic recession caused by aging. Increasing formalization and productivity levels will go a long way in improving GDP and growth potential.

As consumption patterns change to complement the altering age structure, the silver economy will, on the one hand, present the opportunity for wealthier consumption due to savings. On the other hand, it risks outliving one's savings with longer lives. In economies where average life expectancy is still increasing, delaying pensions or retirement may not be suitable. Longevity will thus require redressal through accounting for age inflation and using prospective aging in designing work-life policy and social security nets.

Low and middle-income countries have limited public or private pension and healthcare coverage. Financing in these countries is crucial in defining the stability of future regional economic growth. We investigate the short-term structural and financial reforms within the economic structure of each nation. As suggested through our research, these reforms should focus on alternative tax revenues and foreign direct investment strategies.

To promote healthy aging, increased investment in preventive healthcare rather than curative healthcare will go a long way in addressing age-related morbidities, reducing overall healthcare expenditure.<sup>2</sup> The need for primary prevention, or averting disease onset, and secondary prevention, or early disease detection, can be facilitated by setting health targets for a salubrious lifespan, similar to setting carbon emission targets to measure climate change impact. For tertiary prevention, which deals with rehabilitating those that have suffered significant illness or aging, the concept of "aging in place" and age-tech will help improve quality of life.

Aging is not just confined to the developed world. The low- and middle-income nations are seeing a much more rapid rate of senescence than the high-income nations. Further, the developing countries have a precarious juggling act of balancing their economic development priorities with

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<sup>2</sup> Curative healthcare tends to cost more than preventative healthcare.

the rising social and health infrastructure issues, compounded by the complications in managing climate change. As nations transform differentially towards the aging curve, it is essential to threadbare its effects in a representative set of countries reflecting the ground truth. It is primarily for this reason that this study has chosen the nations of Japan, the People's Republic of Bangladesh, and the Federal Republic of Nigeria to deep dive into the effects of aging on the various identified factors.

Policies and institutions will significantly determine the opportunities and socio-economic resilience of the changing world. As nations transcend the demographic ecotones, they need to tap on this brief window of opportunity to set their policies right. Healthy longevity can effectively reverse the challenges of aging. This report brings together a thorough analysis of trends in aging and identifies the most critical policy implications for decision making and increasing the world's resilience to aging.

# 1. Introduction

Liliana Ordóñez

The world's population is aging across all countries (Figure 1.1). In contrast to previous decades, this phenomenon is no longer exclusive to developed countries that have been experiencing it since the 1980s (Our World in Data, 2019). Several studies show that the share of people 65 and older is increasing in low and middle-income countries (Mason, Lee, Abrigo, & Lee , 2016). One of the main concerns is that aging is approaching low- and middle-income countries even faster than high-income countries. Indeed, by the end of the century, the median age is estimated to reach 41 years old for the lower-middle-income countries, while high-income countries will have a median age of 48. The median age gap between low- and high-income countries will be seven years in 2100, while in 2020, it was 21 years. Between 1950 and 1980, the percentage of older adults in the total population remained around 7%, while in 2000 it rose to 10%. Under projected trends in global demographic aging, it is estimated that in 2030 this percentage will increase to 16.6% and in 2050 to 21.4%. In other words, while in 2000, one in ten people in the world was an older adult, it will be one in five by mid-century.

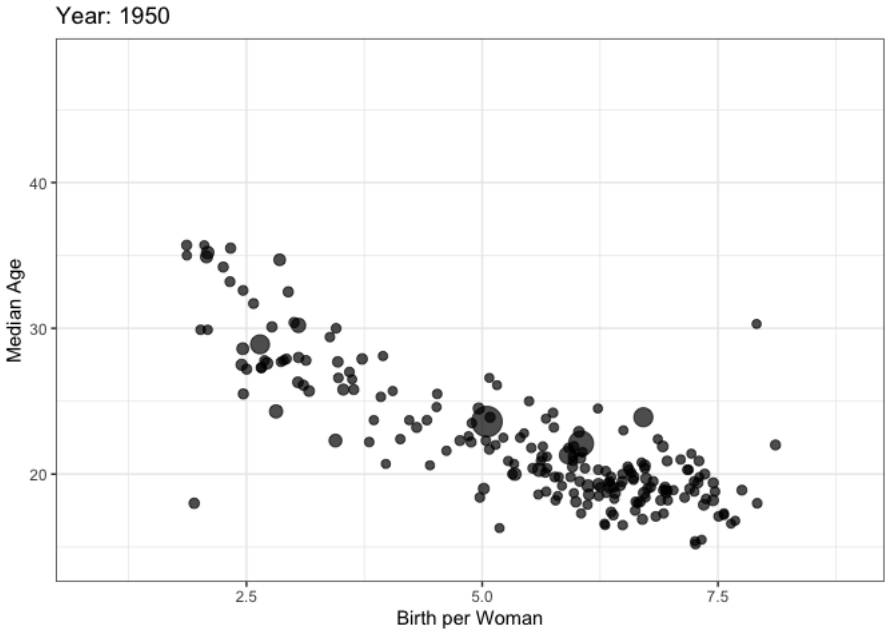
Figure 1.1: World's population Pyramid (2020 vs. 2100)



Source: Author's calculations based on UN World Population Data 2019

Behind population aging are two principal demographic drivers: fertility rate and survival rate. The decrease in fertility rate and the increase in survival rate explain why the world's population is aging. As global health is improving and mortality is falling, people today are expected to live longer than any generation before us. In the same vein, the role of women in the labor force has promoted fertility rate reductions, slowing population growth. As mentioned before, virtually all countries in the world are aging. However, they are at different stages of the demographic transition, meaning that they have different fertility and life expectancy rates. This document aims to show how to plan for an aging society knowing that not all countries are at the same stage of demographic change, as shown in Figure 1.2.

Figure 1.2: World Countries' Median Age vs. Births per Women (1950 –2020) \*



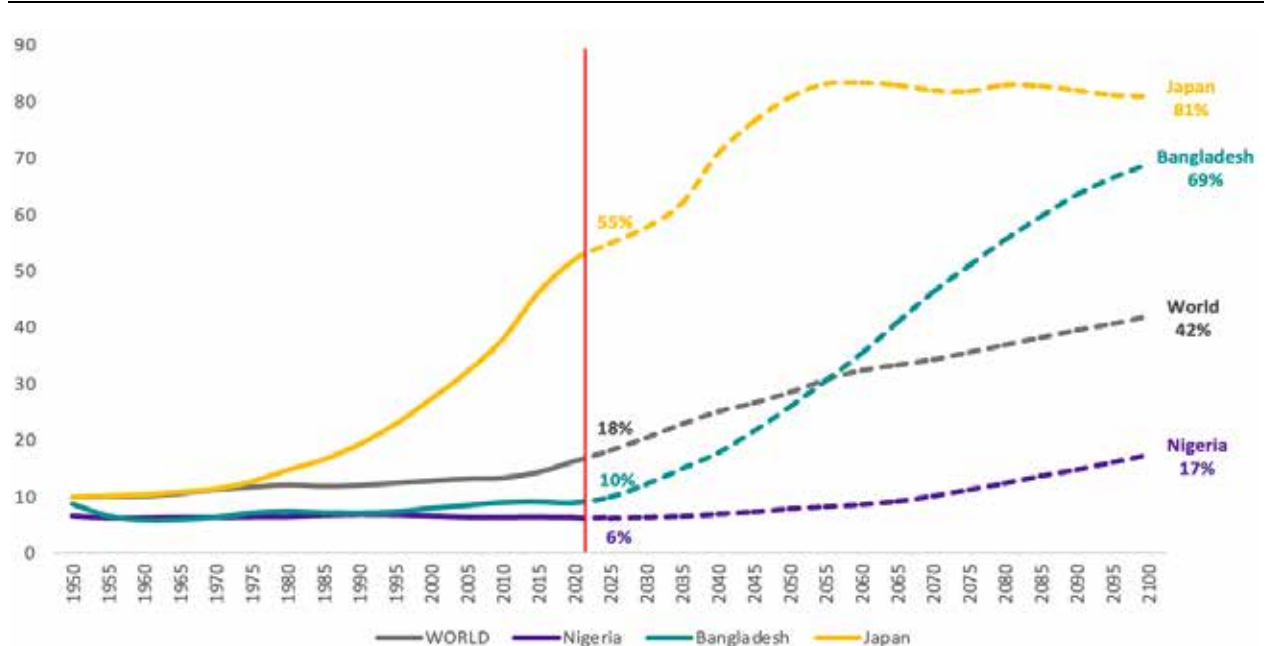
\*Each dot represents a country in the world. Its size varies according to the country's population

Source: Author's calculations based on UN Population Division Data

Concerns about the social and economic implications of an aging population are better understood through the Life Cycle Theory of Consumption. According to this theory, rational agents (people) plan their consumption and savings behavior during their life, accumulating money when they are young (25 to 64 years old) and dissaving when they are retired (65+). The life-cycle hypothesis remains an essential part of economists' thinking and has several implications for making public policy decisions. One of the main conclusions of the theory is that if there are more young people than old, more people are saving than dissaving. Consequently, the global saving of the young will be greater than the total dissaving of the old, and there will

be net positive savings—a desirable situation in macroeconomic terms. The opposite scenario, i.e., that the proportion of older adults is greater than the proportion of young people, would imply that the world, as a whole, is dissaving. This translates into significant pressures on the economic apparatus of the countries. A scenario where the majority of the population are dissaving is of concern to policy makers. The old age dependency ratio expresses the relationship between two age groups within a population: "working age population", defined as people between ages 16 and 64 and retired at 65-plus. Higher values indicate a greater level of age-related dependency in the population. The "dependent population" is defined as people aged 65-plus. As Figure 1.3 shows, the proportion of the dependent population is expected to increase considerably by the end of the century.

Figure 1.3: Old Age Dependency Ratio (1950–2100)



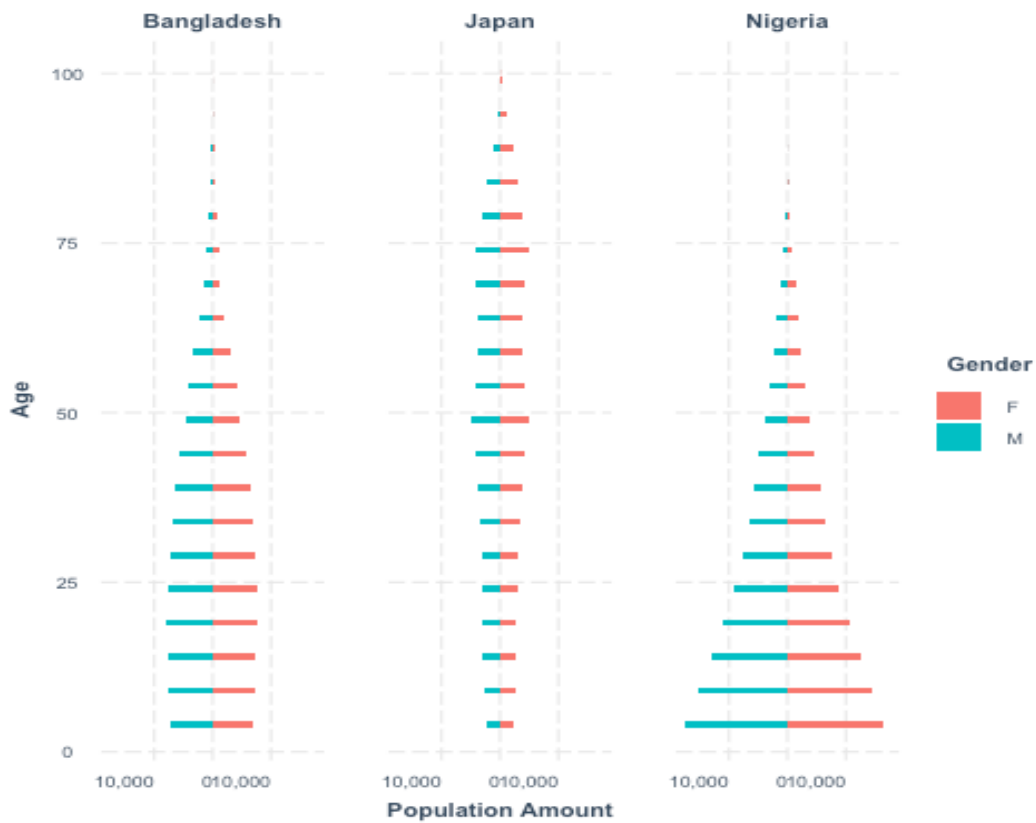
\*The dotted line represents the estimates of the UN  
Source: UN Population Division Data

To better understand the implications of living in an aging world, this report aims to analyze three countries that are at vastly distinct stages in the demographic transition: Bangladesh, Japan, and Nigeria (see

Figure 1.4). Japan's fertility rate has declined since the 70s. To date there are 1.36 births per woman, a figure well below the world rate (2.4). In terms of survival, life expectancy in the country is 85 years old, above the world average (73 years old). In contrast, Bangladesh has experienced a surprising and accelerated demographic change due to the reduction of the fertility rate (see Figure 1.5). This change can be driven by distinct factors such as female

education and labor participation, reductions in child mortality and economic development (World Bank, 2020). In 1980, the fertility rate of the country was 6.4, by 2020 it was 2.01, a number below the world's average. Life expectancy in Bangladesh increased from 53 in 1980 to 73 in 2020. In the case of Nigeria, the fertility rate has decreased, but at a much slower rate than in Bangladesh. Indeed, in 1980 there were 6.8 births per women and by 2020 the figure decreased to 5.3. The life expectancy increased from 45.8 years old to 54.7.

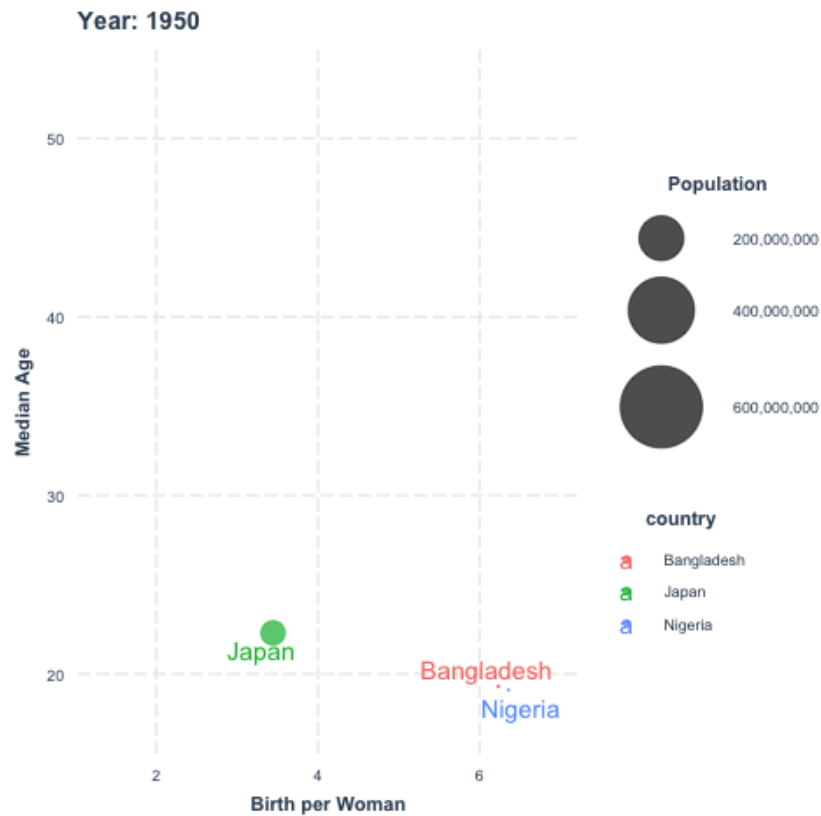
Figure 1.4: Bangladesh, Japan, and Nigeria Population Pyramid (2020)



Source: UN Population Division Data

Figure 1.5: Median Age vs. Births per Women (1950 -2100).

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Source: Author's calculations based on UN Population Division Data

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This document is divided into ten chapters, this introduction and the main conclusion. Chapter 2 is a country profile of the three cases of study: Bangladesh, Japan, and Nigeria. Chapter 3 focuses on understanding the shrinking effects of the working-age population on economic production, observed through falling levels of employment and labor force productivity. Moreover, this chapter will discuss the untapped potential of the longevity economy. Chapter 4 explores inclusive and lifelong learning as an intergenerational solidarity strategy. Education policy needs redesigning to enable lifelong learning on the supply side. Increased participation of women and the elderly in the workforce complemented by skill development training will be crucial. Chapters 5 and 6 analyzed the alternative to improve public finance and personal consumption from two perspectives. Finally, chapters 7 through 10 aims to understand the promotion of healthy aging through implementing preventive healthcare policies rather than curative healthcare.

## 2. Country Introductions

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### 2.1. Japan

*Astha Negi, Richa Rashmi, Xuedi Yan*

#### 2.1.1. Introduction

At the end of World War II, Japan stood defeated and tattered to its very core but there was an opportunity for its people to start afresh. By accepting the 'Potsdam Declaration' in 1945, Japan was subordinated to United States (US), which assumed complete administrative control of the country. The US wrote the constitution for Japan in 1946 and initiated a series of reforms that formed a bedrock for Japan's economic take-off. It was only in 1951, when Japan signed the 'San Francisco Treaty' it regained its sovereignty again. Japan chose to be a constitutional monarchy with a parliamentary form of government wherein the emperor is the chief of state and prime minister is the head of government, which continues to this day. One major implication of American occupation was not just the stationing of American troops in Japan but also disbanding of the Japanese army (Beckley, Horiuchi, & Jennifer, 2018). This led to significant budgetary reduction in defense spending and along with the American patronage that came, resources were completely put to economic and social use in Japan. And in the years that unfolded, Japan rose to great economic heights at least until 1990, whereafter it slowed to never recover again to its 1960-1980 glory. A lot of what has transpired since 1951 until now lies in the social, economic, and demographic story of Japan, which this report intends to deal with in greater detail.

Japan's economic ascendance brought it to international prominence and it soon became the most important Asian economy that was founding member of OECD in 1964 (OECD, 2014), member of G7 in 1975 (IMF, 2022), part of APEC in 1989 (APEC, 2021) among many other regional and international cooperation organizations. Located in the west of the Pacific Ocean in the Northern Hemisphere and neighbored by Republic of Korea, China, and Russia, the island nation is one of the most economically developed countries in the world. It has an area of about 377,975 square kilometers, making it the 61<sup>st</sup> largest nation (Government of Japan, 2021) and includes four main islands—Hokkaido, Honshu, Shikoku, and Kyushu—and some 7000 smaller ones, as shown in Map 2.1. Japan has a rugged topography, with ecological niches that can sustain relatively large populations of which the Kanto Plain, location of present-day Tokyo, is the largest.



Map 2.1: Japanese prefectures and regions

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Source: (VectorStock, 2022)

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Japan started to urbanize in 1920s and today is one of the most urbanized nations in the world with more than 90% of its population dwelling in urban areas. Since Japan had a geography constrained by oceans and perilously active volcanoes, centers of development were limited in the country, so much so that population tends to be concentrated in few cities only. It housed the first megacity of the world, Tokyo in 1950, (World Population History, 2022), which continues to remain the ‘world’s largest urban agglomeration with 38 million inhabitants.’ Even though projections indicate a slight fall in Tokyo’s population by 2030, it will still be the world’s most populous city with 37 million inhabitants (United Nations, 2018).

Geographical isolation also has a cultural underpinning. One, it kept the nation agnostic to any military conquest from the mainland invaders that could have imposed dramatic changes in Japan’s history and second, the isolation has created a fertile ground for cultural borrowing from the mainland which has percolated at an even pace and adjusted to suit the vernacular practices of Japan’s culture.

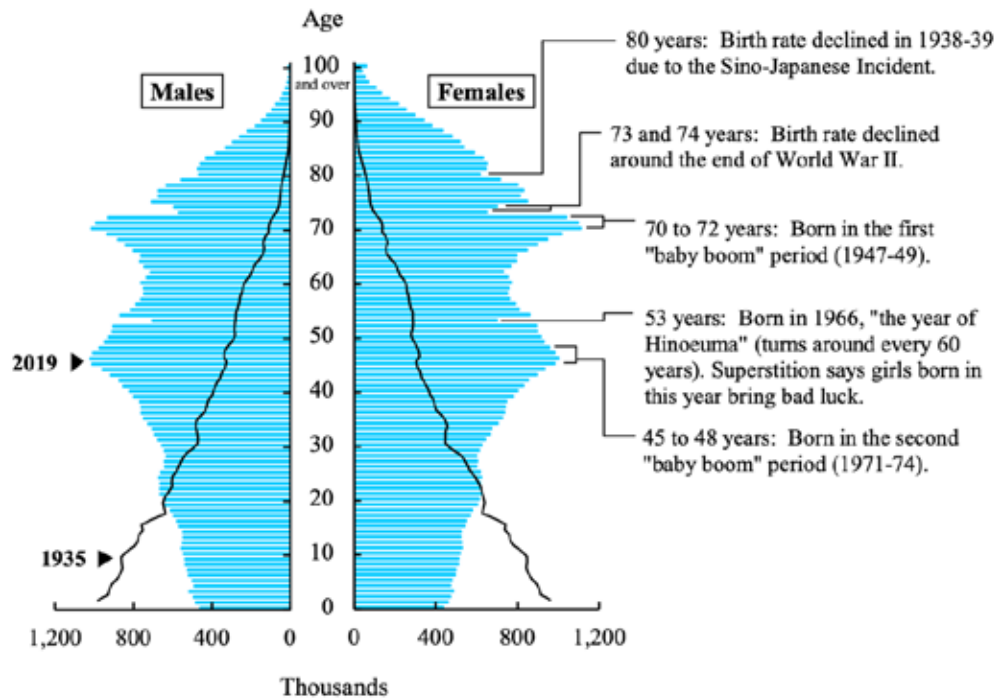
### 2.1.2. Demographic Trends

Japan's total population was 125.71 million in 2020 making it the 11th most populous nation and constituting about 1.6 percent of the world's kilometers (World Population History, 2022).

For a century, Japan maintained a steady population of about 30 million, which only started expanding after Meiji's restoration in 1868. During this phase, Japanese trade grew manifold, resulting in the shift from an old feudal system to a more modern society. Its demographic transition from 1868-1920 was fueled by an era of industrialization and urbanization. In 1912, the population crossed 50 million and continued to climb steadily surpassing the 100 million milestone in 1967, which was supported by advances in science and technology that helped fight diseases and morbidity, keeping the mortality rates low. Thereafter, the growth rate slowed down to 1% between 1960-70. The rates fell sharply since 1980. The population peaked in 2007 at 128 million and has ever since been on a decline. Between the census in 2010 and 2015, Japan's population fell by 962,607 people, which marked the first population decline since the census was started in 1920. As per Census 2020, the population of Japan stands at 125.71 million, down by 0.46 million from 2019 (Statistics Bureau, Japan, 2021).

The total fertility rate (TFR) in Japan is 1.37, putting it in the 'lowest-low' fertility rate nation category of OECD, which averages a TFR of 1.74. Two major reasons behind the falling fertility have been linked to '*shoshika*', which in Japanese means a trend towards having fewer children and '*koreika*', which means aging. The average mothers' age at first childbirth rose from 25.6 years in 1970 to 30.7 years in 2020. Even marriages are severely delayed in the Japanese context; the mean age of first marriage for grooms was 31.0 and for the brides was 29.4 in 2020. Additionally, the number of married couples as well as the marriage rate has fallen from 1 million and 10.0 respectively in 1970 to 525,490 and 4.3 respectively in 2020. The declining birth rate is thus explained by the fall in marriage rate, rising marrying age and increased choice of unmarried life among the Japanese in recent times. Further, the death rate between 1975 – 1987 was steady at 6.0 - 6.3 and has been trending upward since 1988 reaching 11.1 in 2020, which reflects the population ageing (Statistics Bureau, Japan, 2021).

Figure 2.1: Population Pyramid of Japan, 2020



Source: Statistics Bureau, Government of Japan

The average household size in Japan is 2.33 in 2015, falling from 3.41 in 1970 and further from about 5 in 1950. There were about 53.3 million households in Japan in 2015, of which 56% are nuclear families. This reflects the increasing nuclearization of families even though the old and dependents continue to rise. A finer look at the elderly households reveals that about 40% of the total households, or 21.71 million belong to households with members aged 65 years old and above. Out of this, 5.93 million people alone were one-person elderly households. An increase in the elderly population is a direct result of higher life expectancies, which mounted sharply after World War II, and in 2019 was 87.5 years for females and 81.4 years for males, setting a record for all genders. A better quality of life for Japan's elderly and regular health checks are two reasons why Japan has one of the highest life expectancies in the world (Statistics Bureau, Japan, 2021).

### 2.1.3. Economic History

#### *Production from a historic lens*

Japan was an envy of the world in the postwar period with a booming economy registering double-digit growth, sizeable trade surplus, extraordinary industrial transformation, and almost negligible unemployment. Between 1950-1960, an alliance of policymakers and industrialists adopted an export-led growth model for Japan, massively investing in the domestic market,

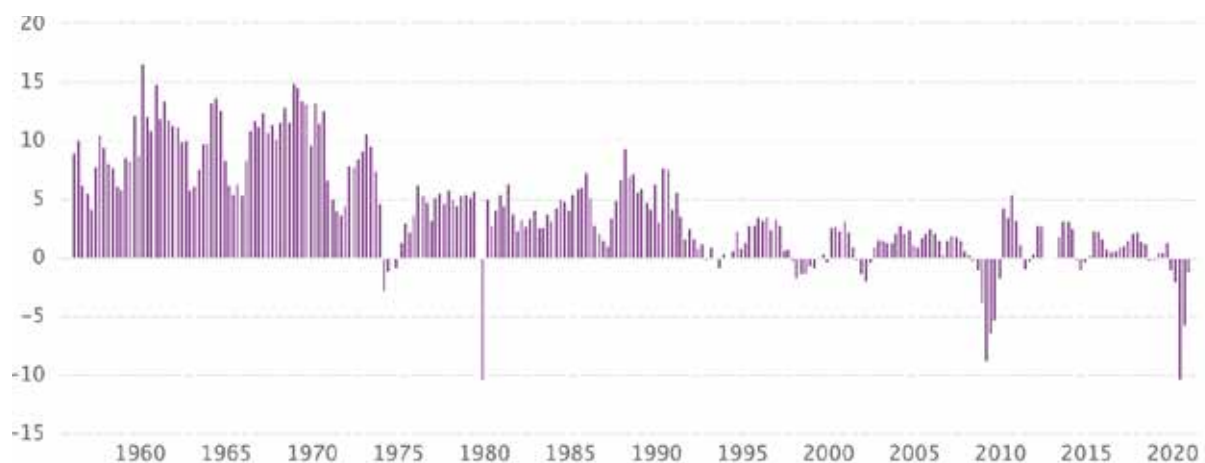
foreign technology acquisition and putting in protectionist policies, which ascended Japan to a miraculous growth path. The period also saw tremendous labor force migration from the primary to secondary sector and an expansion in industrial capital by private investors, backed by high rates of personal savings (Statistics Bureau, Japan, 2021). Average real GDP growth between 1960-1973 was 9.6% annually, compared with 4.9% of OECD nations (OECD, 2004). The oil shock of 1973 deaccelerated growth momentum to a negative for the first time. By the second oil crisis of 1978, Japan's industrial structure minimized the oil import dependency and shifted from "energy-dependent" to "energy-saving" economy, thus fostering an average of 4.0% growth annually between 1973-1989 (OECD, 2004). It was also in 1973 that Japan adopted a floating rate exchange system, foregoing the earlier valuation of yen against the US dollar. In the 1980s, the trade imbalance with advanced industrial countries expanded because of the yen's appreciation. By the early 1990s, the growth trend took a dip and fell into recession, initiating the period of weak economic activity, high inflation, banking failures and bankruptcies, and rising levels of unemployment (Beckley, Horiuchi , & Jennifer, 2018).

Although Japan caught up with the technological success of leading industrial economies and championed many leadership positions in international economy, between the 1991 - 2005 period its real GDP growth stagnated to an average of only 1.5%, about half of rest of the OECD economy, in the aftermath of inefficient investments and an asset price bubble of late 1980s (OECD, 2004). Infusion of excessive funds into real estate and stock market caused an abnormal rise in capital asset values forming an economic bubble at the end of 1990. The beginning of 1990 saw a sharp plummeting of stock prices and land values. Since Japan's economic and financial systems were highly dependent on land, decline in land prices eventually led to the collapse of bubble economy (Government of Japan, 2021). Accumulation of bad debts due to this collapse created non-performing assets for corporate loan portfolios, which in turn withered the shareholders' equity in financial institutions. By 1997, large banks began to collapse, which prompted the government to inject public finance to stabilize the banking system. This period was infamously described as the "lost decade" for Japan. Japan continued to register a modest growth momentum since then, fueled by mostly government stimulus spending. However, this period of growth was short-lived and by 2000, drop in Asian demand for IT goods and services, created excessive inventory stockpile for Japan's export goods. Compounded with the tsunami of 2011, Japan again contracted only to be recovered by the introduction of 'Abenomics' in 2012 (Andressen, 2003).

In the Abenomics strategy a three-pronged approach was adopted to counter deflation and stagnating economic growth namely, bold monetary easing, flexible fiscal policy management and an inclusive growth strategy that promoted innovation, female workforce participation and allowed more immigration workers, among others (Sheard, 2020). The economy was quick to respond in registering an upward trend in annual GDP growth measured at 2.6% in the fourth quarter of 2013. This was driven mostly by revision in yen valuation and reforms in corporate tax system (Abe, 2014). Despite the reforms, Japan continued to slump, registering a real growth rate in 2018 of 0.8%, down from 1.9% in 2017 (IMF, 2018) as demand for IT goods as well as

Chinese exports continued to drop. Aggravated by the COVID-19 pandemic, Japan continued to contract recording annual real growth rate of -4.8% in 2020 (Government of Japan, 2021). A brief historical summary of Japan's economic growth is reflected in Figure 2.2 (Andressen, 2003).

Figure 2.2: Annual Real GDP Growth Rate, Japan, 1956-2020



Source: [www.ceicdata.com](http://www.ceicdata.com)

### Industrial Structure

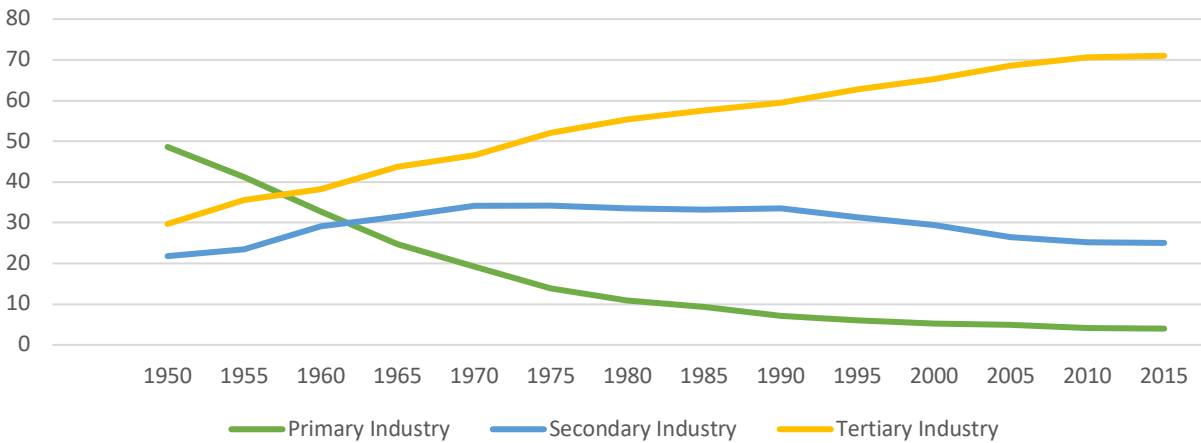
The story of the Japanese economy from the Meiji restoration through the 1940s has three episodes – a relatively high state control in the first 15 years, then a period of relative laissez faire from the 1880s through the 1920s and then a tightening of state control in the 1930s and into the 1940s, which is associated with militarization. The *Zaibatsu* that first emerged with the sales of the early model factories, like Mitsui and Mitsubishi, were some of the largely urban firms, though they remain dispersed throughout the country in various activities. What distinguishes the *Zaibatsu* from the big corporations in the era of monopoly in the United States, in the late 19th and early 20th century, is how dispersed they are. Vanderbilt or Carnegie are anchored on one industry, whether it's railroads or iron and steel. Mitsui had a hand in everything, and so did Mitsubishi, or Sumitomo, or Yasuda – the four main ones. They had mines, so those were not in cities. In cities they had cotton textile mills, paper mills, the textiles, banking, and insurance. This enabled Japanese urban centers to grow tremendously and become fertile grounds for new industries to take off (Addicott, 2017).

Japan underwent tremendous restructuring after the second world war. The pre-war system of '*keiretsu*' was revised under American control and several new companies, such as Honda and Sony (earlier Tokyo Communication Industries), equipped with cutting-edge technologies and changing business environment found the market niche to grow and explore. In the value chain, several smaller industries mushroomed which to-date continue to support much of the operations of global Japanese brands. The 'New long-range economic plan' of 1957 states Japan's ambition to compete with the advanced economies of the world. Since imperialism was no longer

a way, Japan invested in securing raw materials and produced goods that could be easily traded in the world market with least risk margin such as textiles, toys, cutlery, bicycles, among others. The profit from these were ploughed back into the system for research and development. Economic diversification of ‘sunset industries’ were encouraged through provision of low-cost loans, tax reforms, and protectionist policies. Close association with America helped businesses with facilitating technology transfers and production techniques, as well as funded several students to receive education in these new innovations. The 1960s saw consolidation of Japan Inc., a term that has been used to describe the close cooperation of government, bureaucracy, and corporations. The US, in exchange for using Japan as military base for its engagement in Vietnam, kept the value of yen at its 1949 level (¥360 to the US dollar), which made Japanese exports very cheap throughout the 1960s. As a result, Japan’s export to USA rose from \$10 billion to \$24 billion (Andressen, 2003). Japan became the third largest economy by the end of the decade and joined the privileged membership of OECD. During this time, heavy industry, iron and steel, shipbuilding, metal products and automobiles production increased considerably (OECD, 2014).

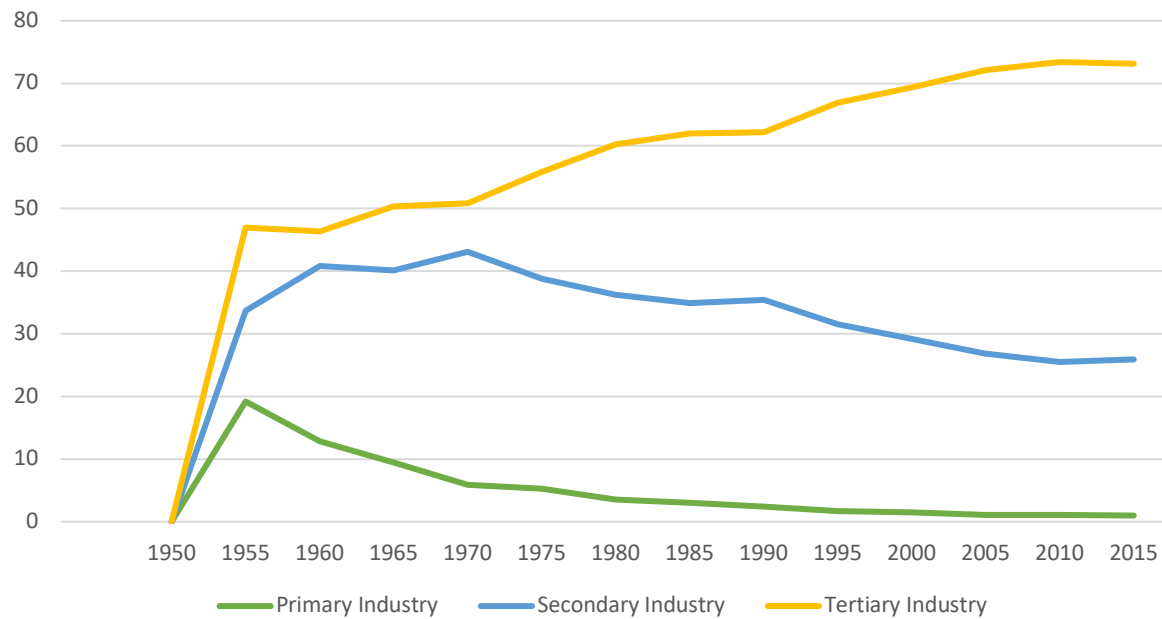
Since 1970 however, the primary sector’s industry share of employed persons and GDP continued to fall as Japan lurched towards the growth of secondary industries. This trend was soon continued until 1980s when Japan again moved remarkably fast from secondary to tertiary sector, as shown in Figure 2.3 and Figure 2.4. The industrial mix in 1970 accounted for 19.3% in primary sector, 34.1% in secondary sector and 46.6% in tertiary sector which by 2015 has changed into 4%, 25% and 71% respectively. Similarly, GDP by type of economic activity, in 1970, the primary, secondary and tertiary industries accounted for 5.9%, 43.1% and 50.9%, respectively. In 2015, these changed into 1.0%, 25.9% and 73.1%, respectively (Statistics Bureau, Japan, 2021).

*Figure 2.3: Changes in the industrial structure by industry share of employed persons*



Source: Economic and Social Research Institute, Government of Japan

Figure 2.4: Changes in the industrial structure by industry share of GDP



Source: Economic and Social Research Institute, Government of Japan

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## 2.2. Bangladesh

*Brane Gradina, Dillan Patel, Smriti*

### 2.2.1. Introduction

Bangladesh has long suffered from low economic development since its independence in 1971. In the most recent decades, however, its economic growth has shot up, resulting in great strides in health outcomes and poverty reduction. As a result, the country's life expectancy is increasing while its fertility rate is falling rapidly. This affords an opportunity for an increasing number of elderly people to enjoy a higher standard of living than their ancestors. The country still faces many threats, including climate change and worsening natural disasters, regional instability (such as Bangladesh's neighbor Myanmar), and greater international competition as the country globalizes.

Bangladesh has a population of 168 million people according to the latest available data (UNFPA, 2022). The modern history of Bangladesh is divided into several significant periods. The first period reflects a century of British colonial rule that started in the mid-eighteen century. The next much shorter period lasted between 1947 and 1971 when Bangladesh was part of Pakistan, and during that time, it was called East Pakistan. Finally, in 1971 Bangladesh won independence and became a sovereign state. Today Bangladesh is a modern state, although still considered a low-income country; with recent rapid development, the UN is projecting it will become a developing country by 2026 (UNDESA, n.d.), graduating from least-developed status. In addition, Bangladesh is one of the most populous countries globally and one with the highest population density, with an average of 1000 persons per square kilometer (UNFPA, n.d.). Most of the population, or 62%, lives in rural areas. However, according to the World Bank analysis, the rural population is steadily decreasing, likely because of mass migrations toward urban centers.

### 2.2.2. Demographic Trends

Bangladesh has the fifth largest population in Asia, accounting for less than 4% of the total Asian population. It is however, one of the densest countries in the world owing to its comparatively small size.

Bangladesh has experienced a rapid fall in its fertility rate – faster than its neighbors – to the point that fertility is now near replacement rates. Between 1960 and 2016, the fertility rate fell from 6.7 births per woman to 2.1. In just two generations, a woman would have four fewer children than their grandparents. On average, Bangladeshi women have fewer children than women in Pakistan or India. Only Sri Lanka has consistently had a lower fertility rate between 1960 and 2016. Fertility rates remained high between 1960 and 1980; much of this decrease happened during the 1990s even when the country experienced low per capita real income growth. As the graph shows below, there was a strong uptick in population growth in the years after independence, but that has steadily declined.

Figure 2.5: Population growth in Bangladesh, 1971-2020



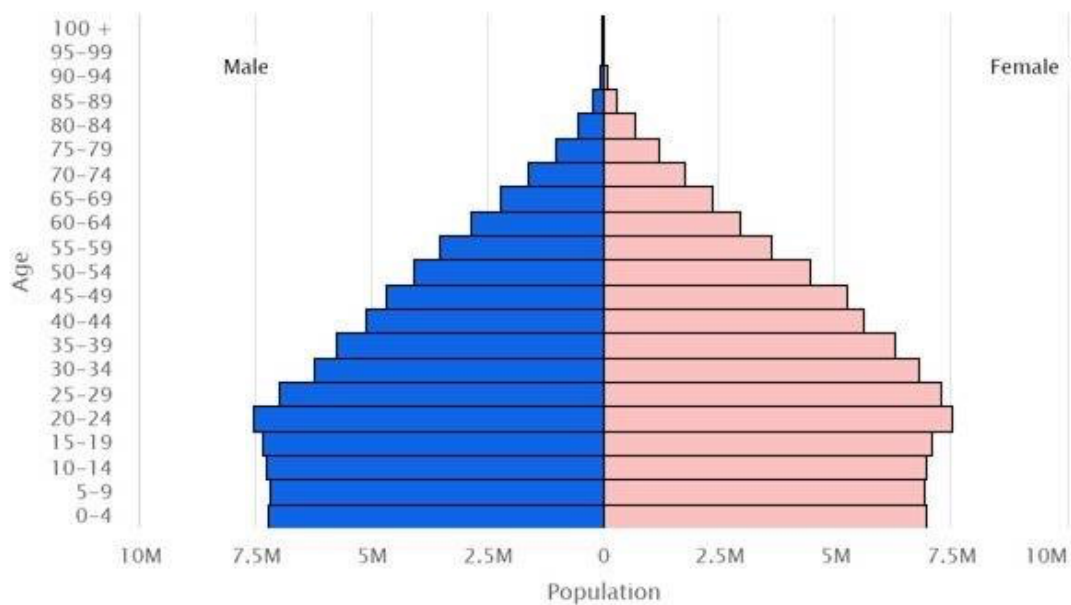
Source: World Bank Databank

The fall in fertility coincided with a fall in mortality rates and higher longevity. The life expectancy at independence was 46. By 2017, this rose to 73. As a result, the elderly population as a share of the total in Bangladesh is increasing. The elderly population has averaged between 5 and 6 percent of the total since independence but is expected to grow to 15% by 2040 (Rajan, 2007).

The combined fall in fertility and mortality is characterized as the third phase of the demographic transition. Earlier phases involved a high fertility and high morbidity equilibrium, then a sustained decline in both. Now, Bangladesh has a low fertility rate and relatively low mortality rate. This change offers a 'demographic dividend' because the large number of children that were born in previous decades are now of working age and are likely to survive into retirement. Therefore, Bangladesh has a large workforce.

Regarding the age distribution, the largest population cohorts are 10-24 years (28%) and 0-14 (26.3%), and cumulatively the most significant cohort is 15-64 (68%) (UNFPA). On the other hand, those older than 65 years make up just 5% of the total population. Therefore, Bangladesh's population is young. Bangladesh has dramatically increased life expectancy in the past half-century, from 53 years in 1980 to 73 years in 2019 (World Bank, 2022). A similar trend is also present in the other countries in the South Asian region. According to the latest data from the World Bank, the country has a significantly higher average infant mortality rate (25.5/1000) compared to the world average. Still, it is below the average compared to the region (Pakistan, Afghanistan, and India have considerably higher rates). Although the Bangladeshi population has increased significantly in the last couple of decades, the fertility rate is not the highest. The rate of 1.9 is well behind Afghanistan (4.3), Pakistan (3.5), India (2.2), and Sri Lanka (2.1).

Figure 2.6: Age Distribution of Bangladesh by sex



Source: U.S. Census Bureau, International Database

### 2.2.3. Economy

Bangladesh used to be one of the poorest countries in the world when it achieved independence in 1971 and suffered from low growth during its first post-independence years. In the past few decades, it has experienced impressive growth, especially when compared to its South Asian peers. It is expected to graduate out of Least Developed Country status to a Lower Middle Income Country by 2026. It has averaged 7% growth in GDP in the past eleven years. The economy has grown more than five-fold over twenty years, from \$157 billion to \$802 billion in 2020 in purchasing power parity terms (World Bank, 2022). Real per capita income is about \$1900 (High Commission for Bangladesh, Ottawa, Canada, n.d.). There are several contributors to economic growth such as household consumption, investment, and strong exports. Industry has grown faster than services and agriculture in the past few years. The textile industry has been the main powerhouse of the economy, although the country is rapidly transitioning to a service-based economy, including high-value services such as microfinance and ICT. The textile industry employs four million workers, the vast majority female. Garments account for the most export revenue, equaling \$34 billion in 2018-2019 (High Commission for Bangladesh, Ottawa, Canada, n.d.). Since 2017 however, it has had a current account deficit. Its imports include petroleum products and capital goods.

Inflation in Bangladesh has been between five and six percent since 2019 and is expected to continue at this rate for the next few years (ADB, 2022).

The country has benefitted from a youthful population – the median age in Bangladesh is 28 – enabling it to have a large labor force. Even so, unemployment is relatively low, at least according to official statistics. It averaged 4.4 percent between 2013 and 2019. Nonetheless, many Bangladeshis emigrate to developed economies where they can seek higher wages and send money back home as remittances. Remittances reached \$18 billion in 2020 (United States Department of State, 2021).

The country has managed to translate its economic growth into sustained poverty reduction. Poverty at the \$1.90 a day line has declined from 43.5 to 14.3 percent between 1991 to 2016. Remittance flows from the Bangladeshi diaspora have helped income growth. There is now an emerging middle class in the country.

Despite significant investments from multilateral development banks, private investors, and the country's investment fund, the quality of infrastructure in the country is low. Even with donor support, infrastructure investment is inadequate: it accounts for about 3.5% of GDP, 1.5 percentage points lower than what is needed to provide adequate services for its population, and two percentage points lower than what is needed to achieve the Sustainable Development Goals. If current trends continue, there will be a \$230 billion investment shortfall in infrastructure investment by 2040 (GIHub, 2021).

The Government maintains a low debt level at 38%, though it had sustained large deficits during the COVID-19 pandemic. Despite increases in healthcare spending in response to the pandemic, public health spending has been historically low compared to the country's neighbors. Bangladesh spent 2.5% of GDP on healthcare in 2019 (World Bank, 2022). Social care for the elderly currently accounts for a small but growing percentage of government spending and GDP. The country has one of the lowest tax-to-GDP ratios globally and is lower than the average for low-income countries (9% versus 12%) (Ahmed, 2020).

Threats to Bangladesh's economy include stricter immigration policies from developed countries, limiting the number of Bangladeshi immigrants, and reducing remittance inflows back to the country. Even in countries suffering from a declining workforce, there are considerable barriers to the movement of people.

Currently, foreign direct investment as a share of GDP is one of the lowest in the continent, at 0.5% (United States Department of State, 2021). However, an aging worldwide population presents a considerable opportunity to increase international investment in Bangladesh. If countries implement policies to increase individual savings for retirement and Bangladesh strengthens incentives for investment, pension funds will provide a significant source for infrastructure investment in the country.

#### 2.2.4. Healthcare Overview

The healthcare system in Bangladesh is highly decentralized. Most of the system is controlled by commercial hospitals, and the rest is divided by NGOs, international organizations, and the

government. There is a shortage of medical staff and equipment on a national level. There are only 3.0 physicians and 2.8 nurses on average for 10,000 people. Although the population is mostly rural, most healthcare facilities are concentrated in urban areas. However, one of the main reasons for unequal access to the healthcare system is high out-of-pocket costs. According to the study, average Bangladeshi citizens must pay more than 63% of total medical expenses. For most, particularly the rural poor, this represents a significant burden. In 2017, Bangladesh spent only 2.3% of its GDP on the healthcare system, far below the regional mean of 5.4% of GDP.

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## 2.3. Nigeria

*Shi Chen, Liliana Ordóñez, Lydia Zoe*

### 2.3.1. Introduction

Nigeria is Africa's largest economy and is recognized for being a culturally diverse federal country. It is on track to becoming the world's third most populated country. Additionally, it is estimated to gain 100 million new people under the age of 35 by 2040 (Adhikari, Clemens, Dempster, & Ekeator, 2021). Since 2011, the political and security landscape of the country has been determined by the war against Boko Haram. This terrorist group operates in the country's northeast region, but it is also active in Chad, Niger, and Cameroon. According to the World Bank Human Capital Index 2020 (HCI)<sup>3</sup>, the country continues to face several development challenges. For instance, a child born in Nigeria today will be 36% as productive when they grow up as compared to a child who has complete education and full health access (The World Bank, 2020). Compared to other Sub-Saharan countries in Africa and lower middle-income countries, Nigeria's HCI is low, with the country ranking 150 among a total of 157 countries.

Regarding its geographical characteristics, the country is located on the Gulf of Guinea and is the world's 32nd-largest country. It shares borders with Benin, Niger, Chad, and Cameroon and the main rivers are the Niger and the Benue, which converge into the Niger Delta. This region has accounted for an overwhelming majority of Nigeria's earnings since the 1970s because it is an oil-rich region and has turned the country into Africa's largest oil producer. However, this region continues to suffer the multiplier effect of decades of environmental degradation, which has eroded livelihoods and deprived residents of essentials such as access to clean drinking water (Egbejule, 2021).

### 2.3.2. Demographic Trends

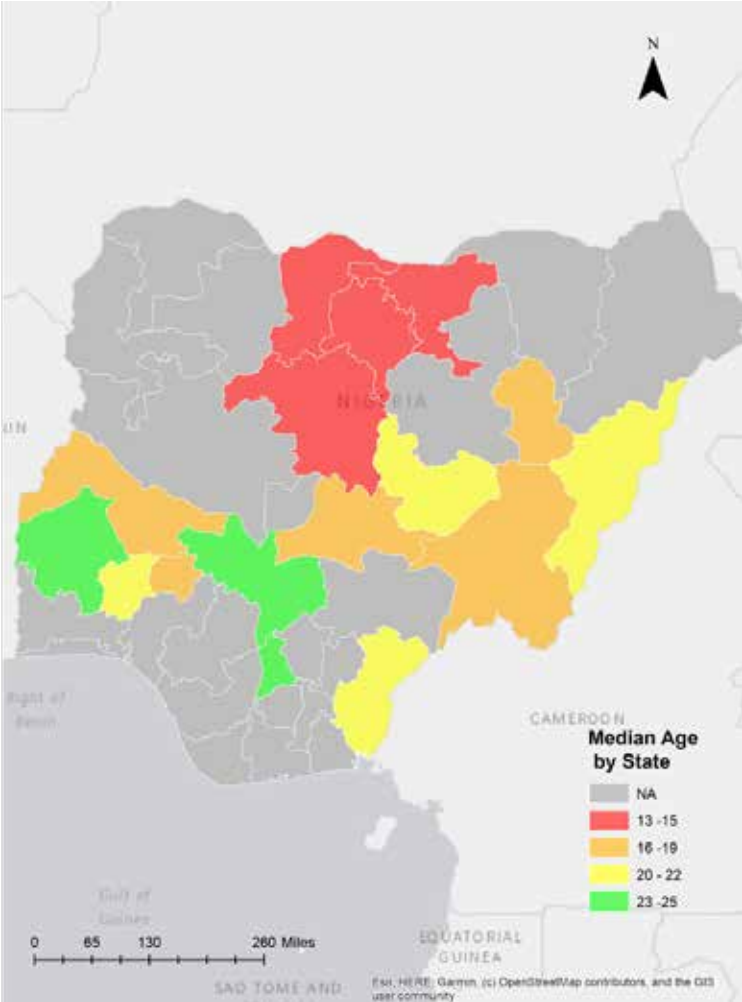
With an estimated 2021 population of 420 million, West Africa is home to 5.3% of the world's population. The population has multiplied up to five times since 1950 (73 million), making West Africa as the fastest growing in any of the world's regions (UN, 2020). Nigeria alone accounts for approximately half of West Africa's people. In 1960, the country's population was 45.14 million, since then – the population has multiplied by 4.6 times growing to 206.1 million by 2021. In comparison, the world population has increased 2.6 times in the same 60 years period. With this explosive growth in population – this has contributed to an increasingly younger population structure. Almost 44% of Nigerians are 15 years old and younger, assuring continued population growth into the short and mid-term future. Based on the analysis of Nigeria's Living Standards Survey 2018-2019, the median age in the country is 18 years old. Even considering the rural and

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<sup>3</sup> A measure that quantifies the contribution of health and education to the productivity of the next generation of workers

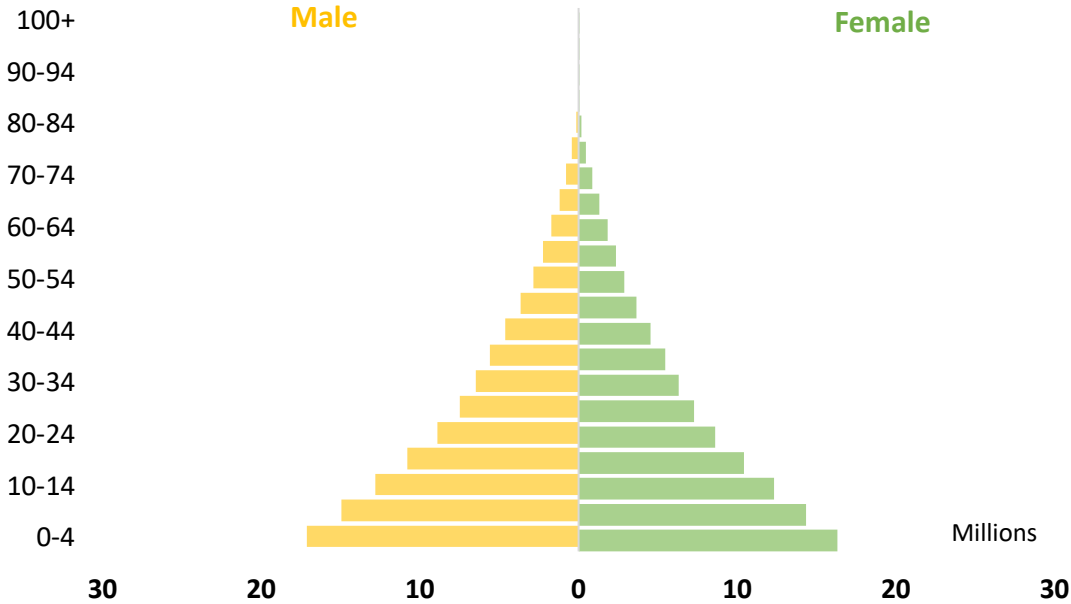
urban areas within the country – the median ages are not far apart – with the median age in rural areas of 18 years and 20 years in urban areas. By disaggregating the same measure by region, we can observe that the younger population is in the country's north region, conversely with the higher levels of poverty.

Map 2.2: Median Age by State in Nigeria



Source: Authors' calculations based on Nigeria Bureau of Statistics

Figure 2.7: Nigeria's Demographic Pyramid



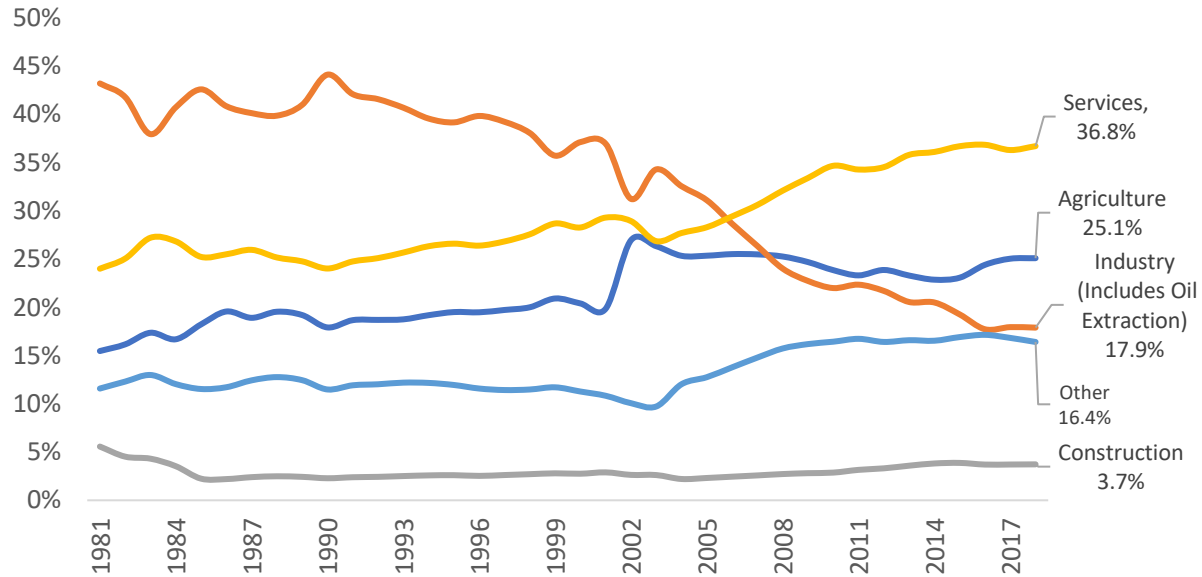
Source: Authors' calculations based on Nigeria Bureau of Statistics

### 2.3.3. Economic History

After 1960, when Nigeria achieved independence from the United Kingdom, agriculture was the pillar of the Nigerian economy generating the bulk of government revenue and foreign exchange earnings. Nonetheless, after the discovery of oil in the Niger Delta and its exploration and exportation, agriculture income gradually diminished while crude petroleum replaced it as the dominant source of revenue and export earnings (see Figure 2.8). The structure of GDP in Nigeria during the last years shows the dominance agriculture, and services.



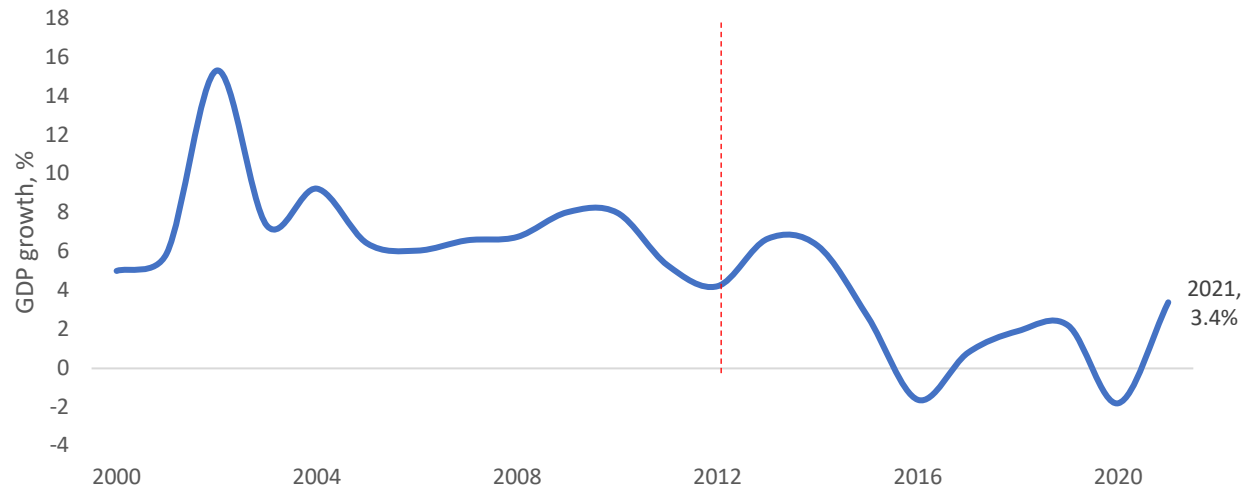
Figure 2.8: Composition of Nigeria's GDP



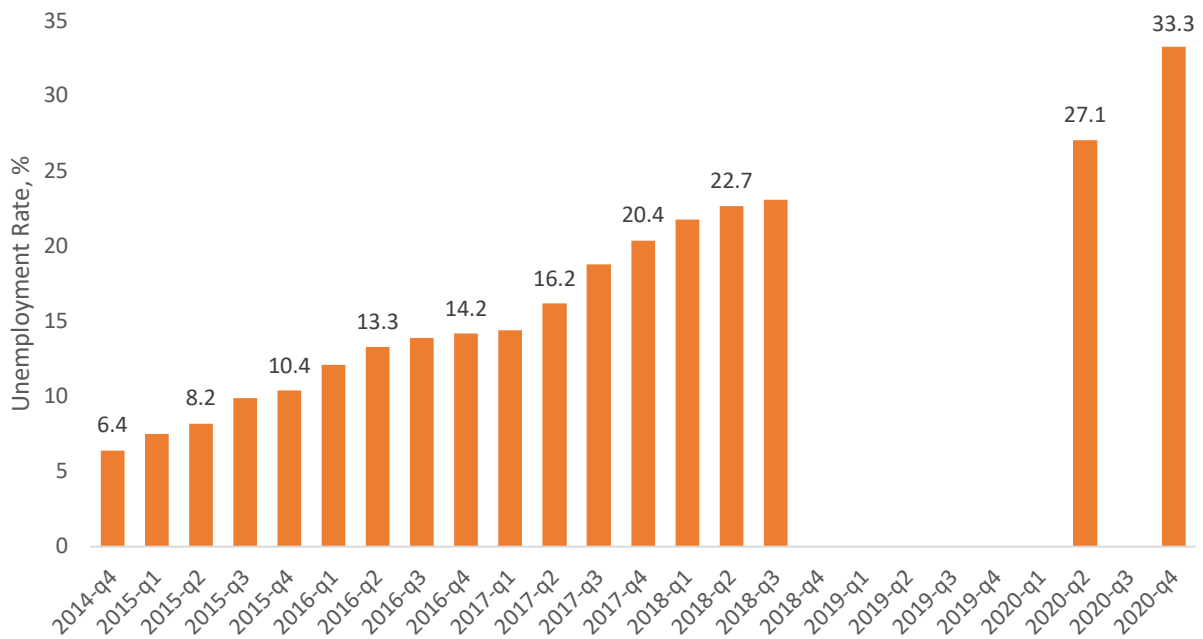
Source: Nigeria Bureau of Statistics

Currently, because of the COVID-19 pandemic in 2020, Nigeria has experienced its deepest recession in two decades (see Figure 2.9). However, by 2021, growth resumed due to easing of pandemic restrictions and the recovery of oil prices. Nigeria's economy is highly dependent on the behavior of oil prices, which accounts for over 80% of exports, a third of the banking sector credit, and half of all government revenues (World Bank, 2021). Since 2014, the country experienced a slowed growth, losing 3.4 percentage points between 2014 and 2015, before contracting by 1.6% in 2016 following the shocks in international oil prices. Although the GDP exhibited growth in 2021 in comparison to 2020, the effects of COVID-19 continue to impact Nigeria's labor market. According to a report published by National Bureau of Statistics, less than half of Nigeria's labor force is fully employed, with unemployment rates rising to 35% in 2021 (Chete, Adeoti, Adeyinka, & Ogundele, 2016); see Figure 2.10. Adhikari et al (2021) estimated that between 2010 and 2018, 25 million Nigerians entered the labor force; and although the unemployment rate (35%) affects all Nigerians it has the largest impact on younger Nigerians who have completed secondary and post-secondary education. The authors estimated that the country needs to create additional 30 million jobs by 2030 to employ their growing working population.

Figure 2.9: Nigeria GDP Growth 2000-2021



Source: Nigeria Bureau of Statistics



Source: Nigeria Bureau of Statistics

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## 2.4. Climate Change

*Brane Gradina*

### 2.4.1. Climate Change Risk

Population aging is one of the most pressing issues on a global level. However, the process is not happening in isolation but in parallel with other globally significant changes. One of them is climate change which is the subject of this chapter. We understand climate change as an issue multiplier. Although it is unlikely that aging and climate change are related, we argue that climate change can raise additional vulnerability in specific sectors due to ongoing changes in population. Therefore, we examined the climate change issue through socio-economic lenses, focusing on health. All of the three countries we looked at have a relatively high natural hazard exposure index and have started the process of adaptation. However, they are in very different stages in that process. Japan is leading in capacity development, and at the same time, it is the country that is the most exposed to climate incidents. On the other hand, Bangladesh and Nigeria have made significant progress in this field but still need to develop a robust and resilient system. Regarding the healthcare system adaptation, a major issue is a lack of funding and efficient coordination. Developing countries massively depend on international aid to make their healthcare systems climate-resilient. Finally, we examined the most common aspect of climate change - heat. The issue of heat is recognized in all three countries as one of the major climate change impacts on health. We studied heat through lenses of age, gender, poverty, and productivity to highlight the complexity of climate change in the healthcare sector from a policymaking perspective.

#### *Japan*

Although Japan shares the same continent as Bangladesh, its exposure and vulnerability slightly differ due to regional climate variations. According to the IPCC report, as a part of the East Asia region, Japan is particularly exposed to coastal flooding, heatwaves, and sea level rise. The expected impact of such hazards, as in Bangladesh case, is likely to affect between 25% and 50% of its population and businesses.

The projected increase of temperature for the next century in Japan is between 2 and 3 degrees Celsius (Case & Tidwell, 2017). Consequentially, it will increase the number of extremely hot days (for Japan, temperature above 35 degrees Celsius). Regarding the precipitation, it is expected to increase by more than 10% of the mean precipitation over this century. In addition, the summer precipitation is expected to increase by 17 to 19%. Weather conditions are also expected to reflect on the energy consumption. According to the IPCC report, “more energy demands in summer seasons will exceed any energy savings from relatively lower heating demand due to warmer winter” (p.10-3). In the context of Japan, this will expose a vulnerability in the energy sector as the country still heavily depends on fossil fuels as a primary energy source. Around 88% of the total energy supply in Japan is obtained from fossil fuels, mainly imported oil and coal (EIA,

2022). The scientists see energy shortage as a major challenge in achieving sustainable goals across Asia.

Sea level rise is another issue Japan will continue to experience as an island country. Throughout the 21st century, 46% of its population and 47% of its industry are projected to be threatened by sea level rise caused by anthropogenic climate change. The same study projected that increase of 1 m of sea level rise would cause loss of 90% of sandy beaches in Japan and put assets worth about \$1 trillion in danger. Regarding food production, climate change will impact crop production in Japan. The studies in the IPCC reports underline the importance of adapting crop production to avoid quality issues and loss of yield. Coastal cities in East Asia are expected to experience economic losses more significant than anywhere else in Asia due to flooding between 2005 and 2050 under high emission scenarios.

Scientists are confident that “climate change is increasing vector-borne and water-borne diseases, undernutrition, mental disorders and allergic diseases in Asia by increasing the hazards such as heatwaves, flooding and drought, air pollutants, in combination with more exposure and vulnerability” (p.12). However, diversity among countries regarding socio-economic, demographic context, and geographical characteristics are all the factors that influence the level of vulnerability for each country regarding health. Lastly, the impact of climate change on migration in East Asia has mainly been reflected through internal displacement. The main causes are cyclones, floods, and typhoons. In 2019, 9.6 million people in East Asia were displaced, 30% of total global displacements due to these events. (IPCC, 2022). However, this information should be observed with caution regarding the Japan case since the East Asia region includes the most populated country, China. Also, these projections do not include other reasons for displacement, such as environmental, which is very much applicable to Japan.

### *Bangladesh*

Asia is the most disaster-prone region in the world. Some estimates suggest that over 200,000 lives were lost in storms and floods between 2005 and 2014, and more than a billion people are affected by extreme weather (UNDRR, 2019). However, the risks are not equally spread throughout the continent. According to the recent IPCC report, the major causes of loss and damages for South Asia, including Bangladesh, are coastal flooding, drought, sea level rise, and heatwaves. Those causes are projected to impact between 25% and 50% of the total population and sectors under most of the scenarios.

The air temperature observations have shown an increase in the 20th century, causing the increased threat to social and economic sustainability in South Asia. Rising temperature will increase the likelihood of the heatwaves, delayed and weakened monsoon circulation, and floods. The consequence of the hotter summer climate will reflect in noticeably increased energy demand, further impacted by the population growth. The scientists state two major reasons behind increased demand, cooling and water supply.

Most of the population in South Asia depends on the coastal habitats. With the increasing temperature, ocean acidification and sea level rise, livelihoods and services are negatively affected. In addition, climatic and non-climatic drivers such as socio-economic changes have created water stress conditions in supply and demand. In Bangladesh, this is particularly visible in the coastal regions that have developed aquaculture production in an unsustainable way. Such changes are reflected in increased soil salination and freshwater scarcity. However, the IPCC report projects that aquaculture and food production in South Asia will be noticeably impacted. The decline is projected for fisheries, aquaculture, and crop production sectors.

Coastal cities in South Asia are expected to experience a significant increase in average annual economic losses between 2005 and 2050 due to flooding. The scientists project that by 2080, between 940 and 1100 million people who live in urban areas in South and East Asia could be affected by extreme heat lasting more than 30 days/year and that poorer population will be the most affected. Climate change will also affect public health. In South Asia, it is expected that an increase in climate-related hazards will also increase vector-borne and water-borne diseases, undernutrition, mental health issues, and allergic diseases. Finally, extreme weather events will increase migration flows across Asia. In Bangladesh, some studies agree with the robust conclusion of migration dynamics; however, they project that migration will be primarily local within the same region (Bell, et al., 2021). Despite the threat in the coastal regions, it is expected that more people will move there due to economic reasons.

### *Nigeria*

Although Africa contributes to GHG emissions the least, the consequences of climate change are very noticeable in the continent. The major issues in Africa related to climate change are biodiversity loss, water shortages, reduced food production, and reduced economic growth. One of the reasons is the increased mean and extreme temperature trends. This is particularly visible in West Africa, the region that includes Nigeria. The frequency of multi-year droughts is increased. On the other hand, in the flooding-prone regions of West Africa, the heavy rainfall events will increase, making those areas more likely to experience pluvial and riverine flooding.

Similarly, the IPCC report states that global warming will cause heat waves to become more severe and longer. Thus, "Under a 1.5°C-compatible scenario, children born in Africa in 2020 are likely to be exposed to 4–8 times more heat waves compared to people born in 1960, increasing to 5–10 times for 2.4°C global warming" (p. 6). The annual number of days with a temperature harmful to human health are expected to reach 50-150 in West Africa in the 1.6 Celsius scenario. Compared to other African regions, it is the lowest. Scientists predict that most African countries will experience changes in climate with high temperatures before any other wealthier and higher latitude country. Regarding the precipitation, the frequency and intensity of extremely heavy precipitation, according to the IPCC report, is projected to increase under at least two scenarios.

Global warming will most likely have a noticeable impact in that field regarding food production. The risk of food security will be further accelerated by low adaptive capacity since "85% of Africa's poor live in rural areas and mostly depend on agriculture for their livelihoods" (p.84). The impact

of climate change is already visible on crop production and slower productivity growth, which can cause further food shortage in the future. Similarly, it is projected that water availability will pose substantial concern for livestock during drought and increase livestock mortality.

On the other hand, human settlements and infrastructure in West Africa will face increased frequency and magnitude of riverine flooding. The hundred-year riverine floods are projected to increase to 1 in 40 years at 1.5 and 2C scenario, and 1 in 21 years at 4C scenario, making Nigeria one of the 20 most affected countries regarding the projected damages. Since Nigeria is a coastal country, the sea level rise will also pose a significant risk. In 2000, 7.4 million people lived in low-elevation coastal zones; in 2030, that number is projected to increase to 19.8 million and by 2060 to 57.7 million. According to the IPCC report, in the absence of any adaptation Nigeria (along with Egypt and Mozambique), is projected to be the worst affected by sea level rise if observed by number of people at risk of flooding annually at the 4C scenario.

Regarding health, it is projected that risk for all temperature-related issues will rise. Therefore, "Without management and mitigation, current and projected morbidities and mortalities will put additional strain on health, social and economic systems" (p.113). Interestingly, under the 8.5 scenario, Nigeria will have zero malaria transmission due to decreasing environmental suitability for the malaria vector and parasite. On the other hand, increased urbanization, together with the effects of climate change, will cause an increase in vector-borne diseases. Similarly, the report projects between 20,000 and 30,000 additional children deaths caused by diarrhea as a direct consequence of climate change in West Africa. In addition, rising temperature in Nigeria will cause an increase of meningitis cases by about 50% for the 1.8C scenario and by almost double for the most extreme global warming scenario.

Scientists widely studied the climate change impacts on economic development. The reduced rainfall and increased average temperature have reduced the economic output of African countries. Some studies project that "a 1°C increase in 20-year average temperature reduced GDP growth by 0.67 percentage points" (p.130). In the observed period 2000-2010, all African countries had significant GDP decline caused by climate change (except Lesotho). Nigeria is one of the countries with the highest GDP decline related to climate with a change of almost 20%. Interestingly, the IPCC report has not found a relationship between climate change and migration for Nigeria.

#### 2.4.2. Climate Change Adaptation

##### *Japan*

Adaptation efforts in Japan were traditionally closely related to climate change science developments. The comprehensive planning can be traced back to 2006 and the publication of the IPCC scientific findings. Although that wasn't the first environmental plan, it was the first to consider climate change more systemic. After that, the government of Japan started investing in the research and development of climate change science. At the same time, the government was developing sectorial policies based on the newest technical findings. The fourth Environment

Basic Plan was the next comprehensive plan after the one from 2006. The plan “prescribes various actions, including the following: ascertain impacts, and collect and share scientific findings of the impacts; promote adaptation to prevent and mitigate the most immediate short-term impacts; and promote consideration of ways to enhance the capacity to adapt, in order to contribute to the prevention and mitigation of impacts that may occur in the medium- and long-term” (NAP, 2015) p. 5 ). The latest plan influenced the formation of the Expert Committee on Climate Change Impact Assessment in 2013. The government established the body with a taskforce to inform the government about the latest development in climate change science. In 2015 the Committee prepared and proposed the most comprehensive and detailed climate change adaptation plan, which was eventually approved and is active today. The new plan was formed by the end of 2021, but it is still to be approved. The plan singles out seven critical sectors that are threatened by climate change: Agriculture, Forest / Forestry, Fisheries; Water Environment, Water Resources; Natural Disasters, Coastal Zones; Natural Ecosystems; Human Health; and Life of Citizenry, Urban Life. In addition, each sector plan underlines the categories that require additional policy attention. These are paddy field rice; fruit trees; plant pest and weeds; shifts in distribution and populations; floods; storm surges and high waves; risk of mortality, heat illness; and impacts on life due to heat stress. The adaptation cost is an integral part of the yearly government budget.

### *Bangladesh*

The start of the official climate change adaptation process in Bangladesh can be traced back to 2005 and the submission of the National Adaptation Program of Actions (NAPA). Besides a couple of updates, this document led to the approval of the first national adaptation plan in 2009. The process continued till 2017, with several critical points in 2015. In May 2019, the Bangladeshi government adopted the updated version of BCCSAP that included the recommendation related to the SDGs. However, the process of developing and governing the national adaptation strategy is not centralized, and it has been assigned to the Ministry of Environment and Forests, Ministry of planning, and Ministry of Finance. The priority sectors emphasized in the plan are:

- (1) Water Resources,
- (2) Agriculture (including sub-sectors such as crops, forestry, fisheries, and livestock),
- (3) Communication and Transportation,
- (4) Physical Infrastructure (including education infrastructure),
- (5) Food and Health Security,
- (6) Disaster Risk Reduction,
- (7) People’s Livelihoods,
- (8) Urban Habitation and Built Environment (including water supply, sanitation and hygiene),  
and
- (9) Education (UNDP, 2022).

Since Bangladesh is a coastal country with a substantial portion of the vulnerable population living in the flooding areas, under direct impact of sea-level rise, the government also



implemented a Delta plan 2100. The government's aim with the plan is to "eliminate extreme poverty, create more jobs and sustain GDP growth above 8% until 2041... [also] to increase trade and navigational opportunities and strengthen food security" (Roome, 2021). The plan also covers issues such as rural-urban migration and inter-regional migrations. Government of Norway have supported the development and implementation of the national adaptation plan, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the joint UNDP and UN Environment NAP Global Support Programme. The estimated cost of the key goals from the plan is estimated to be \$40 billion between 2015 and 2030 (MEFCC, 2018). The Bangladeshi government is highly dependent on international financial aid to finance the adaptation.

### *Nigeria*

Nigeria's comprehensive climate change adaptation strategy started in 2003 with the First National Communication. During the period that followed, several supplementary policies and programs were approved. The most important one is the National Adaptation Strategy and Plan of Action for Climate Change in Nigeria from 2011. The plan was updated with the National Adaptation Policy framework in 2015 and 2020. However, the adaptation planning and coordination are assigned to the lower level of government departments. The critical sectors in national policies are energy, agriculture, water resources, forestry and wildlife, education, health, security, and transportation. In the agriculture sector, goals are related to adopting advanced agricultural systems for crops and livestock. Also, the goals are to improve soil management and develop early warning system. For the water resources, the main goal is to develop centralized water resource management. The goal of the forestry sector is to implement national forest policies. On the other hand, for the health sector, the aim is to undertake further research to better assess the impact of climate change on health. Additionally, the focus is on prevention and treatment improvements. The energy sector in Nigeria is traditionally vulnerable to the impacts of climate change. The adaptation strategies in this field are focused on strengthening the current energy infrastructure and diversification of secure energy backup systems. For transportation, the adaptation framework envisions the development of more climate-resilient infrastructure and transport diversification. The estimated cost of adaptation only for these priority sectors is estimated to reach from \$ 11.45 billion in 2020 to \$20.6 billion in 2050 a year (DCC, 2021). The adaptation cost cannot be covered solely by the national budget. Therefore, the Nigerian government needs substantial support from international organizations and funds to successfully implement the national adaptation policies.

### 2.4.3. Climate change risk index

There are several risk assessment methods commonly used in the climate change literature. Based on the examined literature, we have decided to use World Risk Index (WorldRiskReport, 2021), due to the highest agreement of efficiency of this approach. The basic idea behind developing the risk index that is based on comprehensive understanding of the climate change and impact of extreme natural events for each country. In other words, "disaster risks are not solely determined by the occurrence, intensity, or duration of extreme natural events... social

factors, political conditions, and economic structures play an equally important role in the genesis of disasters” (p.41). There are six components of risk index evaluation. Those are:

1. **Risk** is understood as the interaction of hazard and vulnerability, it results from the interaction of exposure to extreme natural events and the vulnerability of societies.
2. **Hazard/Exposure** means that people are exposed to the effects of one or more natural hazards – earthquakes, cyclones, floods, droughts, or sea-level rise.
3. **Vulnerability** comprises susceptibility, lack of coping capacities, and lack of adaptation capacities. It refers to social, physical, economic, and environmental factors that make people or systems vulnerable to the effects of natural hazards, the negative impacts of climate change, or other process- es of change. Vulnerability also considers the capacities of people or systems to cope with and adapt to adverse impacts of natural hazards.
4. **Susceptibility** is understood as the disposition to suffer damage in the event of extreme natural events. Susceptibility relates to structural characteristics and frameworks of societies.
5. **Coping** includes various capabilities of societies to minimize negative impacts of natural hazards and climate change through direct actions and available resources. Coping capacities include measures and capabilities that are immediately available during an incident to mitigate damage. For the calculation of the World Risk Index, the opposite value, the lack of coping capacities, is used.
6. **Adaption** is, in contrast to coping, under- stood as a long-term process that also includes structural changes (Lavell et al. 2012; Birkmann et al. 2010) and comprises measures and strategies that address and try to deal with future negative impacts of natural hazards and climate change. Analogous to coping capacities, the lack of adaptive capacities is included in the World Risk Index.

Figure 2.11: Climate Change Risk Index for Case Study Countries



Classification	WorldRiskIndex	Exposure	Vulnerability	Susceptibility	Lack of coping capacities	Lack of adaptive capacities
very low	0.30 - 3.25	0.85 - 9.57	22.68 - 34.21	9.03 - 16.68	38.35 - 58.92	14.22 - 24.78
low	3.26 - 5.54	9.58 - 12.04	34.22 - 42.02	16.69 - 21.56	58.93 - 71.19	24.79 - 34.10
medium	5.55 - 7.66	12.05 - 14.83	42.03 - 48.32	21.57 - 28.16	71.20 - 77.87	34.11 - 40.66
high	7.67 - 10.71	14.84 - 19.75	48.33 - 61.04	28.17 - 44.85	77.88 - 85.50	40.67 - 52.59
very high	10.72 - 47.73	19.76 - 82.55	61.05 - 75.83	44.86 - 70.52	85.51 - 93.17	52.60 - 70.13

Max. value = 100, classification according to the quintile method

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## 3. Economic Production: Sustaining Economic Growth

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*Richa Rashmi*

### 3.1. Introduction

Improving economic productivity can be an important stimulus to economic growth. Understanding the production function in Japan, Nigeria, and Bangladesh will provide insight into how aging working populations and economies that have a demographic dividend, but low levels of productivity can augment economic growth. Disentangling economic growth requires an analysis of three production factors – accumulation, productivity, and technology. Accumulation refers to the role and effect of investment on physical, human, and natural resources. On the demand-side, interaction between savings and investment leads to accumulation of capital and technology. (Kaldor, 1957). As per neo-classical economists, on the supply-side, capital accumulation keeps the economy steady until exogenous forces like technology and organizational change improve its growth rate.

Productivity is a measure of economic performance that indicates how efficiently inputs are converted into outputs (US Bureau of Labor Statistics, 2022). Output is equivalent to the total goods and services produced by an economy for a given period (mostly, per annum) and is measured in terms of real or inflation-adjusted local currency.<sup>4</sup> Thus, labor productivity measures the value of output generated by a single worker and is often used to assess cross-country comparisons. Historically, productivity growth has led to higher wages for workers and higher profits for businesses and thus, had major implications on economic growth, job creations, and living standards.

Labor productivity alone is not a good measure to gauge an economy's productivity and hence, economists use a production function to approximate productivity patterns. Baily et.al., defines a production function as “the level of productive inputs and the technology employed to combine inputs to produce output” (Baily, Bosworth, & Doshi, 2020). Solow identified output as a function of labor and capital, weighted at their respective factor shares in value added, and a “residual” in the difference between output growth and input contribution. This residual is known as ‘total factor productivity (TFP) growth’ and is often equated to technological progress, either from innovative processes or products (Saïdi, 2019). Thus, TFP measures the efficiency with which inputs are transformed into outputs. On the input side, growth is accounted to first, quality of labor measured in terms of education levels and age-sex composition, and second, capital distinguished by age structure called ‘the vintage effect’ (Gittleman, Raa, & Wolff, 2003). Labor productivity growth can thus be equated to “the sum of TFP growth plus the contribution of

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<sup>4</sup> Output is created by employees and the number of employees indicates the median level of employment over the selected time. Part-time employees are counted as a fraction of full-time employees. Output per hour or average hours worked per worker reflects productivity.

capital deepening (the increase in capital per hour worked weighted by the share of capital in cost)” (Baily, Bosworth, & Doshi, 2020). In addition, the ‘proximate’ sources of growth can also result from ‘foreign trade, structural effects, and economies of scale’ (Ark, 1999). Newer growth models have strengthened the argument on productivity by adding the spillovers from returns on R&D and innovations (Aghion & Howitt, 1992). Taking the identified factors into account, this section investigates current trends in labor markets, productivity, and the underlying reasons for such productivity pattern in three diverse economies of Japan, Nigeria, and Bangladesh.

## 3.2. Economic Production Profile

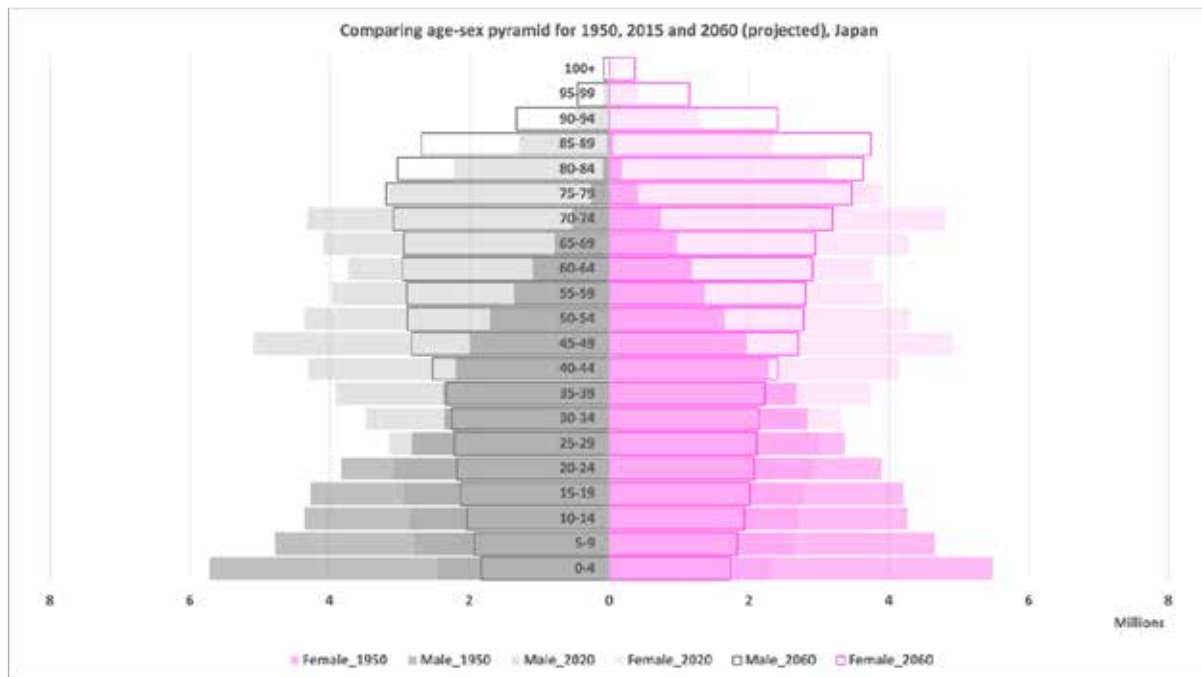
### 3.2.1. Japan

In Japan, one in every four persons in 2020 was in the age bracket of 65 years and over, constituting 28.8% (or, 36.19 million) of the total population, up from 26.6% in 2015 (Government of Japan, 2021). Japan continues to be the third largest economy of the world (World Economic Forum, 2018) despite aging structurally. With a shrinking population compounded by increased dependency, Japan’s economic growth now is a gigantic function of expansions in productivity (OECD, 2020). Japan exhibited the standard-shaped population pyramid in 1950 which by 2020, has become constrictive due to increased aging as well as decline in birth rates and death rates, as shown in Figure 3.1. The aging in Japan is unprecedented when compared with other world economies of 2015 such as the U.S.A. (14.6%), France (18.9%), Sweden (19.6%), Germany (21.2 %), and Italy (21.9%). The working age population in Japan (15-64 years old) constituted 59.3% of the total population in 2020, which has been predicted to further constrict to 51.6% by 2060. The child dependency ratio is 12%; combined with aged dependency of 28.8%, the ratio of the dependent population<sup>5</sup> was 68.8% (Government of Japan, 2021). This burdens the current workforce to provide for high dependency of older population by substituting loss in labor force with greater productivity per worker. Further, this also requires big investments in re-skilling and upskilling of labor force compounded with higher spending on advancement in technology and automation. On the social policy side, an aging dependency calls for increased investment in healthcare and social security. Also, as seen in Figure 3.1, there is an increased feminization of aging in Japan.

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<sup>5</sup> the sum of aged and child population divided by the productive-age population

Figure 3.1: Changes in the working age population of Japan

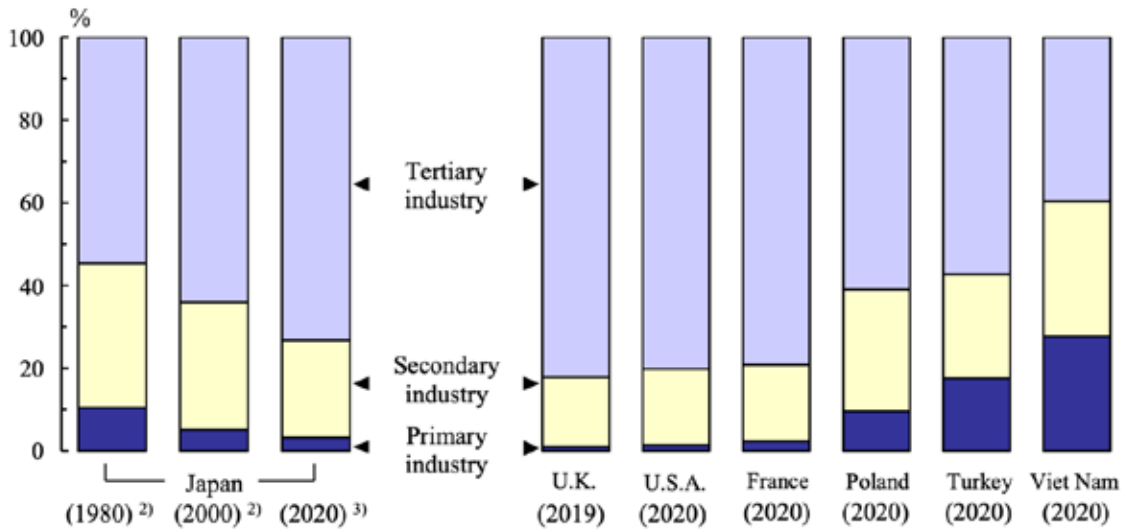


Data Source: Statistics Bureau, Government of Japan

In Japan, a 110.80 million people lived aged 15 years old and over in 2020, down from 111.17 million in 2011. Japan's 'labor force'<sup>6</sup> saw a marginal increase between 2013-2019 before falling again in 2020 to 68.68 million from 68.86 in 2019 (fall by 0.3%), which may be attributed to COVID-19 aftereffects. In 2020, Japan's employment level was 3.2% in agricultural sector, 23.5% in manufacturing sector and 73.3% in the service sector as shown in Figure 3.2. Due to this industrial shift, primary and secondary sector have experienced a decline in the overall employment level whereas the tertiary sector has peaked to employ more people. Of this, the 'medical, healthcare and welfare' has been absorbing a greater number of workers, especially the female labor force (Government of Japan, 2021), a direct repercussion of aging population and improvements on welfare services. Increased tertiarization in Japan follows similar trends as the developed nations of UK, USA, and France.

<sup>6</sup> Labor Force is the total of employed persons and unemployed persons among the population aged 15 years old and over.

Figure 3.2: Structure of employment in Japan and related economies



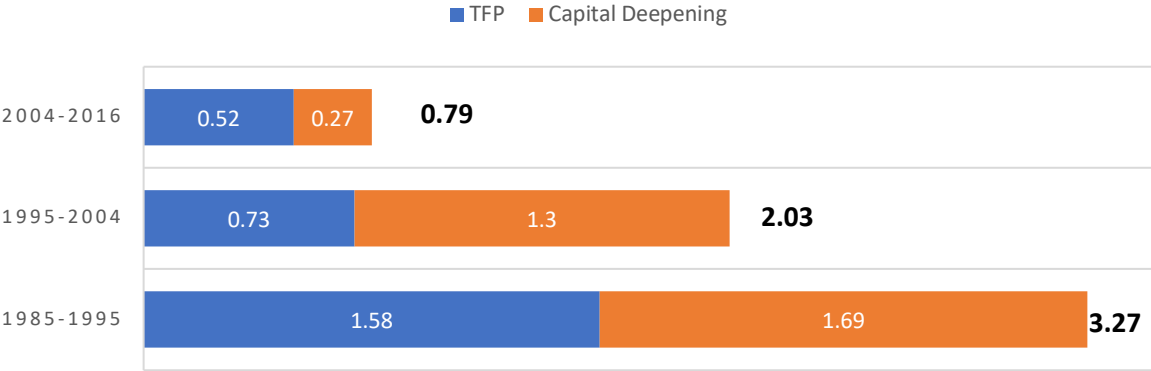
Source: Statistics Bureau 2021, Government of Japan

Japan experienced a very high TFP growth between 1985-1995 which slowed down extremely in the 2004-16 period, as shown in Figure 3.3. The post-World War II boom in the Japanese economy pushed it to achieve a miraculous growth which eventually slowed down in the 1990s. Thereafter, its economic growth has been challenged by structural issues of an aging demography, slowdown in TFP growth and lack of effective demand and deflation. Economic growth slowed down from 3.94% in 1983-91 to 1.25% in 1991-98, a 2.69%-point decline attributed to a slowdown in the working age population, TFP growth, and a slowdown in improvement of labor quality (Fukao, Inui, Kawai, & Miyagawa, 2004).

In the most recent estimates before COVID-19, Japan's "aggregate labor productivity was more than a quarter below the top half of the OECD countries in 2017 and growing at a slower pace" (OECD, 2020). The reason for this decline has been attributed to a shift towards low-productivity services industries as well as increasing productivity disparities between, within and across industries. This in turn has also led to widening inequalities in wage earnings. Between 2000-2014, inter-sectoral trend reveals that average labor productivity declined by 9% in 'large service industries'<sup>7</sup> and grew by 16% in manufacturing sector (OECD, 2020). This trend is explained by the slow rate of diffusion of technology, especially digital, which is even more challenged for older workforce as well as consumers. Also, the trickle-down of technology advancement has not reached the small and medium enterprises, being highly concentrated at large firm levels only (OECD, 2020).

<sup>7</sup> Firms with more than 50 employees

Figure 3.3: Japanese productivity growth



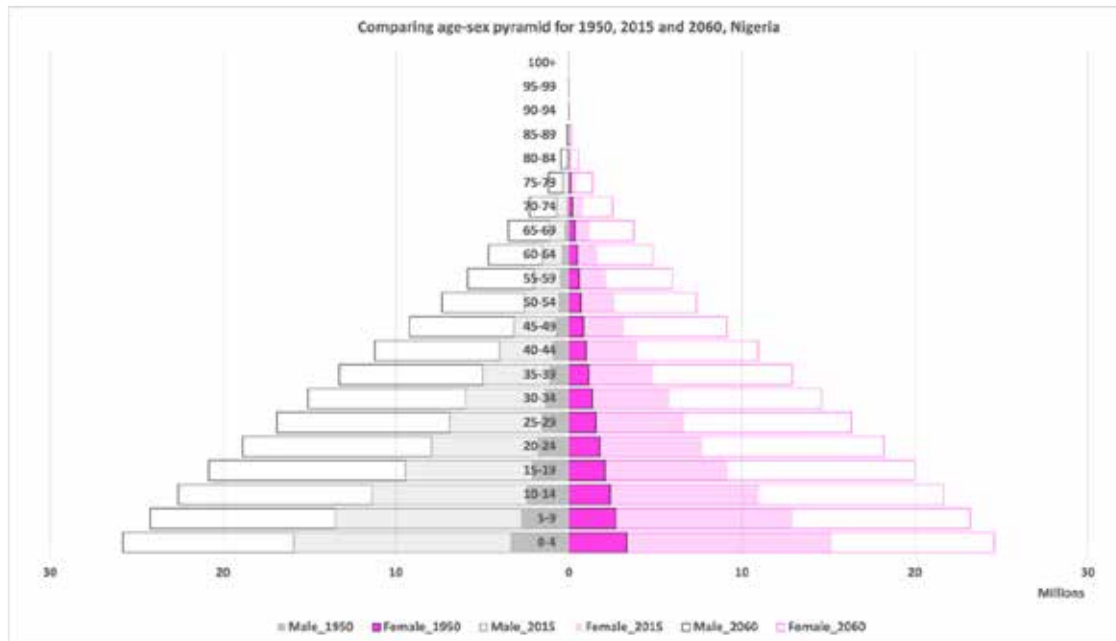
Source: Productivity comparisons- Lessons from Japan, the United States, and Germany (Baily, Bosworth, & Doshi, 2020)

### 3.2.2. Nigeria

Nigeria is Africa’s giant in both population and economy, owing to its 206.1 million strong population and a vast natural reserve of oil and gas (United Nations, 2019). It is a capital scarce but labour-abundant developing nation, dominated by a youthful population. The 1950 population pyramid continues to expand in 2020 as well, becoming stationary only by 2060, as shown in Figure 3.4. Unlike Japan that shows aged dependency ratio, Nigeria exhibits a high degree of child dependency ratio. The total age dependency in Nigeria is 88.2% as of 2015, of which child dependency is 83.1% (United Nations, 2019). The working age population in Nigeria as of 2015 is 53.13% of the total population of 181.1 million (The World Bank, 2019). It is dynamically increasing at a faster rate compared to other similar economies. The labour force went from 71.6 million in 2014 to 78.4 million in 2016, an increase of 9.6%. Yet, this labour force is low on education quotient – 14% has post-secondary education, 36% has a secondary education and about 33% has no education (ADBG, 2019). With a major part of the working population possessing low skill, the right base for technological revolution does not exist, thus hampering its transformation to a high-skilled industrialization as well as continuing to bulge youth unemployment.



Figure 3.4: Changes in the working age population of Nigeria

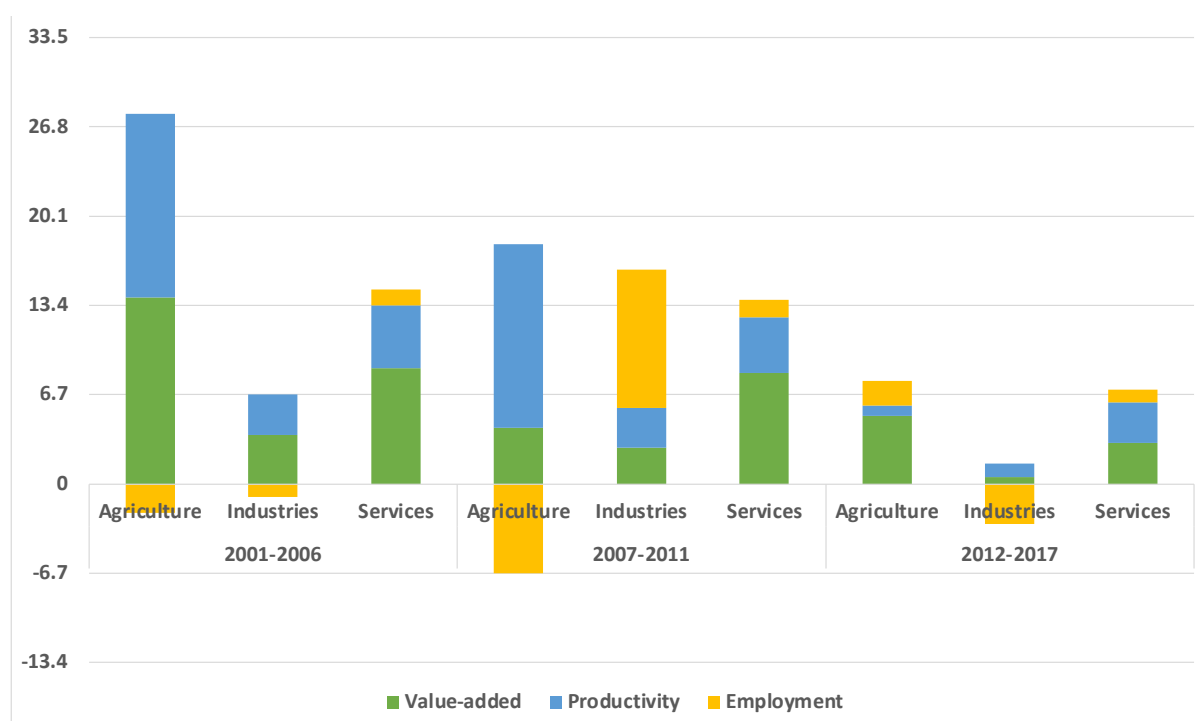


Data source: Revision of World Population Prospects 2019, UN DESA

Over the years, Nigeria has shown weak productivity trends reinforced by using obsolete technologies and technical know-hows lacking scalability. From Figure 3.5, the dominance of agricultural sector observed in 2001-2006 and 2007-2011 appears to have declined very sharply between 2012-17. Between 2011-15, the Nigerian government implemented the Agricultural Transformation Agenda to reverse the declining trend in agriculture by focusing on augmenting the supply of fertilizers, inputs and overall supply chain management resulting in improved employment and value-added levels. The productivity pattern in agriculture, however, continued to decline massively in 2012-2017. Farming in some key regions have taken a hit due to civil strife, particularly in the North-east affected by Boko-haram and in the South by farmer-herdsmen conflict (ADBG, 2019).

Employment growth has been meagre for the entire period of analysis; the only peak in employment can be seen in 2007-11 under the industries sector which was quickly reversed after the recession of 2016. Lack of proper infrastructure such as roads, potable water and stable electricity supply has inundated any progress in manufacturing. Often, firms resort to private supply of public services resulting in huge overhead costs that has led to decline in productivity, firm closures, and retrenchment, thus increasing unemployment.

Figure 3.5: Annual average growth in value-added, productivity and employment (%), 2001-2017

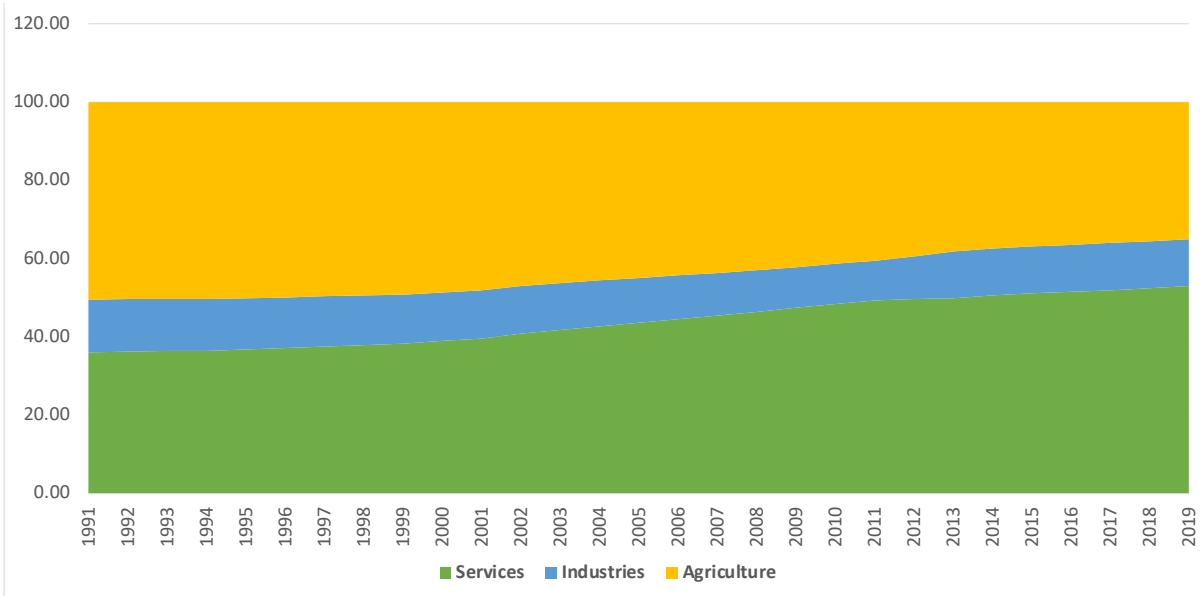


Calculations: ADBG, 2019; Data Source: ILO

Winding up of businesses in textiles and consumer goods production in 2008-2010 led to further fall in employment under industries sector, as shown in Figure 3.6. Services in 2015 accounted for some 51.12% of total employment, up from 43% in 2005. About 37% continued to be in agriculture while 12% of total employment was in industries. Although services continue to be the highest employer, the type of services that dot Nigerian economy are mostly informal or low-paying formal jobs, such as retail and trade. Increasing urbanization has led to youth migration from rural to urban areas in hunt for better opportunities, however employment growth has not kept pace with this trend. Due to this, Nigeria exhibits drastic spatial variation in distribution of its workforce with 70% of it being concentrated in urban areas alone. With a lacking industrial base that can absorb these huge chunk of labor, most urban areas have become a ground for informal sector development and estimates point “about 50-65% of the Nigerian economy is informal with approximately two-thirds of the new jobs being created in the informal sector” (ADBG, 2019). Nigeria also suffers from poor financial disposition of public enterprises that in turn pays grossly inadequate workers remuneration (Opone & Kelikwuma, 2021). With insufficiency in earnings, social security is often left lacking resulting in poor commitment to work and overall decreased levels of worker productivity. Compounded by corruption, distressed financial health, and move towards religious fanaticism, Nigeria is left unemployed, and crime infested (UNODC, 2019). Overall, Nigeria has a narrow industrial base with weak manufacturing

sector further compounded by structural inefficiencies such as absence of robust institutional frameworks and governance pillars to support the economic management of natural resources.

Figure 3.6: Sector-wise employment share in Nigeria, 1991-2019



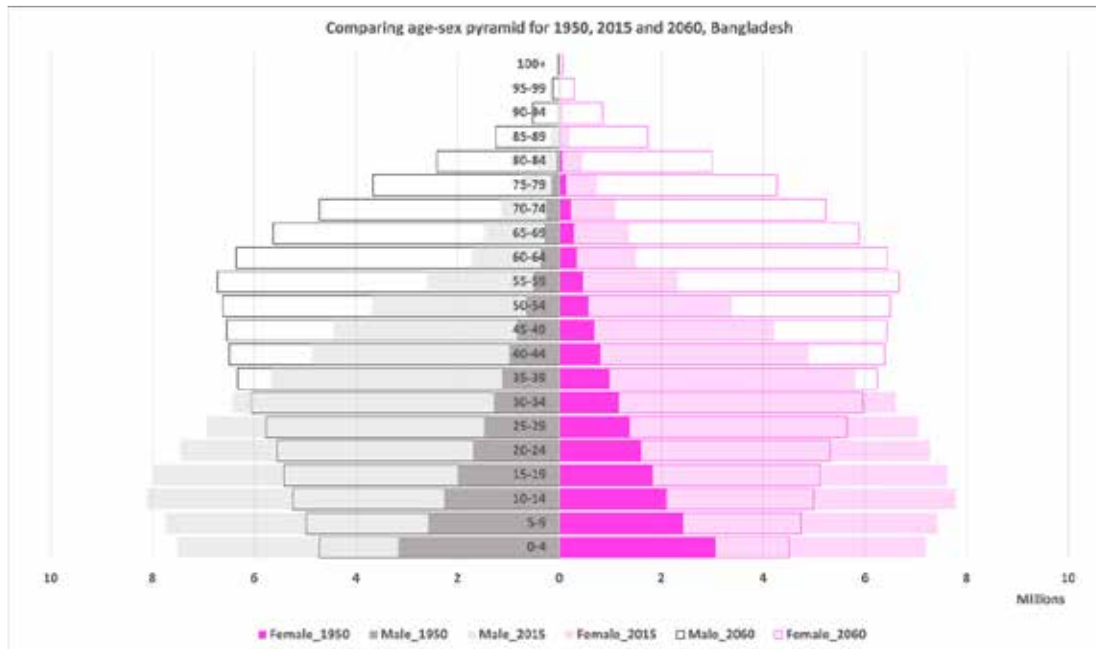
Data Source: World Bank (retrieved from ILOSTAT, 2021)

### 3.2.3. Bangladesh

Formerly East Pakistan, Bangladesh has come a long way since its independence in 1971 to its graduation from being a ‘least developed country’ into a developing one by 2024 (UNGA, 2021). At 164.6 million, Bangladesh continues to be the eighth largest country by population dominated by young people with 36.2% of the total aged below 20, 54.3% below 30, and 70.4% below 40. Cumulatively, this amounts to a working age population of 58.5% or about 96.43 million people (Bangladesh Bureau of Statistics, 2019). Child dependency is at 25.7% and old age dependency is 6%. The 2015 population pyramid also features a youth bulge, because of declining population growth, indicating that Bangladesh has already entered demographic dividend.

A closer look at the population pyramid for Bangladesh reveals that the economy has started contracting already and will have aged considerably by 2050, as shown in Figure 3.7. It exhibits a falling birth rate, declining death rate, and a life expectancy that has improved over from 1950 to 2050. This is the direct result of family planning programs, bolstered by neo-Malthusian discourse, and significant upgradation of health and sanitation system. The effect of family planning was such that the fertility per woman precipitously declined from seven children in 1980s to three children in 1990s (Streatfield & Karar, 2008). As Bangladesh is poised to enter an aging regime, it is pertinent that investments in health coverage and providing social safety net be augmented from current levels.

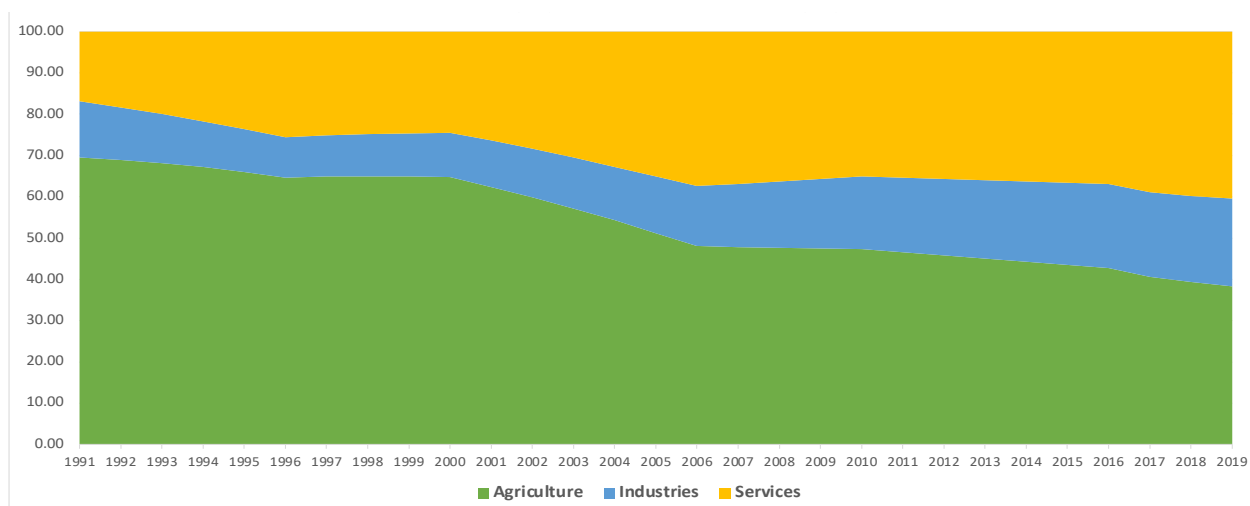
Figure 3.7: Changes in the Working Age Population of Bangladesh



Data source: Revision of World Population Prospects 2019, UN DESA

Out of the 164.6 million persons, the economically active people are 62.1 million of which 60.8 million, or 37% are employed. Roughly 2.6 million are unemployed and the unemployment rate in the country is 4.2%. From Figure 3.8, it is seen that over the years, agricultural employment has decreased and services as well as industries are absorbing more of the labor force, thus increasing net labor movements from low-productivity to high-productivity sectors. Exhibiting a similar trend as Nigeria, one-third of the population in Bangladesh has no education, while 29% has secondary education and above. The total percent of graduates in the country is only 1.29% (Bangladesh Bureau of Statistics, 2019). Bangladesh requires a re-calibration of its industrial sector by improving its technology adoption rate and re-skilling and up-skilling its current workforce.

Figure 3.8: Sector-wise employment share in Bangladesh, 1991-2019



Data Source: World Bank (retrieved from ILOSTAT, 2021)

### 3.3. Policy Implications

#### 3.3.1. Economic Implications

Improvements in medical science and public health have often led to life expectancy gains. In the last century, this gain was mostly concentrated in reducing mortality at younger ages, but the last few decades have seen a rise in life expectancy gain beyond 70 years of age, globally (Kassebaum, 2022). This additional time that individuals now have is an ‘economic value’ in itself. Age has become more malleable, i.e., “at every age, individuals have more future ahead of them than their predecessors could have expected to have”. (Scott, The longevity society, 2021) Yet, life expectancy gains in labour forces are today happening in economically inactive age groups that are also prone to poor health. This is substantiated by the fact that proportion of ‘life spent in good health’ has remained constant between 1990-2019 (Wang, 2020), which means that gains in longevity has manifested into an increased number of years of ill health. It is therefore pertinent that to fully benefit from the economic potential of an increased lifespan, the focus in policies must move towards first, facilitating a “healthy aging”, and second, towards exploiting the productivity of this labour force through “delayed retirement”.

#### *Healthy Aging*

The decade of 2021-2030 has been declared as the “UN Decade of Healthy Aging” (WHO, 2020). Healthy aging is defined as “the process of developing and maintaining the functional ability that enables wellbeing in older age” (WHO, 2020). Intrinsic to this definition is the fact that the human body’s functionality depreciates over time, but this rate can be controlled or modified through lifestyle choices that negatively impact health in the long run. It is therefore pertinent that the policy focus shift from curative healthcare to preventive healthcare. History of evolution testifies

that epidemiological transitions have made great strides in improving overall life expectancy of humans and hence, a clear focus on delaying aging is very much possible. This will keep the workforce population inflated and counting, ultimately leading to stability, if not enhancement, in economic productivity.

Challenges to healthy aging are manifold and requires urgent attention. First, the current public expenditure is asymmetrically focused on curative healthcare, tending to aftermaths of disease and morbidities. This leaves little space for investment in preventive healthcare options dedicated to reducing the disease burden. Research and development have disproportionately focused on specialization around a specific disease, whereas the study of prolonging a healthy lifespan has received little attention. One immediate economic benefit of adopting healthy aging at all stages of life is that it reduces the number of working days lost through sick leaves. Second, prevention policies need to be tiered at primary, secondary, and tertiary levels. Primary prevention averts the onset of disease and may include measures such as immunization and regular exercise routines such as 'yoga' and aerobics. Secondary prevention relates to early disease diagnosis and can be done through regular health check-up. Tertiary prevention deals with rehabilitating those that have suffered significant illness and may include constructing specialised facilities such as old-age homes, asylums, etc. (CDC, 2021). Current systems are highly asymmetric in improving child related mortalities. Investing in primary and secondary prevention can directly improve elderly mortalities and provide more workforce population. Third, government needs to take a better look at social and environment policies to foster healthy aging and prevent the rise of non-communicable diseases. Environmental initiatives such as Clean Air and Water Act, anti- smoking campaigns, increased green recreational spaces, have achieved a significant preventive impact on public health (CDC, 2021). On the social side, unhealthy eating, lack of exercise space and facility, poor housing conditions and lack of proper transport networks and modes can often cut-off access to healthcare services. Finally, it is in the interest of human race to now design a health index to target salubrious life expectancy on similar lines as measuring carbon emissions or inflation. Integrating big data into individual health monitoring will make individuals responsible towards maintaining a healthy lifestyle since early age (Scott, The longevity society, 2021). An array of policies can lead to healthy aging and, when structured suitably, can interact and be self-reinforcing.

#### *Delayed Retirement*

Extending working lives commensurate to increasing life expectancy is one of the most potent macroeconomic decisions as it has the potential to raise GDP levels and accordingly, provide additional resources to finance social programs. With an increasing number of inactive to active workers ratio, the dependency is likely to double if the proportion of active workers is not enlarged. One policy measure that fosters longer work life is delayed retirement. Retiring imposes the challenge of income loss at individual's level and an increased public expenditure on the economy's level. Whereas prolonging careers can solve for this immediate issue, it nevertheless has a risk of "skill obsolescence" (Scott, The longevity society, 2021). To tackle this, workforce policies will have to find a fine balance between both demand and supply side of the

market. On the supply side, education policy will have to be redesigned to enable lifelong learning. Adult education, mid-career professional programs and skill development training practices will have to be adopted as a matter of public policy. On the demand side, remaining economically active will require incentivization such as increased health benefits for elderly people choosing to work beyond minimum retirement age. Pension and welfare reforms will also greatly drive retirement decisions. Governments may need to adopt policies such as increasing the required periods of contribution to pension funds, withdrawal of early retirement schemes and raising the age at which pensions become payable. It will also require a re-think of the long-term unemployment benefits and disability support schemes.

Increased retirement may be an ire of younger workforce if the employment rate of the economy is inadequate. Often employers are clouded by the ‘lump of the labor fallacy’ which assumes that there is fixed amount of work to be done (Federal Reserve Bank of St. Louis, 2021). Hence, no new work can be created and only redistribution of work from the economic pie is possible. Thus, boosting employment opportunities for older workforce will cut down those available for the young cohort. This may not be true and for that matter, economic pie is not a fixed quantity. Enabling elderly workforce participation will require changes in both government as well as corporate policies. With increasing number of elderly consumer base and higher penetration of technology and automation, employers are likely to hire more elderly workers.

### 3.3.2. Social Implications

Aging has a profound implication on how life is structured and the consequent behavior around “education, work, marriage, fertility, and retirement” (Scott, The longevity society, 2021). Changes in societal structure dominated by elderly population will require social policies to act on their behest. But more so, it will impact how lives will transform at each stage of growth to become more adaptive and healthier to live a longer active life. It is important to note that the five stages discussed here do not limit the emergence of new phases of life. In fact, as the 20<sup>th</sup> century saw the emergence of teenage and retirement age, the 21<sup>st</sup> century is likely to see newer epidemiological transitions (Scott, The longevity society, 2021). It is therefore pertinent to study the challenges and opportunities that each stage of life presents to the discourse of aging.

#### *Education*

With the falling young base, budgetary investment in initial education may see a fall and that presents an opportunity for the government to use greater revenue in disseminating adult education and vocational training. Aging and longer lives will imply a continued passion for lifelong learning if the economy aims to keep its elderly demography a part of the working population. Employers often believe in the depreciation of productivity levels of older workforce while at the same time they are thought to be out-of-date with the understanding of latest technology and technical know-hows. The challenge with this belief is that either companies will not hire older worker or will lay them off if presented with a younger counterpart, which can result in unemployment among the elderly (Neumark & Burn, 2019). As a matter of state policy,

governments need to design and invest in up-skilling and re-skilling of its aging demography stretched between mid-career to end-career professional phase. Curriculum revisions and introduction of new professional degree programs accommodative of adult education may generate a new vigor for learning. Catering to the educational and skill requirement of older workforce will also generate a market and enhance enrolments for such degrees, thus also forming an additional revenue source for government.

### *Work*

Returning to labor force post-retirement is not easy. It is also not possible for everyone to keep working in the same position for a prolonged period of their career. Therefore, it is important to diversify the contingent economy that consists of part-time jobs, flexible work hours, contract economy and gig workers, suited to employ an elderly workforce. There is also a growing trend in entrepreneurship where participation is high among the post-retiree population. For example, the United Kingdom has “over 40% of working people aged 65 years or older self-employed, which is much higher than for any other age group” (Scott, *The longevity economy*, 2021). Second, work is an important ‘social network’ in itself. Often retirement leads to a break in this network and senior citizens are resorted to a lonely, secluded life. This can lead to a rise in mental issues, suicide rates and other fatalities. Additionally, as this is the age where elderly people experience a lot of deaths of near and dear ones, it can manifest into shortening the happy life period. Thus, having a long work life will also foster longer networking time and keep the established social connections blooming. The longer the workforce remains active, it will lessen its dependency on government for social security and disability funding in addition to being an active GDP contributor of the economy.

### *Marriage*

Marriages are now more delayed and short-lived than ever. Becker’s economic rationality for marriage, that “a person decides to marry when the utility expected from marriage exceeds that expected from remaining single”, has several implications today (Mishra, 2016). As per this theory, gains in per capita income have more propensity for creating single households as observed today. Yet, single households may not be desirable because of high public cost burden with increased medical assistance; cash and food assistance; housing, energy, and utility assistance; and development and childcare assistance. Single motherhood is also associated with higher poverty levels, particularly of the children (NBER, 2006). On the other hand, with increasing number of female participations in the labour force, marriages lead to higher median family income and gives increased purchasing power to households (Pew Research Center, 2010). Married parent families are also seen to commit greater time and resources for the upbringing of their children, thus raising chances to better education and job opportunities (Howard & Reeves, 2014). This serves two purpose – first, it allows for greater participation in labour force and second, it improves the inter-generational income mobility. The other extreme is marriage at early age which impacts education, skill acquisition (opportunity cost) and consequently, employment. In Nigeria, there are 22 million child brides (UNICEF & UNFPA, 2018) and Bangladesh exhibits 50% child marriage rate (UNICEF, 2017).



### *Fertility*

The influence of Malthusian collapse was so strong that several countries embraced eugenics and adopted draconian measures to curtail family sizes through strict one- and two- child policies, and even forced sterilizations. These mortality shocks had a opposite bearing: “the wealthiest nations with the greatest food security have the lowest fertility rates, whereas the most food-insecure countries have the highest fertility rates” (Shermer, 2016). The overall result is that working populations have contracted beyond replacement and dependency is on a stark rise. Family planning policies needs a revisit in developed nations by enacting pro-fertility policies such as “subsidies to women upon the birth of a child, more generous maternity leave policies, childcare subsidies and family assistance packages via the tax and transfer system” (Guest & Swift, 2008). Developing nation that still have an edge over replacement fertility rate will need to create education, skilling, and employment opportunities to keep the burgeoning workforce productive. Another emerging trend is of late marriages, with age of woman at first marriage rising from 25.2 in 1990 to 31.8 in 2019 in UK (Scott, The longevity society, 2021), from 24 in 1990 to 28 in 2020 in US (U.S. Census Bureau, 2021) and from 25.5 in 1985 to 29.4 in 2020 in Japan (Statistics Bureau, Japan, 2021).

### *Retirement*

Long lives will necessitate a longer career, unless “real wages rise enough to support longer leisure time” (Scott, The longevity economy, 2021). As life continues to be longer, yet real wage growth rate continues to stagnate (Summers, 2016), it is important that retirement be extended to keep the balance. For extending retirement, it is prudent to re-define aging in the current context. Two related concepts are that of ‘age inflation’ and ‘prospective aging’. Just like in economics, understanding of how expensive goods or services have become over a period requires adjusting for price inflation, on similar lines, to account for underlying health of an individual, age needs to be adjusted in real and nominal terms to allow for age malleability (Shoven, 2008). Age, if be adjusted for improvements in mortality rates by gender and race, would raise pension entitlement eligibility by 0.15 years annually (Shoven, 2008). On the other hand, the concept of prospective age looks at forward measurement of longevity whereby old age is measured as 15 years or fewer remaining of the traditional life expectancy (Sanderson & Scherbov, 2010).

## 3.4. Policy Recommendations

### 3.4.1. General Recommendation - Aging v. Longevity effect

In demographic discourse and economic planning, aging has often taken precedence over longevity. Aging is measured by using indicators such as shift in the population’s age distribution toward older ages, rise in the population’s median age, increase in average life expectancy, number of remaining years left to live, and dependency ratios (Chang, Skirbekk, Tyrovolas, Kassebaum, & Dieleman, 2019). In a population pyramid, aging focuses on horizontal axis gains, but longevity highlights the significance of vertical axis, representing life expectancy. Aging

measures changes in the age-structure alone, which fails to account for population morbidity. Longevity, on the other hand, accounts for changes in how we age and the exploitation of life expectancy gains. To capitalise life expectancy gains, the focus of policy making must shift from aging society to that of a longevity society (Scott, The longevity society, 2021).

### 3.5. Country-specific recommendations

#### Japan

Japan is posed by inherent risk of decelerating economic growth in which technology has come to aid its recovery. As a matter of labor policy, Japan has relied on the usage of automation and artificial intelligence (AI) to build its road for continued prosperity. Japan’s robot density – defined as “number of robots relative to humans in manufacturing and industry” – is the fourth highest in the world, as shown in Figure 3.9 (IMF, 2018). Yet, automation has largely replaced labor only in certain manufacturing sectors such as automotive and electronics, and its seepage has remained low in services sector, which accounts for about 75% of GDP. Japan will need to proliferate its usage of robots, AI, and automation to services sector.

Figure 3.9: Robot Density (Number of robots per 100 workers)



Source: International Federation of Robotics, World Robotics, 2017 – Industrial Robots

The problem with technology fuelled disruption is that it places an enormous burden on upskilling the workforce. As demand and forms of skill required by industries change, supply is often constrained by both quality and quantity to keep pace (OECD, 2021). Notwithstanding the positivity of automation, Japan will still need to tackle risks of labour polarization and societal pressure of displacing low-skilled and non-regular workers such as woman, whose participation has been particularly high in the last decade.

Accelerating upskilling and embedding lifelong learning in education as well as corporate structure will be a key to matching the technology supplemented productivity levels to keep the

economic growth afloat. Government, academia, and industry will have to come together to orchestrate innovative training solutions for adult learners (IBM, 2018). This will also aid the diversifying labour market where Japan has continued to grow its typical (regular workers) and atypical employment consisting of part-timers, *arubaito* or side-job workers, dispatched workers, and contract workers (Suzuki, 2004).

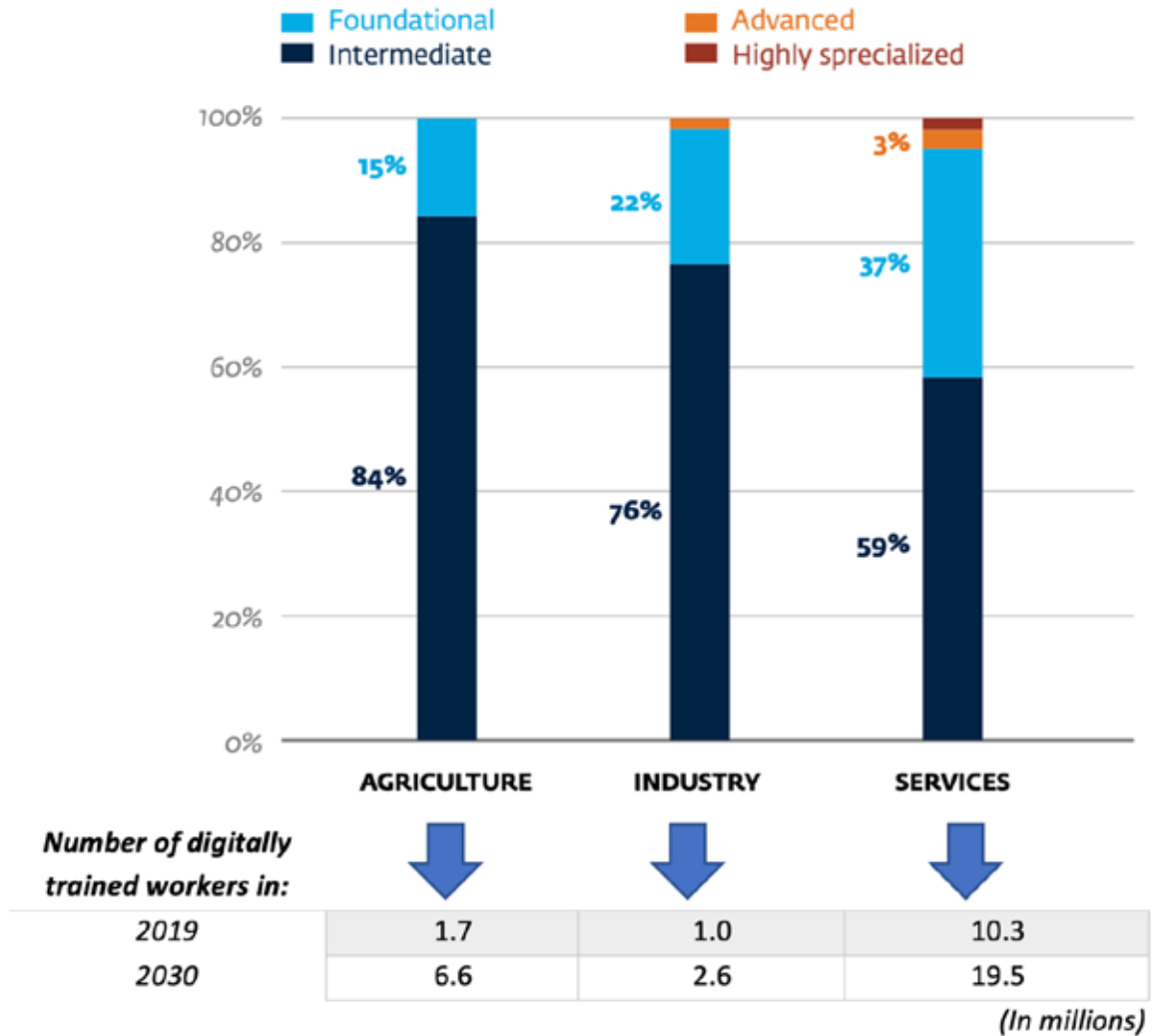
Further, Japan's strict immigration policy limits its reliance on foreign workers to supplement for labour shortages. While recent push to increase the influx of highly skilled foreign workers (Reuters, 2021) go in the right direction, Japan can further push reforms in this area. Orchestrating a quota system based on domestic needs, benchmarking foreign education and skills to Japanese standard qualification framework, and allowing low-skilled labour in guest workers program can be pursued as part of labour immigration policy (IMF, 2015).

It is one thing to spend on technology to compensate for loss in healthy life of an individual and completely other to have healthy individuals and spend more in developing technical capacities for improved productivity. As people in Japan continue to live long, focus on preventive healthcare will additionally keep the workforce buoyant for the economy. Investment in healthcare industry must also confirm to prolonging healthy aging of the current demography.

### *Nigeria*

Nigeria's disparate and persistent emphasis on the extractive sector has resulted in considerable neglect of other important sectors of the economy with high employment potential such as agriculture and construction. Increased investment in agro-based industries and physical infrastructure can strengthen the production economics in Nigeria both in terms of labor employment and capital deepening. The biggest constraint to sectoral development is lack of skilled labor. Nigeria must progressively invest in improving educational attainment and vocational training of its youth and working age population. Of paramount importance is digital skill, as about half the total skill requirement by 2030 is going to be of digitally skilled workforce, seen in Figure 3.10 (IFC, 2021). While foundational skills inculcate rudimentary understanding of digital devices and applications, intermediate and other higher forms require some level of application in tasks or ICT related occupations. In Nigeria, it is the demand of intermediate skills that will be of higher consequence.

Figure 3.10: Nigeria's demand for digitally skilled labor force in 2030 (predicted) by sector and proficiency level as percent of total labor force



Sources: Oxford Economics; LEK Research and Analysis

In addition to improving the labor supply, it is also important that the demand for labor should be increased to match the burgeoning working population of Nigerians. To aid this, work portfolio should be diversified to include part-time, contract and side-work jobs to allow for greater absorption of the workforce. Given the larger footprint of informal or grey economy, Nigeria should look at expanding gig economy jobs to help semi-skilled and low-skilled workers with employment. As techniques and technologies become outmoded, it is important to introduce new technology that are scalable and replicable. Such modernization can help in the growth of both capital assets as well as assist in improving productivity per worker.

## Bangladesh

As Bangladesh aims to move up the ladder of economic production and diversification of its export base, it is important that the country improves firm productivity and creates better paying jobs. This is important to capitalize on the demographic dividend that it currently enjoys. The quality of the labor force needs to be upgraded in terms of skill and education to match the needs of the market. Although education levels have been improving in Bangladesh, it still doesn't match with industry standards. Bangladesh will have to heavily invest in re-skilling and improving learning outcomes. This alone will help the current youth bulge find jobs. Cutting down under-employment and unemployment is crucial for Bangladesh to help ensure productivity levels of labor is matched equally with production potential. One way to overcome this issue is to propel multi-skilling in current workforce by training them in ICT skills, cognitive skills, complimentary skill, and specialist skills.

The ready-made garment (RMG) industry in Bangladesh, that forms 80% of exports and 12% of GDP, has long relied on low-cost labor for its competitive edge over close competitors such as China, India, and Indonesia. But with penetration of newer technologies and automation in RMG manufacturing, the current labor force—low on skill and education— will soon be out of jobs. The effect will be more pronounced for women workers than their male counterparts as they have lower formal education on average and exposure to digital literacy. Machines are also slated to become cheaper than the low-cost labor – an existential threat to Bangladeshi economy. It is therefore important for Bangladesh to not just allow greater penetration of technology in its processes, but also to ensure that the workforce is skilled and reskilled to keep pace with changes in technology. EdTech services can be used to deliver necessary reskilling and upskilling opportunities, especially to the female labor force which in turn can also narrow the gender skill gap.

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## 4. Education and Skills in an Aging World

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*Smriti*

### 4.1. Introduction

Productivity is typically regarded as age-related: prime age workers, ages 25-54, are the highest productivity age group. More broadly, the working-age population (aged 15 to 64 years old) are considered essential to support the economy and to have positive impacts on labor productivity and capital formation (Aiyar, Ebeke, & Shao, 2016; Maestas, Mullen, & Powell, 2016). However, this association can be misleading if other variables such as education, the ability to build workers' skills, and women's role in the labor force are not considered. The expectation that older workers will reduce average productivity may be fueled by the perception that the aged are less healthy, less educated, less up to date in their knowledge, and more fragile than the young. Burtless (2013) states that in the case of the United States there are huge differences between labor force participation of older populations contingent on their education level. In fact, older populations with lower levels of schooling have low employment rates, and this may affect productivity measures of older populations.

If older workers continue to develop their human capital after their formal education, adapt to recent technologies, and have longer work experience, their productivity might not be lower than that of younger workers. While other authors show mixed effects, Burtless (2013) states that in the case of the United States there are huge differences between labor force participation of older populations contingent on their education level. In fact, older populations with lower levels of schooling have low employment rates, and this may affect productivity measures of older populations. Lee, Song and Won Kwak, 2020 show that, on average, older workers exert positive effects on labor productivity across all industries when they are low-educated in Japan and high-educated in Korea. However, when older workers are better educated and continuously developing their human capital with longer work experience and adaptation to new technologies, their productivity could be higher than that of younger workers (Lee et al., 2020).

The implications of an aging population and education on labor markets and productivity will depend on several variables that need to be addressed. The purpose of this section is to understand the relationship between education and the aging population of Bangladesh, Japan, and Nigeria according to their demographic structures and economic context. Additionally, the section will show two approaches that can help to deal with the aging populations and that are directly related to education: gender and migration. The section will be divided in two subsections: a country specific profile, and the policy recommendations.

## 4.2. Japan

### 4.2.1. Education and Training

Japan has an excellent education system. It has been the top performing country for years. Although globalization, modernization and rapidly changing economy and socio-economic conditions have posed new challenges in terms of academic and civic responsibilities shaping the future of society in Japan. To ensure a sustained growth model, it is important that Japan adopts a well-rounded comprehensive education model, to build on its strength and to ensure that Japan is able to transition into the 21st century with advanced skills and education excellence. Japan has both a centralized and decentralized governance system to ensure holistic education plans are formulated. The Basic Act of Education allows the central government to make comprehensive education plans as well as the local governments to make plans best suited for the local circumstances. Overall, the national government has to maintain and improve the level of education and formulate strategies and infrastructure provisioning at the national scale.

Japan follows a single-track system for education similar to the US model. Preprimary education for children of age 3-6 is provided by Kindergartens and Nursery schools with an enrollment of 96% in 2016 (OECD, 2016). Japanese students attend primary school for five years before lower secondary education. This is open to all the children and is mandatory. After primary education, students complete a three year lower secondary and upper secondary education for another three years. This is followed by a diverse structure for tertiary education.

With globalization, there has been a shift in skills required in the workspace and upcoming jobs. With the shrinking and aging population, the country is facing a demographic decline which has led to significant changes to the employment and industrial structures in Japan (OECD). To respond to these challenges, the government of Japan created the Council of Implementation of Education Rebuilding, aiming to put education at the center of Japan's growth. Further, the third Basic Plan for Promotion of Education plans to transform upper secondary education for better transitions to university, along with university selection process and education. Some of the key takeaways from the (OECD, 2021) report are:

- In Japan, men are more likely than women to pursue a vocational track. In 2019, 57% of upper secondary vocational graduates were men, compared to 55% on average across OECD countries.
- 64% of 25–34-year-old women had a tertiary qualification in 2019 compared to 59% of their male peers.
- In 2018, Japan invested a total of USD\$10,185 per student on primary to tertiary institutions compared to USD\$10,454 on average across OECD countries. This represents 4% of GDP, compared to 4.9% on average across OECD countries.

- In 2019, 94% of 3–5-year-olds were enrolled in early childhood education and care programs and primary education in Japan, compared to 88% on average across OECD countries.
- Further, adults in Japan display the highest levels of proficiency in literacy and numeracy among adults in all countries participating in the survey.

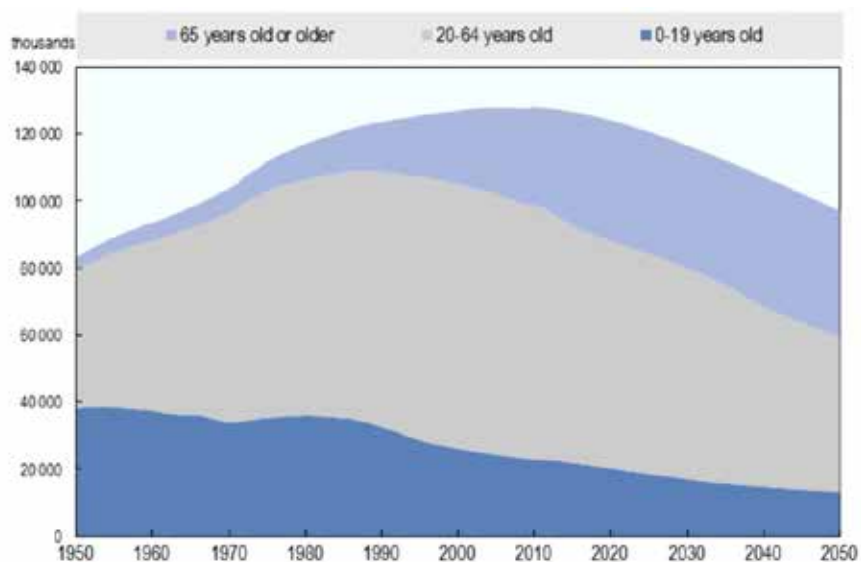
#### 4.2.2. Education Economy and labor force participation

With the high levels of academic proficiency to translate into economic growth and well-being, competences must be put to their best use. Japanese employers do not appear to be making the best use of their workforce's competencies. And returns to proficiency in terms of higher wages and employment rates are lower than in other participating countries. After the United States and China, Japan is the third largest economy with Gross Domestic Product at USD\$4125 billion (OECD, 2017). However, since the 1990s Japan's GDP has declined below OECD average in 2015.

The Japanese economy is concentrated on services which accounts to 72% of the total GDP, while industry contributes to 27% and agriculture adds to 1% of the total GDP (OECD, 2007). The overall unemployment rate is highest among the OECD countries while the unemployment rate is the lowest. Studies suggest that one-third of the workers in Japan are overqualified for jobs. The asset price bubble burst in the early 90s led to Japan's economy in turmoil. The declining growth shifted Japan's lifetime employment model, and the labor reforms gave firms incentives to explore alternative forms of employment. The share of non-regular workers increased from below 20% to almost 40% in 2017 (OECD, 2018). This fueled the increasing inequality in income, strengthened labor market dualism and gave rise to a working poor population.

The demographic transition in Japan is combined with the decline in economic issues faced by the country. Japan's population peaked in 2010 with about 125 million people and since then it has seen a steep decline to reach less than 100 million in 2050. Fertility rate and life expectancy combined has exaggerated the issue with the share of elderly rising from 5% in 1955 to more than 25% in 2014 (OECD, 2017).

Figure 4.1: Japan's population and age structure, 1950-2060



Source: OECD 2017, "Labor Force Statistics: Population projections"

Maintaining good education performance should be a priority given its important link to economic growth. Countries with more human capital innovate faster, thereby achieving greater productivity gains. This requires improving the education system and adapting it to the new challenges of a fast-changing world. In addition, more training is needed for workers. However, the heavy reliance on non-regular employment tends to limit on-the-job training. Addressing the duality of the Japanese labor market is therefore a priority and would have the double benefit of reducing inequality while supporting growth. This requires a comprehensive approach, including an adjustment in the employment protection for regular workers combined with more training and better social insurance coverage for non-regular workers.

Japan is also a leading country in terms of R&D, although this is not fully reflected in its innovation performance. Cooperation among universities, government and research institutes needs to be enhanced through greater mobility of researchers and boosting the share of public research funds for universities that is allocated competitively. Upgrading tertiary education, in part through stronger competition and internationalization, would not only increase human capital but would also boost the role of universities in innovation.

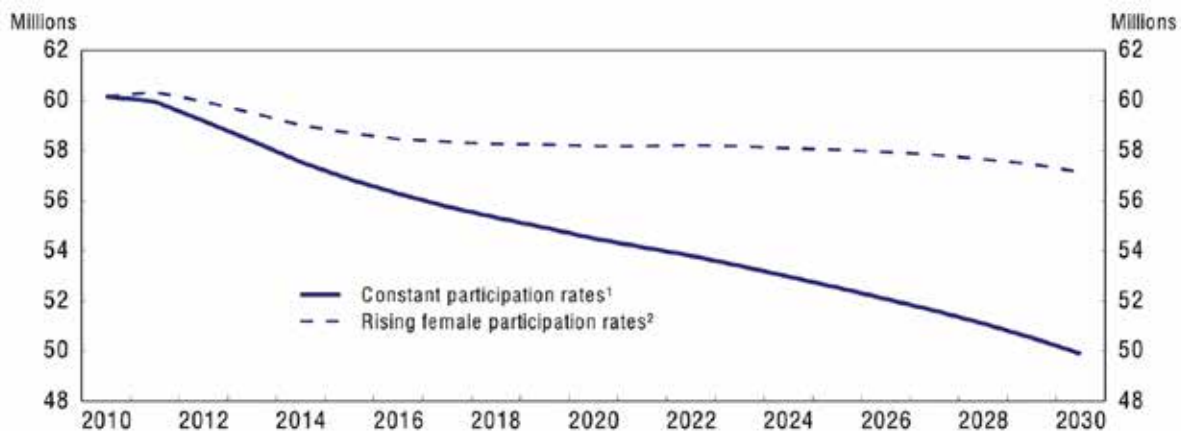
Stronger competition and regulatory reforms in the service sector would not only boost innovation but also support the productivity of services which has lagged that in manufacturing in recent years. This is even more important, given that services account for 70% of value added and employment in Japan. Strengthening competition is the key to improving productivity in this sector. Reform in social security programs to limit spending increases, while providing a sound funding source for pensions will bolster confidence in a fiscal plan. Further opening the economy

to foreign goods, capital, and workers and mitigating the decline in the labor force by boosting participation, particularly of women, can prove to be very useful for a sustained economic growth of Japan.

#### 4.2.3. Female Literacy and Female labor force participation

Reducing persistent gender inequalities in economic opportunities and outcomes is essential for fairness and equity, as well as to support Japan's long-term growth. In particular, greater female labor force participation would help mitigate the effects of rapid population aging. If female participation rates were to converge to male levels over the next 20 years, Japan could avoid a dramatic decline of its labor force and the associated fall in potential growth (Figure below). But raising female participation requires a comprehensive approach, with actions on several fronts.

*Figure 4.2: Projected number of persons aged 15-64 in the labor force (2010-2030)*



Source: OECD Calculation of population and demography

Gender pay differences in Japan are the second largest in the OECD countries. Students' field of specialization differs substantially by gender and female employees are concentrated in the medical and welfare sectors, but they are under-represented among academics, in the technology sector and among public servants. Furthermore, women are less likely to be in regular employment and thus account for 70% of the relatively low-paid non-regular workers. When in regular jobs, women often end up in support and administrative positions, rather than career tracks for management positions.

Traditional notions of gender roles remain important in Japanese society. Although women tend to continue working after marriage, around 60% withdraw from the labor market at the time of childbirth. Mothers returning to work face difficulties in finding regular jobs, in part due to age-barriers to entry into regular employment. Over 50% of women work part-time or as temporary agency workers, which are usually classified as non-regular employment. (OECD, 2012).

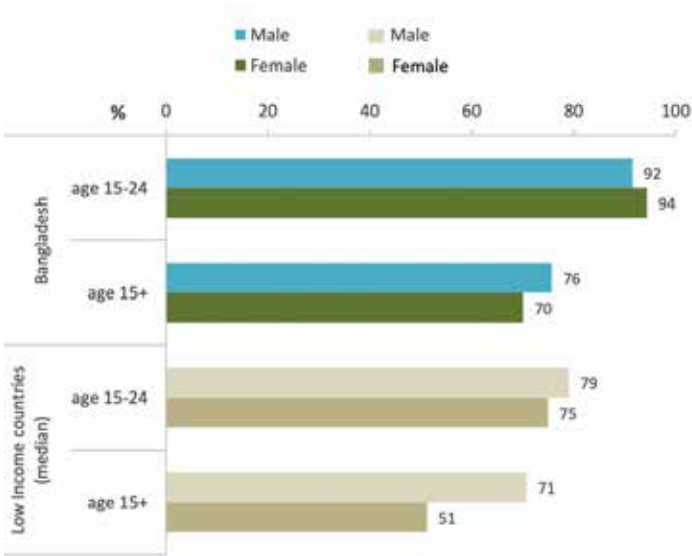
Raising awareness among young women about the likely consequences of their educational and occupational choices for career and earnings progression through information campaigns and school-counseling can improve labor force participation. High-quality affordable childcare to all parents and encouraging a more equal sharing of parental leave and setting realistic and measurable targets for female representation in senior management in the public and private sectors is critical.

### 4.3. Bangladesh

#### 4.3.1. Education and Training

Bangladesh is committed to the SDG goals including SDG4, which is the overarching education goal. This goal aims to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” Bangladesh has two ministries for the education sector, namely, the Ministry of Primary and Mass Education (MoPME) and the Ministry of Education (MoE). School education is divided under the authority of the two ministries in a centralized governance structure, enabling an efficient form of governance. Bangladesh aims to achieve and prioritize education and human development in alignment with the SDG targets and development aspirations for an emerging middle-income country.

Figure 4.3: Literacy rate among youth and adult population



(Source: World Bank 2018, Retrieved from National Education Profile 2018 Update, Bangladesh)

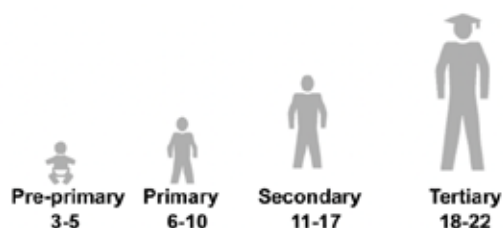
Bangladesh has displayed a long-term commitment to education and poverty reduction. Along with this, the demographic characteristics including abundant youth population, fast pace of urbanization, increasing efforts for poverty reduction and utilizing the maximum potential of human capital pose both an opportunity as well as challenges.

Figure 4.4: Socio-Demographic profile of Bangladesh

Indicators	Estimates					Projections	
	2001	2005	2011	2015	2018	2025	2030
Populations (in million)	130.5	137.8	149.7	158.9	164.6	172.4	178.9
Annual growth rate (%)	1.4	1.49	1.37	1.37	1.37	0.92	0.75
Fertility rate	2.6	2.5	2.1	2.1	2.1	1.02	0.93
Sex ratio (males per 100 females)	106	105	104.9	100.3	100.2	101.7	101.3
Population under 15 years (% of total)	37.6	35.8	32.4	29.8	28.1	24.7	22.9
School-Age Population % (5-14 years)	24.6	23.7	22.0	20.2	19.0	16.7	15.6
Population density	981	1068	1147	1200	1240	1324	1375
Urban population (%)	23.8	27.7	28.0	28.4	37.8	42.0	45.6
Literacy rate (7+ years)	46.2	52.1	55.8	63.6	73.2	79.8	87.1
Female Literacy rate (7+ years)	41.8	48.8	53.2	61.6	71.2	78.9	86.7
Poverty rate	48.9	40.0	31.5	24.3	21.8	11.2	3.8

Source: Bangladesh Bureau of Statistics (BBS), United Nations Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1, and World Urbanization Prospects: The 2018 Revision.

In Bangladesh, the official primary school entrance age is 6. The system is structured so that the primary school cycle lasts 5 years, lower secondary lasts 3 years, and upper secondary lasts 4 years. The education system in Bangladesh is divided into 4 levels or stages. The first is the Primary level, which incorporates grades 1 to 5. The second is Secondary level, which covers grades 6 to 10. Then there is a Higher Secondary level, which consists of grades 11 and 12. If a student wishes to pursue further studies, tertiary education institutions are available. There are 11 government universities in Bangladesh and some 20 private universities that provide tertiary education. Students can choose to further studies in engineering, technology, agriculture and medicine at a variety of universities and colleges. The official school ages by level of education are shown below:



Over the last decade, Bangladesh has made significant progress in expanding access to education. Particularly in SDG 4.1 which is access to primary education with almost universal access to primary education. The country's net enrollment rate at the primary school level increased from

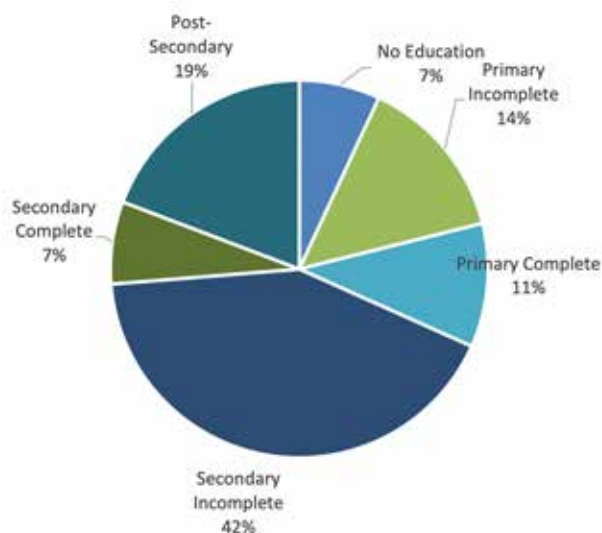


80 percent in 2000 to 98 percent in 2015, and secondary school net enrollment is now around 54 percent, up from 45 percent in 2000. While the gross enrolment ratio of secondary students increased from 52.43% in 2011 to 74.36% in 2020 (UNESCO, 2017).

Out of the total students enrolled in schools, about (53%) are enrolled in primary education, (21%) in lower secondary and (23%) in upper secondary education. Figure 4.5 below shows the highest level of education reached by youth ages 15-24 in Bangladesh. Although youth in this age group may still be in school and working towards their educational goals, it is notable that approximately 7% of youth have no formal education and 14% of youth have attained at most incomplete primary education, meaning that in total 21% of 15–24-year-olds have not completed primary education in Bangladesh (EPDC, 2018).

The percentage of out of school children in a country indicates the proportion of children who are not currently participating in the education system and who are, therefore, missing out on the benefits of school. In Bangladesh, 10% of children of official primary school ages are out of school and 22% of children of official secondary education ages are out of school. Further, it is noted that the majority of out of school students both in primary and secondary education were found in the poorest quantile. Males from the poorest households are more likely to drop out of school than the wealthier households and female children. (MICS, 2019)

*Figure 4.5: Education attainment, youth ages 15-24*



Source: EPDC extraction of DHS dataset 2014

One of the reasons for the males for poorest households dropping out of school can be child labor for economic imperatives.

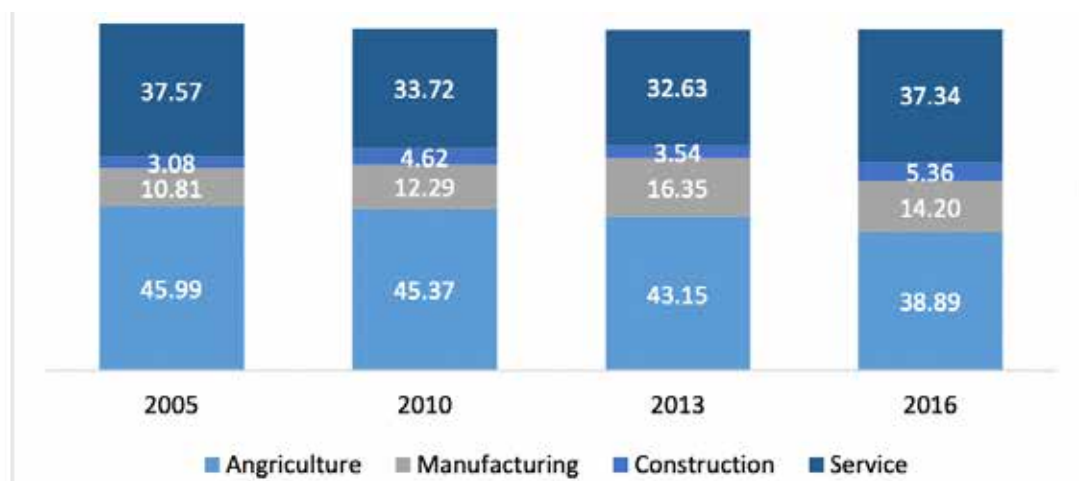


### 4.3.2. Economy and Labor Force Participation

Bangladesh's workforce of 87 million is largely undereducated (only 4 percent of workers have higher than secondary education), and the overall quality of the country's human capital is low (World Bank, 2016). In general, students have weak reading skills, and curricula, teaching approaches, and examination systems at all levels focus more on rote learning than on competencies, critical thinking, and analytical skills. Low relevance of tertiary education and skills training is another issue of concern. The World Bank Enterprise Skills Survey 2012, for example, showed that employers believe graduates of Bangladesh's higher education and training programs are inadequate for today's and tomorrow's labor market.

Structural change in the economy as the country moves to the middle-income status - with employment and GDP share shifting from farming and agriculture to industry, manufacturing and services -- is changing the composition of employment. This change has significant implications for education and skills development. It is projected that by 2030, the share of the labor force engaged even in skilled agriculture and forestry may decrease significantly, and that of managerial/professional/technical jobs in all sectors may increase significantly.

*Figure 4.6: Share of labor force (%) engaged in broad economic sectors of Bangladesh*

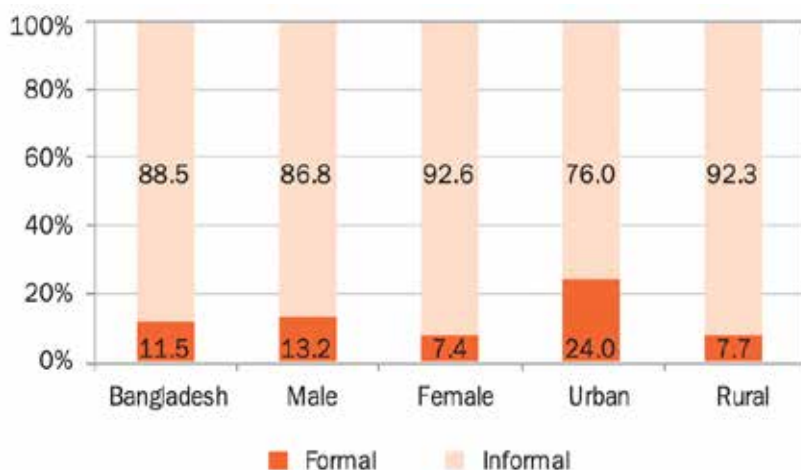


Source: Labor Force Survey (LFS) 2016-17, Bangladesh Bureau of Statistics, Retrieved from Education Sector Analysis (ESA) for Bangladesh, Globalpartnership.org

The official unemployment rate in Bangladesh is quite low, hovering between 3% and 5% for the last 20 years, lower than the rates in most countries (World Bank, 2021). But the labor force participation rate in Bangladesh (58%) is also on the lower end (BBS, 2018). The unemployment rate is not an accurate measure of joblessness because the methodology applied does not necessarily consider everyone of working age who doesn't have a job including those underemployed and marginally attached workers working part time or at a very low wage or

discouraged workers who may have given up looking for a job. Based on a labor force survey conducted in 2010, informal employment in Bangladesh is estimated to account for about 89% of the total number of jobs in the labor market (ADB, 2010). It is more prevalent in the rural areas than in urban areas. Women are also more likely to be under informal employment arrangements. Those working in the informal economy include wage laborers, self-employed persons, unpaid family labor, piece-rate workers, and other hired labor. The informal sector accounted for more than 40% of the Gross Value Added (GVA) of Bangladesh in 2010 with higher contributions from agriculture, fishery, trade and industries with lower capitalization (ADB, 2010).

*Figure 4.7: Profiles of the main job of the employed population in Bangladesh: Employment by Nature of Employment, Sex, and Urban/Rural*



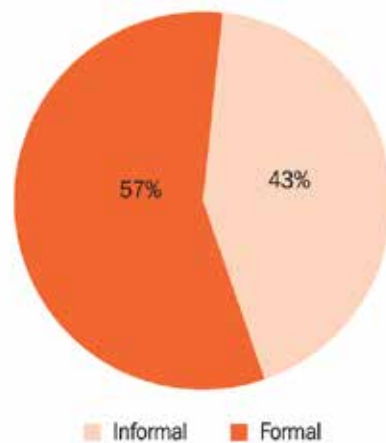
Source: 2010 LFS and ISS data, retrieved from ADB report: Informal sector and Informal Employment in Bangladesh

Almost 44% of informal workers are people with no education: 24% of informal workers have primary education and 21% have lower secondary education. Only 7% of informal workers have senior secondary education while only 1% have tertiary education.

Estimates suggest that most jobs are generated by the informal sector in Bangladesh. Almost four-fifths of the jobs in the country (77%) are in the informal sector. While 18% of the total jobs are accounted for by the private households (paid domestic workers etc.). Only 4.9% of the total jobs are in the formal enterprise, meaning that only 5 of 100 people in Bangladesh are employed in formal enterprises (ADB, 2010).

*Figure 4.8: Contributions of Formal and Informal sector to Gross Domestic Product (GDP)*

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Source: 2010 ISS Phase 2 data, retrieved from ADB report: Informal sector and Informal Employment in Bangladesh

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The highest contribution to GDP from the informal sector is accounted for by agriculture, trade and manufacturing industries. While the highest contribution to GDP by the formal sector is accounted for in manufacturing, transportation, community and other private sectors (ADB, 2010).

Between 2000 and 2017, the share of high-skill employment has increased by 16% in Bangladesh. Yet, only about a third of the youth with tertiary education find employment within 1–2 years of graduation; around 69% of employers reported a shortage of skilled applicants for these positions in a recent survey (World Bank, 2019). This implies that higher education, in general, is unable to provide the right types of skills. Despite steady improvements, Bangladesh seriously lags in ensuring high productivity, transformative employment for its citizens. Among others, the quality, coverage, and relevance of education and training are critical reasons behind low labor productivity in Bangladesh. The high unemployment rate among people with higher education and the struggles facing employers in finding the right candidates indicate a clear mismatch between skills acquired and required.

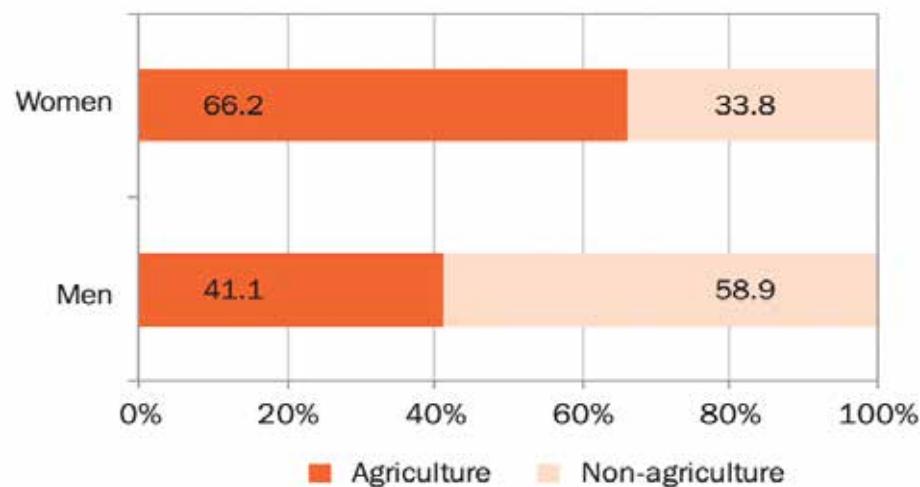
The most essential measure of quality in a school system is whether its students are learning the foundational skill for all future learning: reading. In Bangladesh most children are not acquiring basic reading fluency. At present, less than half the primary school graduates attain basic literacy and numeracy by the end of grade five which is alarming. While we must ensure a solid foundation in literacy and numeracy for all young people, we must pay special attention to building employable skills. Underprivileged groups, particularly women, must get special attention.

### 4.3.3. Female Labor Force Participation and Female Literacy

Women in Bangladesh are far behind men in higher education, training, employment, and earnings. While the root causes are perhaps the age-old gender norms, creating favorable conditions for women to get higher education and productive employment is a strong pull to break away from the social norms. Employment of women is important in developed economies, particularly for those facing a labor supply constraint. In developing economies, women play an important role by contributing to household income, adding to the supply of labor for economic activities, and above all by empowering women. Factors influencing demand for, and supply of female labor can be different from those relevant for males, and hence it is important to devote specific attention to gender differences in this respect.

The large proportions of the employed labor force remain in sectors and activities characterized by low productivity and returns. Although this has led to a high growth of female employment. The rapid growth of one export-oriented labor-intensive industry, viz., ready-made garments, is one of the major reasons that they offer a large proportion of jobs to women. Secondly, women's participation has also increased in poultry and livestock and a variety of rural non-farm activities, thanks mainly to the spread of microcredit. However, despite such growth, the rate of female labor force participation in Bangladesh (36% during 2006-10) has remained much lower than in countries of East Asia (67% in 2010) (Rahman and Islam, 2013).

*Figure 4.9: Employment by Sex and Economic Sector*



Source: 2010 LFS and ISS data, retrieved from ADB report: Informal sector and Informal Employment in Bangladesh

Data presented in Figure 4.9 also compliments the fact that there was acceleration in the growth of agriculture during the second half of the 1990s, the period of sharp increase in female labor force growth. And decline in the growth of agriculture in the early 2000s was associated with a

lower growth of the female labor force. Thus, the early rise in female labor force growth in Bangladesh appears to have been triggered by a rise in the growth of agriculture and increasing participation of women in that sector. While on the other hand, by creating jobs for women, the RMG industry is playing an important role in reducing poverty in rural areas because many of the women are migrants from poor rural households. One study finds that they are mostly from poor rural households in areas suffering from food shortage (Rahman and Islam, 2013).

Industries with higher numbers of female workers are facing the prospect of increased automation and the elimination of 40-60 percent of jobs over the next 20 years. Additionally, low-skilled workers face substantially more risk of job loss than those with secondary or tertiary schooling, again disadvantaging women. Economic shocks brought about by COVID-19 and climate change provide an additional layer of vulnerability for female workers, further highlighting the persistent intersectionality of gender and poverty.

Bangladesh is globally recognized for dramatically increasing access to educational opportunities, especially for girls and women, over the past few decades. However, the reality remains that most women are unable to complete post-primary education or make the school-to-work transition to good jobs. Although Bangladesh did well in access to primary education for girls, their enrollment in secondary and tertiary education remains low. Data from the 2017 Bangladesh Bureau of Educational Information and Statistics show that dropout rates for girls are at a high 42 percent at the secondary school level; completion rates are low, with grade 10 rates bottoming at only 10 percent, and secondary level completion rates reaching a mere 59 percent. Improved access to quality education and training for all is needed for Bangladesh to benefit from a possible demographic dividend. Women must enter the labor market and earn good incomes for the dividend to be reaped, and for that to be realized, among other factors, girls and women require a quality education. This means a better integration of the skills necessary to ensure employability in the future, including in the green economy, such as information and communications technology (ICT), problem solving, numeracy, and literacy skills in technology rich environments. Also critical are even deeper transformations to societal norms, such as increased commitment to educating girls and women, doubling down on efforts to ensure women's smooth school-to-work transitions to steady jobs, and women having the agency to safely work outside the home. Despite successes, more and better public investments for education are needed.

While access to advanced education for women needs to be improved, at the same time it is important to attract FDI to produce more productive service sector jobs in Bangladesh. Studies suggest a negative effect of education on female labor force participation (Rahman and Islam, 2013). This education paradox indicates the possibility of strong structural change having taken place in the labor market of Bangladesh, with low-paid informal sector jobs requiring no or a very low level of education becoming predominant for women. With the boom of ICT industries along with e-commerce industries in the past decade in Bangladesh, an increased focus on such

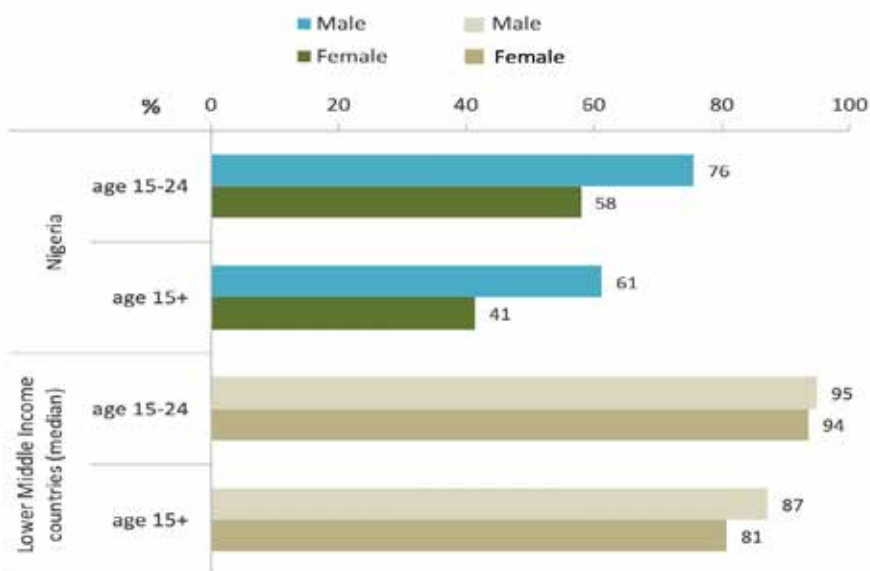
industries can prove to be game changers in bridging the gap between education and employment.

## 4.4. Nigeria

### 4.4.1. Education and Training

Even though education in Nigeria is free, one out of five of the world's out-of-school children are in Nigeria. The federal government ensures the access to basic education nationwide through four agencies of the Federal Ministry of Education (FME): The Universal Basic Education Commission (UBEC), National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC), National Commission for Nomadic Education (NCNE), and National Board for Technical Education (NBTE) (UNESCO, 2021). In Nigeria, the literacy rate is 66% among the youth population; this is lower than the average youth literacy rate in other lower middle-income countries (EPDC, 2018).

*Figure 4.10: Literacy rate among youth and adult population*



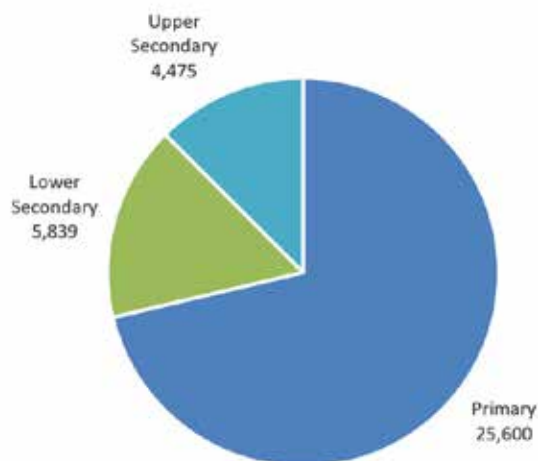
Source: UNESCO Institute for Statistics

Nigeria's education system is based on the 1-6-3-3-4 structure: one year pre-primary education, six years primary, three years junior secondary, three years senior secondary, and a minimum of four years tertiary education. Along with that, Early Childhood Care and Development (ECCD) in Nigeria comprises kindergarten (day-care), and three levels of nursery (preschool). This structure allows learners to systematically grow in learning as they transit towards primary education. While Sustainable Development Goal 4 (SDG4.1) targets only one year of pre-primary education,

the National Education Policy, early education constitutes a four-year structure (UNESCO, 2021). Among the students enrolled in pre-primary education, about 50% are girls and most of them are from rural areas. This suggests gender parity in early education. However, this doesn't remain constant throughout all the states, with Northern and North-western states having enrollment of boys disproportionately higher than girls. Internal insurgencies, armed conflicts and consequent dispossession undermines the participation of students, especially girls. Studies suggest that the primary net enrollment rate in conflicted areas is 76%, which is 15% less than the global average (UN Women, 2015). However, some of the northern states which have borne the brunt of conflicts for years display positive participation of girls in pre-primary and primary education, in some states almost equal to boys (UNESCO, 2021).

The official primary school entrance age is 6. The system is structured so that the primary school cycle lasts 6 years, lower secondary lasts 3 years, and upper secondary lasts 3 years. Of the total children enrolled in primary and secondary education in Nigeria, about (71%) are enrolled in primary education. The figure below shows the enrollment in different levels of education reached by youth ages 15-24 in Nigeria. Approximately 25% of youth have no formal education and 5% of youth have attained at most incomplete primary education, meaning that in total 30% of 15–24-year-olds have not completed primary education in Nigeria (EPDC, 2018).

*Figure 4.11: Number of students by school level in Nigeria*

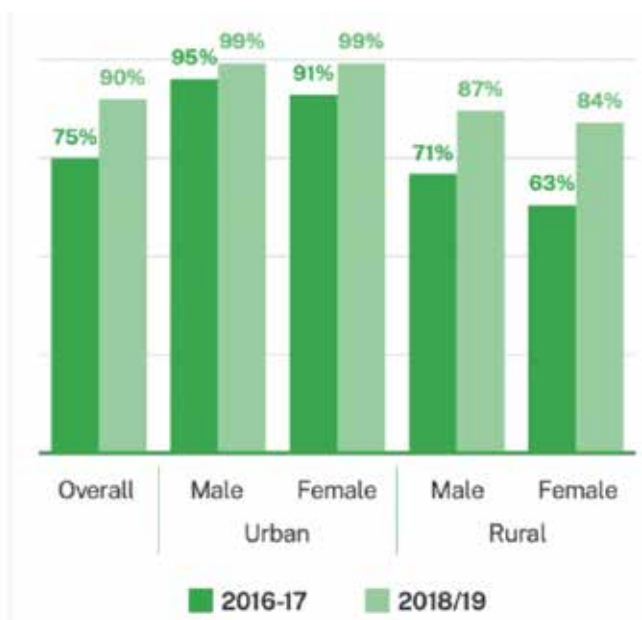


Source: UNESCO Institute for Statistics

There has been a significant improvement in primary school enrollments in Nigeria between 2016 and 2018, bolstering the aim of universal basic education (SDG4.1); 90% of the children are eligible for primary education attended primary school between 2018-2019 (UNESCO, 2021). Children attending urban schools represented 99% of the eligible population, with an even

spread between boys and girls. Although the capacity of primary schools increased, 3 in 10 eligible children are still not attending school.

*Figure 4.12: Evolution of gross attendance ratio in primary schools in Nigeria*



Source: MICS 2016/17 and Nigeria Living Standards Survey 2018/19, retrieved from National Education profile 2018, Nigeria.

It is estimated that 35 percent of Nigerian children who attend primary school do not go on to attend secondary school. Half of all Nigerian children did not attend secondary school in 2021 (UNICEF, 2022). Four in five children eligible for junior secondary are attending school, but more than 60% are not attending junior secondary. Estimates from the 2018/19 Nigeria Living Standards Survey show that the GAR in junior schools during the 2018/19 school year was 73% with a NAR of 38%, implying that 62% of eligible children were not attending junior school (EPDC, 2018). While two in three children eligible for senior secondary are attending school, one of whom is attending senior secondary school.

#### 4.4.2. Education, Economy, and Labor Force Participation

Nigeria has continued to record impressive economic performance during the last decade. Gross domestic product expanded 3.4% last year, after contracting 1.92% in 2020. The non-oil economy expanded by 4.73% in the quarter from a year earlier, with agriculture growing 3.58% and services increasing 5% (Al Jazeera, 2022). Nigeria has had a decade of jobless growth given that years of economic growth has not translated to more wage employment opportunities and poverty alleviation. With regards to employment, NEEDS-2 noted that the economy had experienced growth without commensurable increase in job opportunities (ILO, 2021). In the



fourth quarter of 2020, the unemployment rate in Nigeria reached 33.28 percent. Between 2015 and 2020, the unemployment rate grew. In particular, in 2017 the unemployment rate registered the fastest growth, increasing by about six percentage points during the year. However, this data was calculated according to the Nigerian methodology. Based on the most common international methodology, the unemployment rate in Nigeria stood at 17.5 percent (Sasu, 2022). Studies suggest that the unemployment rate is higher among the population with secondary and tertiary education.

Several factors account for the upsurge of graduate unemployment in Nigeria. The first factor is a system of governance that thrives in corruption. Further, whatever growth that takes place in Nigeria is not labor intensive and as such cannot generate an equal proportion of jobs for the unemployed graduates. The lack of synergy between the production of graduates and employment opportunities underscores the complexity of the problem. The upsurge of unemployment is attributable to corruption which impedes the nation's ability to invest in genuine development projects that can generate employment. The problem is compounded by the expansion of the university system, the general population explosion, and lack of entrepreneurship education (Anagun, and Michael, 2020). The Nigerian state should be able to use its huge resources in transforming the economy from its present state to a level that it can generate sustainable employment opportunities.

#### 4.4.3. Female Labor Force Participation and Female Literacy

While female labor force participation for females increased from 40% to 50%, for males it decreased from 61% to 51% over the last 20 years. This change is mostly due to the changing roles of females in the society as well as increase in the number of females who get education (Nagac and Nuhu, 2019). In the last decade, the female work force participation declined from 55% in 2011 to 49% in 2018. (World Bank)

Distinct differences exist in the types of occupations entered by women and men. Women got more jobs in administrative, clerical, personal services and sales occupations. Apart from moving into law, medicine and accountancy, there was no similar movement into science, engineering, Information Communication Technology (ICT) and the skilled trades (Iweagu, Helen, et al., 2015). Women were not found in managerial occupations: overall, women make up only 32% of managers and senior officials (Women and Work Commission, 2005). Equally, Okoro (1991) notes that apart from traditional humanist professions like nursing, teaching, catering and law, the percentage of women who venture into professions like engineering, architecture is low compared to men. In the same light Umar & Karofi (2007) observed that female employment in the Nigerian civil service historically tended to be lower than male.

Studies suggest that age, marital status, urban, primary school, middle school, high school variables significantly affect female labor force participation (Nagac and Nuhu, 2016). A study by Kadir Nagac and Hauwa Shuaibu Nuhu on Female labor force participation in Nigeria suggests that as the person gets one year older, the probability of being in the labor force increases by

1.2 %. This result is in line with the literature. Lisaniler and Bhatti (2005), Faridi et.al (2011), and Bibi and Afzal (2012) find that age has a positive effect on labor force participation. On average a female who lives in an urban area has 11% lower probability of being in the labor force compared to a female who lives in a rural area. This result seems counter-intuitive because there are more job opportunities in urban areas. However, in rural areas agriculture sector employment is more common and labor force participation calculation counts everyone who worked at some point in the last 6 months in the labor force (Nagac and Nuhu, 2016). Further, marital status significantly and positively affects labor force participation in rural areas but not in urban areas. Surprisingly, the study indicated that married women have a 23% higher probability of being in the labor force which counters the social norms in Nigeria. Educated females have a higher probability of being in the labor force than uneducated ones. Primary school, middle school and high school graduates are more likely to participate in the labor force compared to uneducated females.

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## 5. Household Consumption and Alternatives to Public Finance

*Astha Negi*

Consumption in most developed economies is the single largest contributor to GDP. Throughout the lifecycle of an individual, the consumption patterns change. With age changes, these patterns drive varying demand for goods and services. (Borrallo et al., 2021)

Determined by the utilities and welfare, consumption accounts for the decisions to spend and save (Attanasio. O, 1999). This saving is an essential component of the demand side development for national economies. The Golden Rule of capital accumulation, a neoclassical theorem, determines capital accumulation as a primary driver of consumption. This accumulation in the lifecycle of a worker can occur when there is the availability of sufficient financing investment opportunities.

*Figure 5.1: Households and NPISHs Final consumption expenditure (% of GDP) - Bangladesh, World, Japan, Nigeria*



Source: World Bank Data (2021)

In pensions and other accumulation, savings avenues generate investments by providing sufficient funds that larger cooperation can mobilize. These funds have in the past kept aging economies like Japan afloat, as this makes a larger pool of funds available for future infrastructure

needs. However, it is also important to note that the mobilization of these funds needs prioritization to avoid Japan-like mistakes, which we will discuss in the following subsections.

## 5.1. The Case of Japan

As a country with the oldest population, Japan has gone through a turmoil of economic changes and responsive fiscal reforms. The resulting experiences of Japan are now a reference for all future economies going through the same transition. Over the next three decades, the world will be experiencing rapid demographic change, with the proportion of the world's population over 60 years of age reaching 22%, nearly double the proportions today. (World Health Organisation, 2021) To prepare for this transition, most countries need to temper aging-related pressure on national economies. While public and private funding and investment plans contribute to the development and stabilization of national economies, public interventions are vital in expanding benefits and minimizing the adverse impacts of large-scale changes like aging. Hence, public financing and its health are critical parameters in the final performance of each country through this change.

Borrallo et al., (2021) discuss the two-fold pressure on public finances: increasing public spending and reducing tax revenue. The institutional regulators' decisions further complicate these dynamics of national economies and the public and private investors. Japan again serves as an excellent example to learn from here.

### 5.1.1. Aging and household consumption

The “Lost Decade” of Japan is studied by different researchers and speculated to be caused by many factors. One such speculation of the bubble economy and its eventual decline has been asset inflation caused by the inefficient use of the fixed private investments of the aging population. (Onaran, Yalman, 2011; Horioka, 2006)

Between the years 1980-1990, Japan experienced a growth in national GDP. This growth resulted from a bubble economy that started around this time and burst around 1990 when the asset prices and equity fell. This burst resulted from the Bank of Japan's intervention to prevent inflation in the real-estate market through interbank loans that left a lot of Japanese banks and insurance companies in bad debt. The recession Japan experienced made Japanese companies cautious and chose to save thereafter than borrow mainly (Onaran, Yalman, 2011). This decision snowballed further as a misstep of Japanese private firms that expended the available investment. Because they became highly reliant on traditional bank loans from supporting banking networks, they chose bank-to-bank loans instead of investments through capital markets to bail them out of debts. These decisions by private agencies inflated the bubble economy further to exuberant proportions. Conclusively, this chain quickly collapsed when the Bank of Japan began increasing its bank-to-bank loan interest rate in 1990. Over the next few years, GDP resulted in an almost 60% decline in its peak rates (Krugman, 2009).

Consumption or demand researchers like Yuji Horioka, in *The causes of Japan's 'lost decade': The role of household consumption*, theorize the grounds of the Lost Decade by the stagnation of private investment in the 1990s. For household consumption, Horioka has listed consumer goods such as clothing, footwear, transport, and to a lesser extent, education, food, and non-alcoholic beverages as household purchases. When the Japanese GDP started declining, household consumption, government consumption, and net exports kept the GDP afloat. The household consumption in this equation thus, as Horioka observes, did not drag the economy but prevented it from stagnating further. Another important observation in this condition is that the stagnation of household consumption resulted from stagnant disposable income and not from the uncertainty about the future.

The takeaway from the Japanese experience is that, under strained conditions, fiscal stimulus and temporary and targeted tax breaks can provide crucial leverage for revitalizing national economies. (Horioka, 2006) When analyzing aging in terms of its burden, we should also look at diversifying the revenue and funding options in economic transition through financing alternatives.

## 5.2. Investment focus in Bangladesh and Nigeria

With increasing age worldwide, the burden on financing the global demographic change is rising. Japan's case is good precedence that showed us the need to mitigate countries' aging-related challenges. When faced with the demographic transition, demographic change is usually accompanied by a change in economic growth, macroeconomic integrity, and the labour market.

As is established in the country section of this report, Bangladesh and Nigeria are both at the early stages of their physical and financial infrastructure development. Such composition of these nations introduces barriers to absorb the burden of the changing demographics and, by extension, a decrease in the national economic and fiscal production. (Berganza et al., 2020; Badarinza, et al, 2019; ABD, 2019; OECD, 2017) The current section will discuss the higher volatility these countries experience and the need for early preventive measures that accommodate these transition-related changes.

### 5.2.1. Pension and Healthcare

As funding options converge, of many avenues available to fund this change, public financing becomes crucial for most emerging economies. (Berganza et al., 2020) Both Bangladesh and Nigeria are young developing economies with relatively new financial infrastructure. This infrastructure with aging is prone to experience a larger share of risks associated with older demography. (Badarinza et al., 2019) These challenges can become more extensive and multi-layered if not prepared for, aggravating the conditions with time. To plan for such risks, we need to acknowledge that aging will bring sectoral change in the user share of consumption patterns for each cased country and developing economies.

The gradual changes in an individual's income, savings, and consumption patterns generate a dynamic imbalance in the funding avenues for public capital. Pension and healthcare, historically, are two sectors that have grown in their demand as the societies age (Borrallo et al., 2021; OECD, 2019; Hernández de Cos et al., 2017). These sectors have in the past become the most contested and induce a greater demand for government spending. (Borrallo et al., 2021).

When examining the pension and healthcare sectors in Bangladesh and Nigeria, we find a dearth in these sectors' available options and infrastructure. Pension schemes in Bangladesh and Nigeria lack both comprehensive benefits and coverage for most households. Healthcare in these countries shows similar trends with a paucity of adequate healthcare provision. These services like pensions are also lacking in performance and coverage. Here we find high levels of private out-of-pocket spending in developing countries instead of publicly-funded care. (World Bank Conference, 2013) For the defined scope of this section, we have limited further discussion on these trends, which we have examined more gradually in the Pension and Healthcare chapters.

### 5.2.2. Developing economy and associated risks

When planning for an aging society, it is essential to note that while many of the cases from Japan's experience provide us with meaningful insights, not all of the learnings are directly transferable. This observation is especially true for the developing economies, which share a higher proportion of risks than their developed counterparts.

As is investigated by Badarinza et al., the emerging economies have a large pool of first-time financial market users who are young households within these regions. (Badarinza et al., 2019). Because such encounters can have long-term economic-behavioural impacts, this concurrence is statistically defining and need careful management (Anagol, Balasubramaniam & Ramadorai 2018b; Malmendier & Nagel 2011). An overarching difference in the consumption and savings patterns across developing economies has been the household participation rates in capital accumulation, the financial debt trends, and the savings in the developing economies. Badarinza et al. and the OECD report elaborate on these trends further below. (Badarinza et al., 2019; OECD, 2019)

*Assets Participation rates:* The financial participation of households in using financial instruments in developing economies is higher for durable goods and real estate than in developed economies. These trends show an accumulation of financing participation rates in physical assets, which have perceivably simpler transaction systems. These modes are preferred in the developing economies, maybe due to higher transaction costs like nonpecuniary transaction costs such as lack of trust in financial instruments and evidence attached to the risks associated with non-physical assets such as bonds, bank savings, etc. The participation rates in financial non-



physical assets are 60% in developing economies, out of which only 10% or fewer households participate in the equity market or have banks. This variable is as high as 90% for developed economies.

*Debt Participation rates:* The financial debt in economically developing countries is funded mainly by informal borrowing. This is true even in high real-estate assets holding developing economies, conducive to mortgaging. As high as 40% of households in emerging economies lack emergency funds because of their borrowing. These trends could be worrying because these households may be borrowing at higher interest rates, which can put an undue burden on such families already straining to meet their needs.

*Savings:* In developing economies, savings by lower elderly households characterize liquid assets and higher mortgage debt than the younger generation. These trends attribute to the cultural structuring of families in these regions where the elderly own a house with multiple generations living under the same roof. These structures can, at times, be the only safety net of saving flow available to these households. The pecuniary and nonpecuniary transaction costs additionally burden the saving functions with limited accessibility to the bank branch or lack of trust in the institutional systems. Under these circumstances, the savings can exist not at financial institutions but as cash holdings, livestock, or savings club investments. (DemirgüçKunt, Klapper & Singer 2018; Dupas, Keats & Robinson 2017; Flory 2018; Karlan, Ratan & Zinman 2014). In the long run, such a saving structure can burden the aging households if they run out of their smaller, unplanning savings. These savings do not support the larger investment pool of the national economy.

The Assets, Debt, and Savings challenges discussed above determine the heterogeneous trajectory of old-age consumption in developing economies. Such diverse sets of financial patterns then raise the risks of the economic downfall of households in such economies. When planning for the future of aging consumption, our evaluation indicates the need for careful calculation of the parameters that play an active role in these financing decisions.

Substantial use of technology has been made to mitigate the above challenges and make asset, debt, or saving planning more accessible. Banking and investment mobile applications have been a great way to connect investors with suitable schemes and supply them when needed. (UNIDO, 2018)

Implementation and active investment for nudges to save more is another area of work that has seen a change in the way people interact with these services. These nudges have also proved effective in getting people to save more by providing saving choices and inertia. Such nudges are required, especially in developing economies where people have limited access to primary financing-related advice.



Financial education lastly, even though it is not determined as a statistically significant variable, can be one of those things that are taught more actively through formal education. This learning can help the people as young adults be more attuned to and comfortable with making financing decisions, which can be the basis of making longer-term sound economic decisions. (Badarinza et al., 2019; OECD, 2019)

### 5.3. Financing Strategies for Bangladesh and Nigeria

The boon of the 20th century has been an increase in global life expectancy facilitated by huge strides made in the healthcare sector, adding years to individual ages. These remarkable developments have been accompanied by higher education levels and lower fertility rates that have collectively aggregated to new challenges of aging economies around the globe. (ABD, 2019; ABD, 2011; OECD 2019)

As discussed earlier, a change in national demographics is reflected in the consumption patterns of the given region. These consumption patterns are characterized by the need to encourage capital accumulation and domestic investment to help increase productivity and fiscal balance through saving, investment, labour supply, and welfare systems. Reforms in old age social security such as pensions and healthcare are also additional investment areas that require mitigative strategies in the near future. (ABD, 2019; OECD, 2019; World Bank, 2020)

#### 5.3.1. Household Consumption Factors

To meet the needs discussed above, countries employ public funding that results in per capita life cycle deficits. In our case example of Japan, these deficits are high for dependent populations such as children and the elderly. These deficits instruct the national priority on education and elderly benefits and care. Nigeria, on the other hand, with the youngest population and large young deficit, experiences a smaller old deficit, both of which are comparatively lower than that of Japan. Similar trends are observed in Bangladesh, where the young deficits are high but lower than in Nigeria, and the old deficits are identical to that of Nigeria. These trends represent relatively low education spending and negligible formal retirement options. (ABD, 2019)

The general trends in aging suggest an increase in consumption expenditure and a decrease in saving and investment opportunities. However, at a granular level, some research indicates a reduction in consumption upon retirement with the relative change in goods and services demand (Borrallo et al., 2021; ABD, 2019; Jappeli and Pistaferri, 2010). These changes are characterized by an increased household consumption of some non-durable goods and services, like food and healthcare, which are tax-exempt or have lower taxes. (United Nations, 2009; Credit Suisse, 2015; Eurostat, 20) With limited savings to spend, the demographic changes can also increase the demand for lower-priced goods and services, which can generate downward pressure on the inflation rate (Aguiar and Hurst, 2013; Luengo-Prado and Sevilla, 2013; Broniatowska, 2019). Concurrently, as was seen in the case of Japan, with changes in the demand

for goods and services and limited labour supply- these changes also impact the sectoral composition of the labour force. This has, in the Japanese case, led to job polarisation towards automation, which also affects tax revenues of aging economies (Sebastian, 2018; Blix, 2017)

Further examining these household-level trends, an ABD report observes that the aging in a region does not substantially contribute to the domestic demand and consumption in the early stages of this demographic change. These trends mean there is a higher need to mitigate the challenges for elderly households. (ABD, 2011; ABD, 2019) This observation is especially true and more relevant to the lower-income economies like Nigeria and Bangladesh, where the risks involved in this equation are higher.

As individuals age, there is less certainty in their saving flows resulting from inadequate or absent pension plans. This observation thus leads to a suggestion which the report makes- to invest more public funds in health care and pensions. This intervention would reduce the burden of an uncertain future and promote active consumption and spending of the older population.

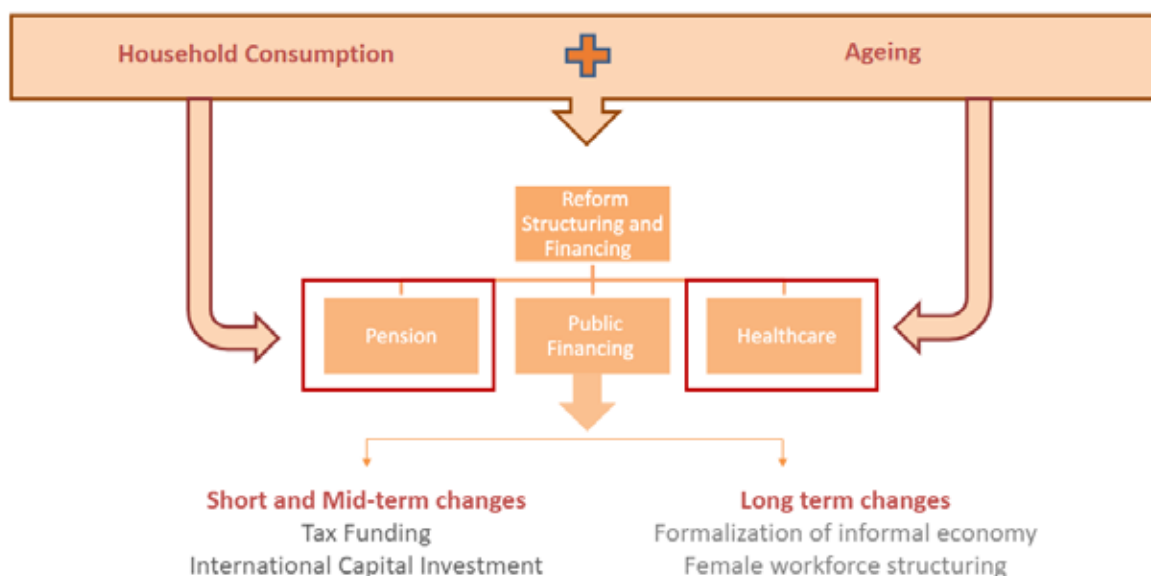
### 5.3.2. Public Funding Avenues

Aging worldwide has put economies in a precarious position where aging-related expenditure pressures need to be alleviated for the countries to stabilize their economies. These pressures are exponential for Bangladesh and Nigeria, where the risks associated with economic changes is higher than their counterparts in the developed world. As described in the above section, there is a need to increase public financing in the countries that are slowly aging. As an OECD report suggests, these reforms need to happen sooner than later as the current circumstances of these economies may overburden the fiscal stability of these nations.

The sectors which need immediate reforms in aging countries are pension, health, and long-term care expenditures. This delay can put the households at an increased risk of substantial tax increases. The failure to offset these costs additionally can cut essential public spending or, more concerningly, add to the national debt of the growing economies. (OECD 2019)

There is thus a need to diversify the pool of public funding avenues to support this change in the demographics. This diversification can happen through restructuring and reforming the public financing through short and long-term changes in individual countries. The context of such reforms is key in producing the most relevant solutions for each economy.

Figure 5.2: Household consumption and Public Financing Avenues for Aging



Source: Self-produced chart based on OECD recommendations and sectoral composition

As charted above, the section below enlists some strategies recommended by the OECD report 'Fiscal challenges and Inclusive Growth in Aging Societies,' based on the analysis of the aging OECD population. Based on the risks associated with developing economies like Bangladesh and Nigeria, these strategies specifically target the key challenges of such countries like the informal economy, reducing fertility rates and female work participation, a large pool of current young population, and weak pension and health sector.

### *Long term*

*Formalization of the informal economy:* The participation of informal economy workers is high in both Nigeria and Bangladesh. (Khan Mamun et al,2020; Md Reza et al, 2018; Etim & Daramola, 2020) While essential in providing jobs, this economic function can be detrimental to the longer-term national economy as their production is not accounted for through taxation. With aging, the existing pool of workers contributing to the public finances is expected to shrink, causing a possible increase in the inflation rates. Because of the extensive coverage of the informal work in Bangladesh and Nigeria, their participation needs to be improved to minimize the risks and burden associated with aging in economies. This informality can be addressed by

- Avoiding high labour tax on low-paid workers to incentivize their participation in the formal economy.
- Simplifying the worker registration, targeted audits, and indirect methods of tax liability assertion methods.

*Female workforce restructuring:* With lowering fertility rates in both Bangladesh and Nigeria and more extensive participation of female workers in the economy, there is a pressing need to accommodate such demographic changes in the work landscape. The needs of future families necessitate accommodation to build back younger, productive economies. Child-related financial support also impacts family size and structure, and childcare-related tax subsidy policies for female workers, therefore, can help support the growth of families in aging economies. Women, moreover, are historically seen to be more at risk of old-age poverty. It is then vital to carefully plan policies to encourage female workers so that the nations benefit from increasing both female labour supply and fertility.

### *Short term*

Because long-term changes like formalizing the informal economy and workforce restructuring can be an ongoing process requiring extensive planning, we would in this report emphasize short-term strategies as a place to start for developing economies. Unlike the longer-term intervention, these strategies can produce quicker results in shaping national economies. These recommendations are particularly useful for developing economies with an urgent need to plan and manage aging and its impacts early on.

### *Tax Funding*

Direct and indirect taxing are good ways to offset any expenditure on a national scale. When analyzing direct labour tax options, one needs to look at the population of the current workers in respective countries. While Bangladesh, in its formal economy, has managed to utilize its labour force, Nigeria continues to struggle to put its human resource to work. Such inadequacies in the labour force formation burden the existing direct labour tax funds. Because the labour tax already accounts for a significant household burden, raising them would not only increase the labour rates but also discourage formal labour participation in developing countries. Additionally, raising such taxes can prove harmful to the national economy as this would inflict an unreasonable tax burden on the working population.

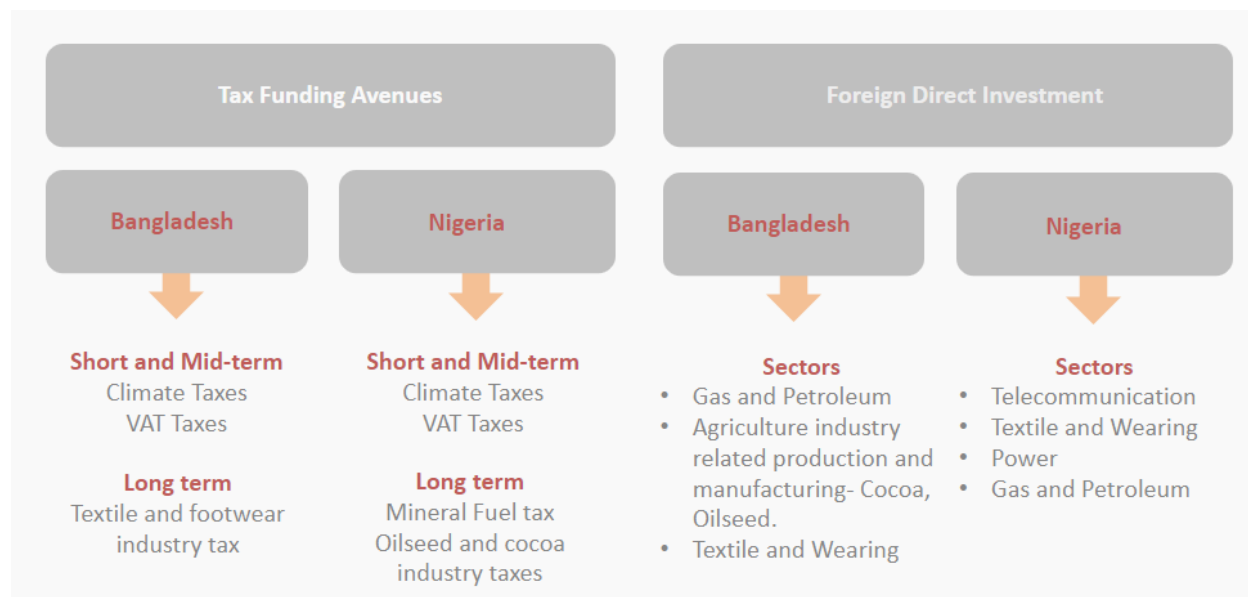
A solution to this problem then, like in the case of Japan, is to look at indirect consumption taxes that equally distributes the burden of financing the national economy among the young and the old.

*VAT taxes:* These can be indirect taxes that are less distortive, like VAT on goods and services which are non-essential. Such taxes can be the VAT on hotels and restaurants, the lower value of which currently benefits the high-income earners. (OECD, 2019; OECD, 2018)

*Climate / Carbon taxes:* Another effective strategy to increase tax funding can be to use taxation to improve public use while raising enough tax revenues. An example of such taxes can be climate and environmental taxes, coming from the transportation, energy, and construction sectors. (OECD, 2019)

*Inheritance taxes:* Lastly, because a large portion of the developing economies run on real estate assets and savings, countries can also generate substantial revenues from inheritance taxes on these properties. (OECD, 2019; Badarinza et al., 2019)

Figure 5.3: Alternative avenues for financing aging in Bangladesh and Nigeria



Source: Self-produced chart based on OECD recommendations and sectoral composition

### Foreign Direct Investment

With consumption becoming more global than ever today, Foreign Direct Investment (FDI) flows have become popular growth tools in developed economies. These funds flow from developed economies to developing ones aiding domestic production, human capital, and infrastructure development. (Md Reza, 2017)

Both Nigeria and Bangladesh are currently in a trade deficit with a lower rate of investment and capital. (Khan Mamun et al,2020; Md Reza et al, 2018; Etim & Daramola, 2020) FDI, in most cases, decrease this trade gap and influences the tax revenues, government expenditure, and exchange rates. (Md Reza, 2017) As developing economies, both Nigeria and Bangladesh are in a good place to create unavailable infrastructure and skills needed in the region through FDI financing. It is important to note here that excessive dependency on FDI can make a region more vulnerable to changes in the international market. It is, therefore, necessary to manage the FDI investments not to boost domestic demand but to use the investment to improve domestic savings and human capital development. (McKinsey, 2018)

Both Bangladesh and Nigeria have already been active users of FDI. Because Bangladesh has a large number of emerging market economies (EMEs), so the region is appropriate for investment in Ready Made Garments (RMG), Textile, Leather, Pharmaceuticals, Information, and Communication Technology (ICT), Marine, Tourism, and Agro-based Industries. (Md Reza, 2017). Figure 3 elaborates on the most pertinent sectors appropriate for FDI in Nigeria and Bangladesh cases. The chart contains the list of probable sectors instead of those already sharing a percentage of FDI.

## 5.4. Conclusion

The current consumption section opens up a discussion on the public funding options to help mitigate the aging challenges in developing economies. Our current review of the Japanese case and its comparative study through Bangladesh and Nigeria has helped us establish some commonalities between the developing and developed nations. Conclusively, with a large population to cater to and a complex financial and cultural structure, we have discovered in our research that developing economies face higher risks and burdens from an aging population. Because these risks can be formative for countries like Bangladesh and Nigeria, such risks need to be addressed early on in the economic life cycle of each of these countries. These countries need to actively invest in age-related priority sectors like pensions and healthcare. Developing economies can generate such investments through short-term reforms in tax generation and foreign direct investment opportunities.

The revenue generated from the above-suggested methods needs to be utilized in the country's long-term economic growth. For Bangladesh, this means investing more in priority areas like building financial infrastructure for formal pension and health care, and for Nigeria, this means additional education and labour force skilling investment.

Our research concludes three areas of active investment for these nations, which are to

- Mitigate Financial Volatility
  - The GDP share moves away from household income to public financing options like Tax and FDI investment.
- Stabilize future priority sectors
  - Prioritize stabilizing the health and pension sectors.
- Accommodate Demographic Change
  - Increase investment challenges on female employment and healthcare.

We observed that even though most of Japan's learning was transferable, contextuality is key for developing economies. Any reform in public financing structure is an incremental process that needs to be given the time and space to evolve. This evolution for the developing economies means a shift in national priorities for economic growth. Hence, the national governments need to promote policies that strengthen domestic demand and services related to aging. Such policies

need to persistently encourage savings more actively, invest in priority sectors more efficiently, and build their labour forces more effectively.

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## 6. How to Fund Pension Systems

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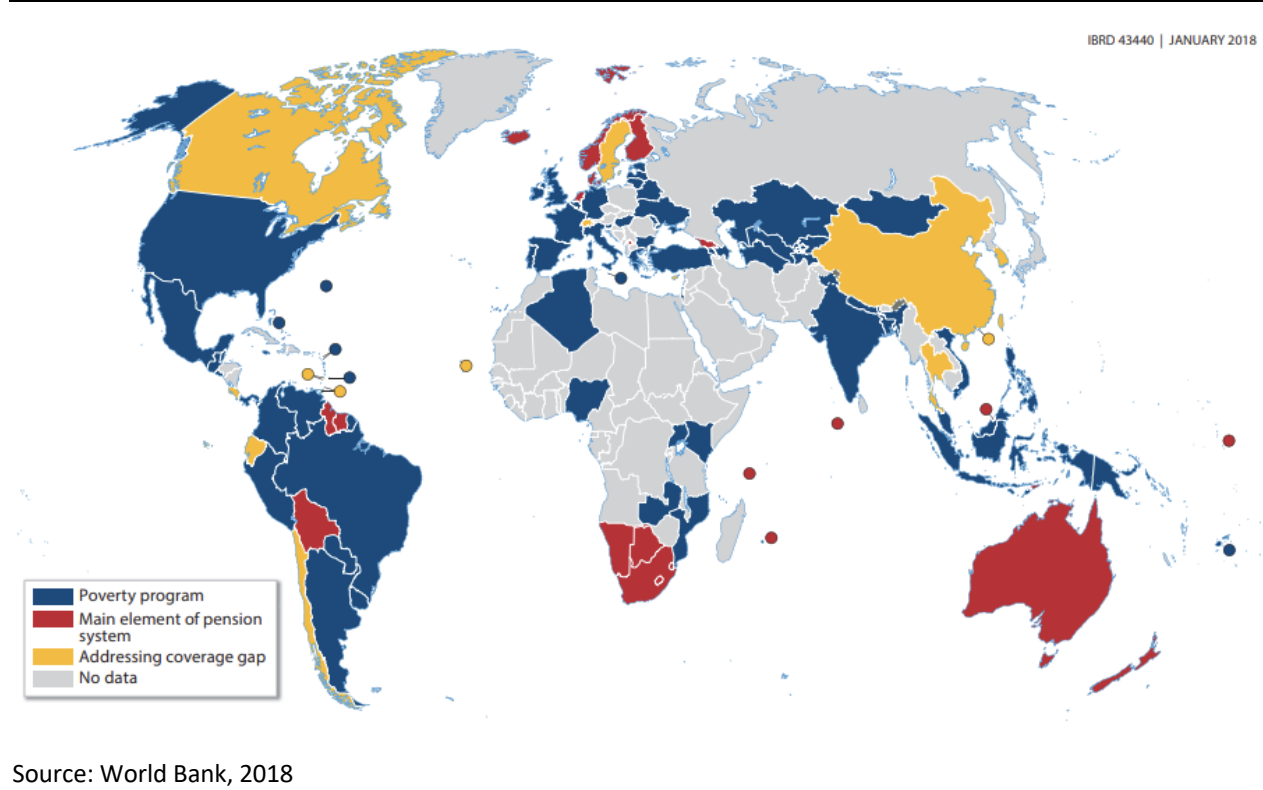
*Dillan Patel*

Many economies, mainly in the developed world, are aging and will have to find ways to provide adequate pensions to their elderly population while experiencing a declining working-age population. Many of them already face underfunded pension systems for current workers. On the flip side, many developing countries with a youth bulge will need to increase productivity to raise incomes so that young people have enough disposable income to save for the future (discussed earlier in Chapter 3). Policymakers will have to decide *who* will pay for pensions, *who* are eligible for pensions, *how* payments are allocated *when* people will be eligible for pensions, and *how* funding is acquired.

Pensions provide the elderly with income after they retire. They are framed in different ways depending on the country or culture. They are something to look forward to after decades of work and tax contributions (an ‘entitlement’) and a sign of respect a country gives to its aged population. Or they may be framed as a tool to promote intergenerational or economic equity. Pensions provide a vital safety net for people who have no other means of support like family (i.e., a kind of ‘insurance’ such as in Japan). Pensions are one of several social security systems targeted at the elderly that work in tandem with each other. These include long-term care, healthcare, and energy assistance. Thus, governments may see pensions as a means of reducing elderly poverty. Figure 6.1 shows how public pensions are used around the world.

Pensions tend to fall under two categories: defined benefit and defined contribution. Defined benefit (DB) pensions provide a fixed income for retirees, sometimes indexed to inflation. Pension management (and hence investment risk) is usually vested in the government or employer. Governments may also provide DB pensions to a broad population, not just public sector employees. Longevity risk – the risk of continuing to pay pensions as life expectancies increase – is also allocated to the government. These are commonly referred to as social pensions. Governments have different rules for eligibility for the social pension, such as income or years of tax contributions. In many countries, social pensions reduce poverty among the poorest people. The map below shows the purpose of social pensions in different countries: as a tool for poverty reduction, to complement other pension plans, or to fill a gap in the system where other pension plans do not cover the entire population.

Figure 6.1: Map of social pensions and their purpose



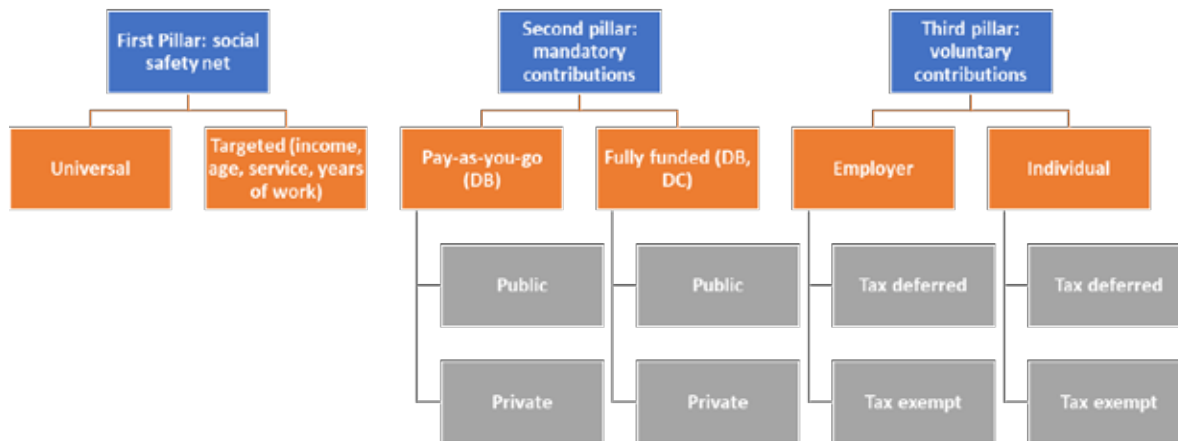
Source: World Bank, 2018

Defined contribution (DC) plans are based on how much money a person (and likely their employer) have contributed over their working life, either as a percentage of income or a fixed amount. The individual has responsibility for managing the pension during their working life and is responsible for appropriate withdrawals. Accumulated retirement savings are then converted to an annuity.

Defined contribution (DC) plans have become more popular because they involve lower liabilities for governments and employers. The shift to DC plans also parallels the greater fluidity of the job market because people are less likely to work for the same employer for a long time than they were in the previous century. DC plans are also viable for freelancers and gig economy workers.

Pensions generally have three tiers, or pillars, such that there is always a minimum level of assistance for any older adult in a country. The first pillar is a non-contributory social pension. This pillar can either be universal or targeted to people with few assets. Sometimes the social pension may require a minimum number of years of work. The second pillar is a contributory pension made with a public or private employer. The second pillar forces those with discretionary income to save for their retirement and rely less on the first pillar. It aims to replace the income that was earned during work closely. The third pillar is a voluntary private pension scheme. These pensions are elaborated in the following schematic.

Figure 6.2: Design of a 'pillared' pension system



Source: Adapted from Asian Development Bank, 2019

The following sections will explore:

- How to fund DB and DC pensions: private investment and public taxation
- How private and national pension funds can contribute to economic growth
- Gender, intergenerational, and income equity
- General options for reform
- Pensions in Japan: structure, adequacy, potential reform
- Pensions in Bangladesh: structure, coverage, potential reform
- Pensions in Nigeria: structure, coverage, potential reform

The beginning sections will discuss general mechanisms without focusing on a specific country and draw upon examples that may be replicable to other countries.

## 6.1. Paying for pensions

The distribution of the funding burden for pensions varies by country. It depends on the country's political economy (such as its political system, the strength of labor, and economic complexity) and dominant ideology (i.e., whether there is a greater emphasis on personal responsibility or social welfare). The subsections below explore public and private approaches to pension funding. The subsections take lessons from global experience before a deep dive into the pension systems in Japan, Bangladesh, and Nigeria in subsequent sections.

### 6.1.1. Private savings and investment

Pensions are savings and, therefore, deferred consumption – either from individuals, companies, or governments. When individuals save for retirement, they reduce the amount of income on consumption. Pension plans also 'lock in' savings because they restrict access to one's money

until retirement. Governments impose tax penalties on early withdrawals. Therefore, pension plans are a commitment and require people beyond short-term consumption needs.

Companies may be reluctant to match employee contributions because it reduces their profits. However, some companies may offer generous matching contributions to lure in and retain skilled workers in economies enjoying low unemployment. Firms (from micro-enterprises to multinationals) may hesitate to provide pension benefits to their employees in developing economies. Governments can also offer tax incentives for enterprises and individuals to contribute to an individual retirement account. Governments may also impose mandatory contribution matches. Organized labor within large firms can push for more generous retirement benefits.

Interest accruing on pension plans is the most critical factor in determining an adequate retirement package. The interest rate must be high enough to overcome individuals' discount rates – that is, it has to incentivize people to save rather than consume. Continuous contributions over a 40-year working life with a good real interest rate (about 7-10% net of inflation) result in a massive pension pot. However, a proper balance between risk and reward should be maintained. Private pension funds typically provide a diversified portfolio for their clients – usually a dynamic mixture of equities, bonds, and commodities – to satisfy clients' return expectations. Individuals may also save for other assets as well, such as property.

However, people do not tend to work constantly during their working life, much less for the same company. The average tenure among employees in the OECD in 2019 was just about 9.5 years, though up half a year from a decade ago (OECD, 2022). People often take career breaks after having children, to pursue more education, or just for leisure. Pension transferability (especially between public and private employers) can be burdensome. People who take voluntary career breaks, such as students and parents, or involuntary leave their jobs, may not benefit from DC plans.

The above can only apply to people with discretionary income. Most of the world's poor elderly population are in developing countries. By 2050, 80% of all older adults will be in developing countries. Only one-third of those have any access to retirement income (World Bank, 2016). Workers may prefer to save for other reasons, such as education, emergencies, leaving an inheritance, or purchasing an asset.

In countries with a large informal sector too low to save, small-scale schemes have offered a way for workers to save for retirement, such as in Nigeria, Kenya, and several countries in Latin America. These schemes tend to be flexible and straightforward. They allow for irregular payments to account for the heterogeneity of the informal sector (e.g., agricultural workers will only have savable income after harvest, while day laborers or market stall workers may make more frequent deposits). Accounts allow for early, yet limited, withdrawals if workers meet current expenses or short-term shocks. Having savings accounts split into a long-term pension fund, and a short-term savings account also helps build trust among informal workers toward

financial institutions. They, rightly, would not want to part with what little income they have if they lose it in the future (Güven, 2019). Different countries have experimented with regulation, technology, and awareness-raising to increase the take-up of these products. In several countries with informal sector pensions, accounts are tied to one's national ID number. Mobile money has made it easier for casual workers to access new financial products. In Mexico, convenience stores can receive deposits which are then relayed to pension fund administrators. Awareness-raising can occur through radio, pamphlets, or trade associations.

### 6.1.2. Taxation for public pensions

Governments tend to provide pensions to low-income older adults who have few assets. These DB pensions are intended to provide a minimum safety net for people who have few sources of support. Many governments also offer pensions to public sector workers such as teachers, civil servants, military personnel, etc. In the past, public sector employees' pensions mainly were unfunded DB/pay-as-you-go (PAYG) systems. Still, many governments in developed countries have shifted to fully-funded DC pensions over time because of fiscal constraints.

Governments can provide tax incentives to encourage people to save. This can include making contributions tax-deferred, which reduces people's taxable income by taxing their future pension. Conversely, governments can guarantee that pension withdrawals will not be taxed, incentivizing people to maximize their pension growth. In many developed countries, however, tax credits have considerably reduced government revenue (Asian Development Bank, 2019). When tax incentives are structured as deductions, they tend to favor the rich because it reduces taxable income.

Universal or public sector DB pensions tend to be indexed to inflation so that older adults are assured constant real income. Some countries may choose to index according to real wage growth, or have a minimum percentage growth in pension payments, or use a formula to combine the three. Indexing implies higher fiscal outlays, although higher income tax receipts from inflation or wage growth may compensate. Generous indexation mechanisms may reflect the importance of the elderly as a voting bloc: governments may often provide real increases in pension payments to get more votes, often at the expense of other spending.

Despite the move toward DC plans, governments and company pension funds in developed countries still have massive unfunded pension liabilities for their national pension program or public worker scheme. Unfunded pension liabilities are obligations to pay pensions without funds set aside. The present value of these liabilities is greater than the present value of pension fund assets. Reasons include fiscal austerity, lower than expected investment growth, or lower profits because of global competition. Thus governments – national, state, and local – will have to increase contribution rates (either general taxes or national insurance/social security), decrease benefits, or strive for greater returns on their investments.

PAYG systems also create inter-generational equity issues since current workers fund payouts to current retirees. Thus, if the demographic structure of an economy is tilted toward the older population, then workers have to pay more taxes. Governments rely on a large workforce to contribute taxes to fund pension liabilities. At the same time, the demand for government expenditure increases because an elderly population requires greater spending on public health (Asian Development Bank, 2019). Governments can work around this dilemma by increasing the productivity of their workers so that even with fewer workers, their higher incomes will provide more taxes. Such is the case in Japan.

Increasing productivity is a long-term approach. Short-term policy reform where fiscal pressures are acute. Governments may have to reduce pension payouts, means-test pensions, introduce tax penalties for early retirement, raise the retirement age, or increase taxes. Raising the retirement age and increasing the required years of contributions work in tandem to increase labor force participation among the elderly, assuming that they are in good health. Governments may also have to allocate spending away from other needs. These latter alternatives are politically unpopular and raise questions of intergenerational inequity because the young look forward to longer working lives and potentially less generous pensions while having more debt. Raising the retirement age raises income equity concerns because poorer people, including those working in manual labor such as agriculture or industry, tend to have shorter lives and are more likely to have a shorter retirement. Any change in government policy will impose costs on certain sections of society.

In addition, the tax system must consider the total assets of each retiree. Many older adults are asset rich but cash poor – often amassing considerable wealth from property and stocks but with few liquid assets. Older adults may hold on to this wealth to pass on to their children. They may also keep wealth as a precaution and reduce consumption more than necessary to continue building savings. They may want to safeguard against uncertainty over how long they will live or whether they will have to use savings to pay for long-term care or unexpected medical bills.

Less controversial measures include financial education to increase awareness of saving for retirement (and marketing any tax incentives). Automatic enrolment also overcomes people's procrastination or unwillingness to deal with bureaucracy (Asian Development Bank, 2019).

Notwithstanding greater fiscal austerity around the world, there has been a growth in the number of countries adopting social pensions available to the entire elderly population. As of 2012, about 80 countries are offering social pensions, half of which were introduced since 1990. Most of these later adopters are developing countries benefitting from their demographic dividend: they have an ample supply of workers whose tax contributions (even if indirectly through sales taxes) can fund pensions for a relatively small set of older adults. As Figure 6.1 shows, many emerging markets have adopted social safety nets for older people as an anti-poverty measure.

The primary constraint for developing countries is that they tend to have high levels of informal employment. Informal jobs do not pay as many taxes, which limits fiscal policy. They may also need to design policies to encourage women to join the formal labor force and ensure gender parity in pay. As mentioned earlier, however, innovative pension systems can be adapted for informal and independent workers. Moreover, developing countries tend to have a low proportion of elderly people, meaning that a universal pension would not cost that much. Expanding coverage through either or both mechanisms is helpful in the short term, but formalization in the long term will be necessary to create a more comprehensive pension system.

Even in advanced economies, the share of informal work is relatively high, at 10% in France and 20% in the USA (Asian Development Bank, 2019). The rise of the gig economy and freelance work results in uneven income. A large percentage of people in developed economies work part-time and are usually ineligible for company benefits.

Some governments, such as Japan and South Korea, have created national pension funds to invest pooled savings and achieve a long-term financial return. These pension funds allow greater resiliency against an aging population because they generate more money than could be achieved just through taxes and thus safeguards against the declining working population. Pensions funds have the double benefit of providing a source of finance for infrastructure investment, thus increasing economic productivity.

### 6.1.3. How pension funds can contribute to economic growth

Increasing domestic savings in developing countries offers a chance for that money to be directed to infrastructure investment. Many developing countries have public pension reserve funds or social security reserve funds. They can invest in infrastructure bonds, corporate or government bonds earmarked for infrastructure, project loans, equity, or infrastructure trusts. In a review of pension fund investment in Central Europe, Kolodziev et al. found a positive logarithmic correlation between pension assets and both GDP and gross fixed capital formation (Kolodziev et al., 2021). South Africa and countries in South America have used national pension funds to control finance toward renewable energy and toll concessions (World Bank, 2016).<sup>8</sup> These investments increase the economy's productive capacity and increase tax revenue. They also provide a better return for these pension funds than government bonds, thus increasing the financial resiliency of government-funded pension systems. However, many pension funds in emerging markets are still small relative to the GDP of their respective country. These countries will need long-term political and market stability to build sufficient assets. Moreover, strong governance is required to make investment decisions based on risk-adjusted cost-benefit analysis rather than political influence.

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<sup>8</sup> It is worth noting that pension funds do not appear to stimulate economic growth or investment in South Africa (Sanusi & Kapingura, 2021).

Some pension funds, especially in developed countries and some U.S. states, are taking an activist approach to investment to align the private interest in maximizing profits with the public interest of maximizing welfare. They have set environmental, social, and governance (ESG) goals that direct investment to specific sectors such as renewable energy and divest away from socially or environmentally harmful sectors, such as fossil fuels or tobacco. Investment decisions extend to foreign policy, as some funds may not invest in certain countries. These actions take a more holistic approach to human welfare and will be necessary for financing the Sustainable Development Goals. The California Teachers Pension Fund (CalSTRS), Japan Government Pension Investment Fund, and the United Kingdom Universities Superannuation Scheme signed an open letter in 2020 underlining their commitment to sustainable capital markets.<sup>9</sup> However, some concern is that these investment decisions may be too politically influenced or give too little weight to economic analysis. For example, the California state pension fund, CalPERS, has divested from the tobacco industry and has invested heavily in the solar industry, but at the cost of returns well below its target (CSUERFSA, n.d.).

The globalization of capital provides opportunities for pension funds in advanced economies to earn a return in pro-business economies. Private pension funds have directed billions of dollars in North-South infrastructure investment or to acquire stakes in utilities. Pension funds in Denmark, for example, are committing capital to a climate investment fund that will finance projects that reduce greenhouse gas emissions in the Global South (Inderst & Stewart, 2014). Pension fund assets in developing countries were about \$2.5 trillion in 2014 and may rise tenfold by 2050 (Ibid.). Investments from developing country pension funds to advanced economies are occurring, too. Such East-West and South-North investments in real estate, utilities, and transport infrastructure provide diversification opportunities.

However, public and private pension funds may be subject to portfolio constraints that limit the asset classes that they can invest in. Many require pension funds to focus on government bonds that offer low returns predominantly. While serious risks are involved with aggressive growth portfolios, a too-conservative investment strategy results in missed opportunities. Countries including Chile, Colombia, Thailand, Nigeria, Mexico, and Costa Rica have placed restrictions on pension fund investment in infrastructure (Inderst & Stewart, 2014).

#### 6.1.4. Increasing equity

This subsection will discuss how pension policies can increase gender, intergenerational, and income equity.

Whether in advanced or developing countries, lower-income people have less financial capacity to save for retirement. Therefore, DC pensions on their own will not provide an adequate retirement. Universal social pensions (the first pension pillar) are thus necessary to provide a

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<sup>9</sup> [https://www.gpif.go.jp/en/investment/Our\\_Partnership\\_for\\_Sustainable\\_Capital\\_Markets.pdf](https://www.gpif.go.jp/en/investment/Our_Partnership_for_Sustainable_Capital_Markets.pdf)



minimum level of income for the poor, especially those who cannot rely on their family. Evidence from China has shown that the rural social pension has led to higher mental and physical health outcomes (Chen et al., 2017). Tax benefits to working children who care for their elderly parents can alleviate family poverty. Governments should consider how adjusting the retirement age will impact lower-income people, as they are more likely to live shorter.

Women earn less over their working life than men and take more career breaks. On average, a woman's pension pot is more than a quarter less than a man's. In Japan, a man's pension is almost double that of a woman. (OECD, 2021). Given that women tend to live longer, a woman is less likely to have an adequate pension upon retirement. Earnings-based DC pensions would exacerbate pension inequity precisely because women earn less and live longer. Employment policies can therefore tackle some of the root issues of pension inequality. These include making pension benefits accessible to part-time workers (who tend to be women in specific industries), offering parental leave to either parent or increasing gender balance within the firm. General policies include greater access to financial education, having married couples split their contributions between individual retirement accounts, allowing contributions during parental or caregiving leave (even including from the government), allowing extra 'catch-up' contributions upon returning to work, funding nursery/childcare, increasing plan transferability, and enrolment into more aggressive investment portfolios (FCLTGlobal, 2021b; OECD, 2021; Mercer, 2021). Guaranteed or minimum incomes can also help reduce elderly poverty among women. In Australia, more women than men have enrolled in the means-tested pension.

Public DB pensions (whether universal or for public sector employees) are redistributive. Unlike other social welfare policies such as healthcare or income redistribution, pensions involve a transfer of wealth across time. Intergenerational equity in pensions can mean different and sometimes contradictory things. It could affect the same pension entitlement across generations, same contribution levels, keeping the retirement age constant, keeping poverty levels similar across age groups, or keeping the length of retirement the same across generations. The degree to which current workers fund the pensions of future workers depends on the assumptions used for per capita economic growth or investment returns. If projections underestimate growth, current workers may overpay and transfer wealth to the future generation. If projections overestimate growth, current workers underpay and will require higher taxes for future workers. Unfunded liabilities among public pensions imply systematic underpayment of past workers or overestimated growth (The Terry Group, 2015). Intergenerational equity may mean that current workers fund the pensions of current retirees (as PAYG system), but that assumption breaks down in an aging society. When low economic or income growth meets an aging population, the result is lower after-tax income among workers. Such is the case in Japan (Takayama, n.d.). DC pensions, such as individual retirement accounts, involve no direct intergenerational wealth transfer. However, economic shocks will affect savings growth, which is more acute among people nearing retirement (Ménard et al., 2013).

### 6.1.5. Options for reform

Reform must consider country contexts, such as economic complexity, administrative capacity, demographic structure, and prevailing political ideology. Therefore, reform recommendations cannot be generalized but should be tailored for each country. Nonetheless, the suggestions below can serve as a general framework that can be adjusted for each country. Reform can be incremental or extensive. Gradual reform is politically easier but may bandage over a fundamentally flawed system. Wholesale reform requires political will – to overcome entrenched interests. (Economic Policy Institute, 2019).

Pensions should meet two criteria: adequacy and security. Adequacy refers to the extent to which pensions meet consumption needs. Security is the durability of the pension throughout the holder’s lifetime (Yik, 2021), i.e., whether the pension protects against longevity risk. In developing countries, reform should also aim to maximize enrollment.

Most countries have at least one of the three pension pillars outlined in the introduction, where most of the burden is placed on one economic actor (individuals, firms, or government). Spreading the burden across these three actors allows longevity risk to be shared and can increase the adequacy of retirement income. How the three pillars are designed and interact with each other is up to the policymakers in each country based on macroeconomic, social/cultural, and demographic considerations. The pillars should be designed to build on each other rather than dilute savings.

An extra pillar that is not directly tied to pensions involves expanding other aspects of the social safety net, such as healthcare, elder care, housing assistance, and heat/fuel assistance. These increase the adequacy and security of retirement income by paying for expensive consumption needs.

The Asian Development Bank provides recommendations on how developed and emerging economies can sustainability expand their pension system (Asian Development Bank, 2019). These include:

1. Establishing and expanding non-contributory pensions
2. Monitor and increase the eligibility for pensions in line with the life expectancy of the country;
3. Target benefits to the most vulnerable;
4. Have a mandatory unfunded or pre-funded contributory scheme for the employed;
5. Have pension systems that encourage labor force participation.

Proper long-term planning is essential. Adjustments to a government’s pension system usually occur when a different political party comes to power or during a fiscal crisis. Comprehensive reform is rare. ADB recommends implementing a long-term balance management framework that considers social, economic, and demographic changes (Asian Development Bank, 2019). Such long-term planning enables governments to view a suite of policy options such as setting

the retirement age, increasing financial literacy, increasing the working population (either through tax/welfare reform, migration, or increasing fertility), and over what time these policies should be implemented. Planning has the benefit of transparency: the public is aware of when it is likely that the retirement age will have to increase, rather than having it done abruptly (Sanderson & Scherbov, 2010). Gradual and predictable changes are more politically acceptable than abrupt changes. This long-term plan should consider the effects of reform on the labor market, social equity, migration, and education. The program should also assess healthcare quality for the elderly and have contingencies for people who cannot work.

Converting pre-funded (pay-as-you-go) to fully funded systems can reduce the government's burden on future public sector employees. DB schemes can be fully funded, but DC systems are more resilient to demographic changes because they are individually managed. On the flip side, longevity risk is delegated to the individual, so people need to make sure they have enough savings even if they do not know how long they will live.

The World Bank also outlines policies that can encourage saving for retirement. These include auto-enrollment into pension plans upon hire; setting up automatic contributions or reminders; or having financial institutions make it easier to set up and contribute to a pension product, no matter how basic (Grandolini, 2016). These behavioral approaches help rationalize decision-making by forcing individuals to consider their future. Research suggests that behavioral techniques are more effective in increasing savings than financial incentives such as matching contributions (Hinz et al., 2013). Hine et al. point to evidence in the United States and New Zealand that automatic enrolment/opt-out mechanisms have substantially increased enrollment among workers.

## 6.2. Pensions in Japan

Japan has a 2-tier pension system: a basic flat rate scheme (National Pension Insurance) and an earnings-based plan (Employees' Pension Insurance). These two plans cover all of the Japanese population. The EPI has evolved and expanded since its inception in 1942. It is an earnings-based plan that can either be DB or DC. The NPI began in 1961 and is mandatory for those between 20 and 59 (based on tax contributions) and those not enrolled in the EPI. It includes non-working spouses. Public sector employees receive a DB plan.

The Employees' Pension Insurance is voluntary; employers do not have to offer it, including small companies or self-employed people. If they do, contributions are shared equally between the employee and employer, currently 9.15% of salary each.

There are currently different eligibility ages for the NPI and EPI, but from 2030 it will be 65 for each plan for men and women. People can draw as early as 60 for a lesser payment or 70 for a higher pension. Japan's DC scheme adjusts to provide fewer benefits to people with lower contributions or require them to contribute more. Individuals can also have a voluntary personal

plan, known as iDeCo, where contributions are tax-deductible, though less than 2% of the Japanese population has an iDeCo.

Fiscal sustainability for the Japanese pension system is paramount for two reasons: one, it has the oldest population in the world – and therefore the highest pension expense relative to its economy – and two, it has the highest debt level in the world. The old-age dependency ratio is already high, at 50 older adults per 100 working-age people. It is expected to rise to 79 per 100 by 2050 (OECD, 2018). Japan is fortunate, however, in that it enjoys relatively low unemployment, even during the COVID pandemic. Maximizing the number of people working will help ensure the sustainability of the NPI and provide an opportunity for older people to work longer, even if it is part-time (OECD, 2018). Returning to work will, however, require investments in reskilling and healthcare. Options for older adults to continue working are low but growing: most firms require mandatory retirement at 60, although the percentage is declining. The rate of firms that have increased their mandatory retirement age to 65 is growing. Since the eligibility for the public pension will be 65 anyway, it would make sense for firms to increase the compulsory retirement age to 65. Some OECD countries have abolished mandatory retirement.

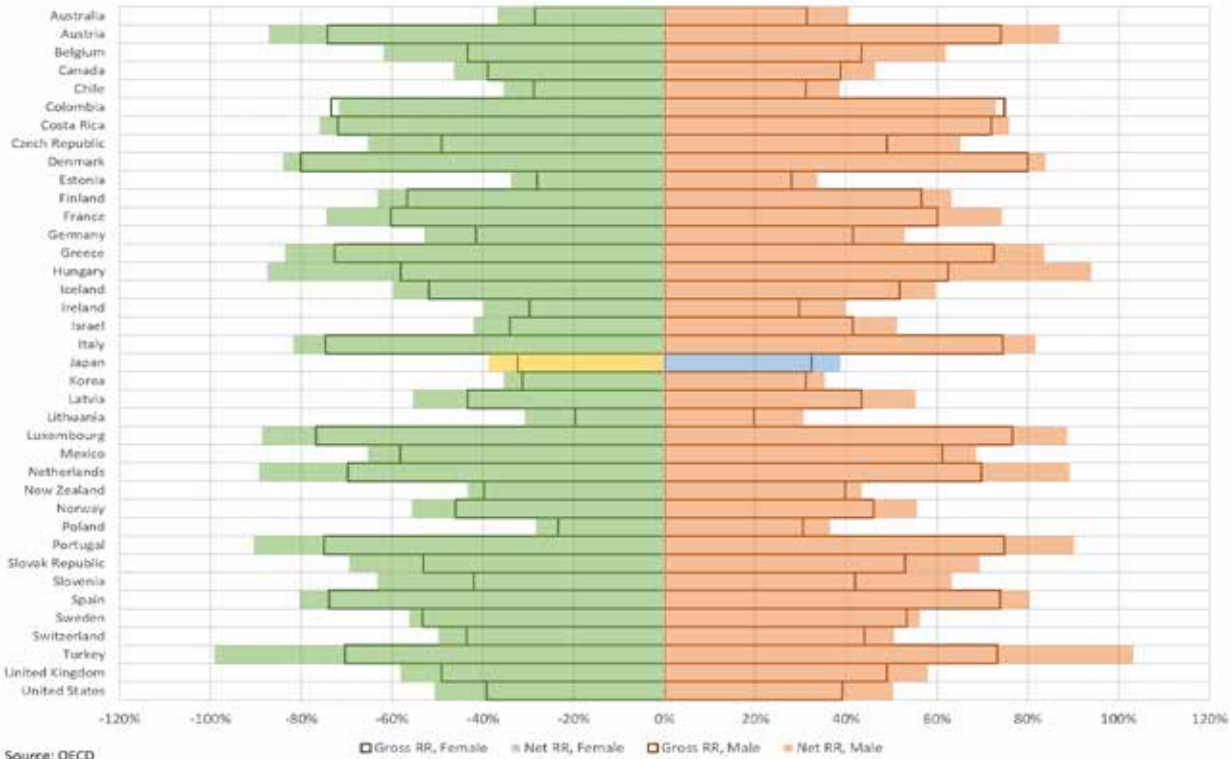
Employers have also struggled to ensure financial sustainability for their employees' plans, particularly during the stock market crash of the 1990s. The economic slump during that decade meant that many DB plans were underfunded. In 2001, the government introduced DC plans for employers, and since then, their use has grown while DB plans have declined. DC plans are not as generous as DB plans, but since they are prefunded, they are more secure, even if the company goes bankrupt. Workers can transfer their plans when they change jobs. There is also a voluntary individual pension plan for self-employed workers, freelancers, and students. Pension funds, investment banks, and trust funds used to be regulated in what they could invest in (a majority of their portfolio in bonds), but since the 1990s, they have had more freedom to control their portfolio. However, aggregate assets in DC plans have been on the conservative side, with most assets held in cash deposits and insurance products. The government has encouraged workers to pursue a more aggressive stance (Nomura, 2019).

### 6.2.1. Pension adequacy

Japanese pensions, on average, do not appear to be adequate for its population. Gross pension wealth, defined as the present value of the flow of estimated pension payments, is 6.2 times annual earnings for men and 7.3 for women. Net pension wealth, which considers taxes and social security contributions, averaged 7.4 times annual earnings for men and 8.7 for women (OECD, 2022). These values are relatively low when compared to the OECD average. The gross pension replacement rate is defined as the gross pension entitlement divided by pre-retirement earnings. It measures the effectiveness of the pension system in replacing work income. In Japan, the gross replacement rate is 32%, while the net rate is 39% (OECD, 2022). Both figures are below the government target of 50%. Moreover, though these percentages are the same for men and women, there is a significant gender disparity between the size of the average Japanese pensions.

The pension gap is almost 50 percent in Japan, meaning that men’s pensions are twice the size of a woman’s. This is the highest gap among developed and emerging countries, and ten percentage points higher since 2000 (Mercer, 2021). The similarity of replacement rates but the disparity in pensions suggests that the issue stems from a pay gap between men and women. The graph below compares Japanese pensions' gross and net replacement rates to other pensions in the OECD. Few countries in the OECD have lower replacement rates than Japan.

Figure 6.3: Gross and Net Income Replacement Rates among OECD countries

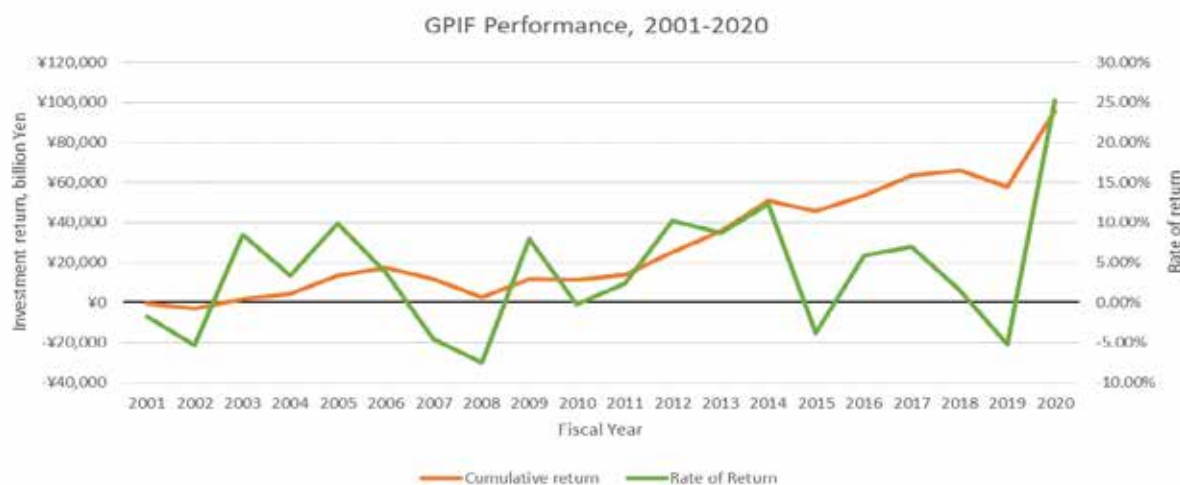


Source: OECD

In Japan, income poverty among the elderly is also relatively high, at 16% for men and 22% for women – higher than in the United Kingdom, Chechia, Austria, Slovakia, and Denmark (Mercer, 2021). These metrics may indicate that pensions are inadequate to support the desired level of consumption in the country. Indeed, elderly poverty in Japan (20%) is higher than the OECD average (12.5%) (OECD, 2018). Mandating a higher saving rate (premium) and encouraging a more aggressive investment strategy will help raise the replacement ratio.

## Box 1: GPIF Case Study

The Japan Government Pension Investment Fund is the largest in the world. GPIF has historically been conservative in its investment strategy. Two-thirds of its portfolio was in government bonds. To increase its returns, it diversified its portfolio in 2014 to reduce its holding of bonds and increase its holdings of equities. As of 2021, half of its portfolio is bonds (split roughly evenly between foreign and domestic), and the other half is equities (with a similar foreign-domestic split). It remains, however, a passive investor. GPIF became a signatory to the United Nations Principles of Responsible Investment in 2015 and is committed to environmental, social, and government (ESG) investment. It has averaged an annualized return of 3.8% since 2000, which is relatively modest compared to private equities (although much better than the annualized return of the NIKKEI). It is also among the lowest among pension funds in the OECD (*United States Chamber of Commerce*, 2020). Legal restrictions on GPIF's portfolio limit its rate of return. For example, only a maximum of 5% of its portfolio can include alternative assets (e.g., venture capital, commodities, real estate, and derivatives). By contrast, the Singaporean pension fund can hold up to 21% in alternative assets, while the Korean pension fund can hold 16% (Ibid). The figure below plots GPIF's return since 2000. There have been several periods where GPIF experienced negative returns, but the cumulative return has grown massively over time.



Source: GPIF.

Other countries in East Asia have launched similar public pension investment funds. Emerging markets can reap the advantages of setting up a pension investment fund once it has a sizeable middle class with savable income. The earlier a country begins investing its citizens' contributions, the more resilient it will be when it has an aged population.

Successful pension funds must have strong governance structures to protect against corruption and embezzlement. Transparency to investors and the public is paramount. Aggressive investment strategies are unnecessary; since pension funds invest long-term, a modest yet consistent return can still accrue a considerable amount. However, too low investment returns lead to underfunded liabilities and crowd out opportunities to invest in high-yielding infrastructure.

### 6.2.2. Recent and potential reforms

The financial sustainability of the NPI is under pressure because it is a PAYG system: current workers fund the pensions of current retirees. The government reformed the pension system in 2004 to improve the system's sustainability. Reforms included raising the pension premium from 13.6% to 18.3% between 2005 and 2017, ensuring that the income replacement ratio (the ratio between the pension payout and average salary) remains above 50%, financing half of the NPI from general revenues (and raising the consumption tax to do so), having five-year reviews of the pension system, and having an automatic control mechanism known as 'macroeconomic slide.' The macroeconomic slide lowers the inflation or wage adjustment to retirement payments. The fall is based on fertility rates and life expectancy. If the fertility rate declines and life expectancy increases, the gap between inflation and the adjustment made to pensions goes up. So, if inflation is 2%, the slide might be 0.5%, resulting in a 1.5% adjustment to pensions – amounting to a real decrease in pensions. If inflation or wage increases are low, the macroeconomic slide would require a nominal cut in pensions, but the government may choose not to implement it for that year. This would increase the real value of pensions (Nomura, 2019).

Japan last reformed its pension system in 2020, which will take effect in 2022. These reforms encompass four components (Mizuho Group, 2020):

1. Expand the EPI to include part-time workers in medium and large businesses.
2. For those aged 60+, the pension may be partially suspended if they are in work and meet income thresholds so that their eventual pension is revised upward when they retire later.
3. Increase the age of elective deferral to take a pension to 75.
4. Increase the maximum enrolment age for defined contribution plans to 70.

These reforms enable greater flexibility by encompassing part-time workers and letting older people contribute to their pension for a more extended period.

### 6.3. Pensions in Bangladesh

There are two pension systems in Bangladesh. One is the social pension which is a DB scheme. The other is an unfunded DB scheme for civil servants. The pension scheme for public civil servants and workers for public enterprises was introduced first but covered a tiny percentage of older adults in Bangladesh. Few private-sector employers provide a pension plan, and when they do, it is usually a gratuity or provident fund.

The social pension is known as the Old Age Allowance. It was introduced in 1998 and is enshrined in the constitution. General tax revenue funds the allowance. The age of eligibility is 65 for men and 62 for women. Only one recipient per household is eligible, and household income must be 3000 taka or less.



The benefit is 500 taka per month, paid every three months. Priority is given to vulnerable people, including low-income people, people with physical or mental illness, veterans, homeless people, widows, divorcees, and those without a family.

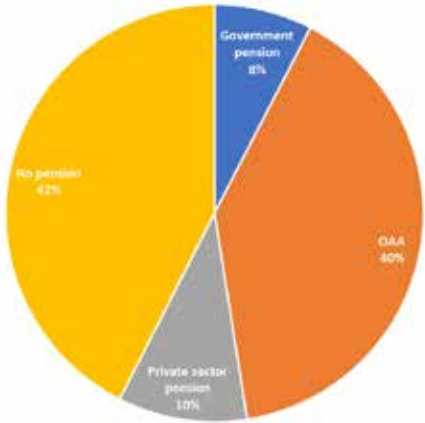
The civil servant pension is available for people 59 or over. They are not eligible for the old-age allowance. There are ten categories of the civil servant pension.<sup>10</sup> It is an unfunded, defined benefit scheme. Even though the civil service pension has much fewer enrollees than the OAA, it costs considerably more to the government.

6.3.1. Coverage

Pension coverage has considerably grown since the OAA was introduced in 1998, when 400,000 people were enrolled in the system, to 2.8 million in 2017 (Razzaque & Khondker, 2018). However, less than 60% of older adults in Bangladesh receive a pension, most of whom are covered by the social pension and the rest a private or government pension. For the 2021-2022 fiscal year, there were 5.7 million beneficiaries (Bangladesh Department of Social Services, 2021). As of 2018, the civil service pensions had 698,000 pension holders. Government expenditure on civil service pensions is high despite the low number of pensioners. The main reasons for this include higher life expectancy, inflation adjustment, and changes to pension entitlement. Figure 6.4 presents the distribution of pensions in the country.

The World Bank’s Atlas of Social Protection Indicators (ASPIRE) estimates a much lower level of total population coverage in Bangladesh, at just 1% for the private DC pension in 2018 – down from 1.6% in 2005 – and 5% for the social pension – up from 3% in 2005. Enrollment in the social pension is higher among people in rural areas than in urban areas.

Figure 6.4: Coverage by Pension Type



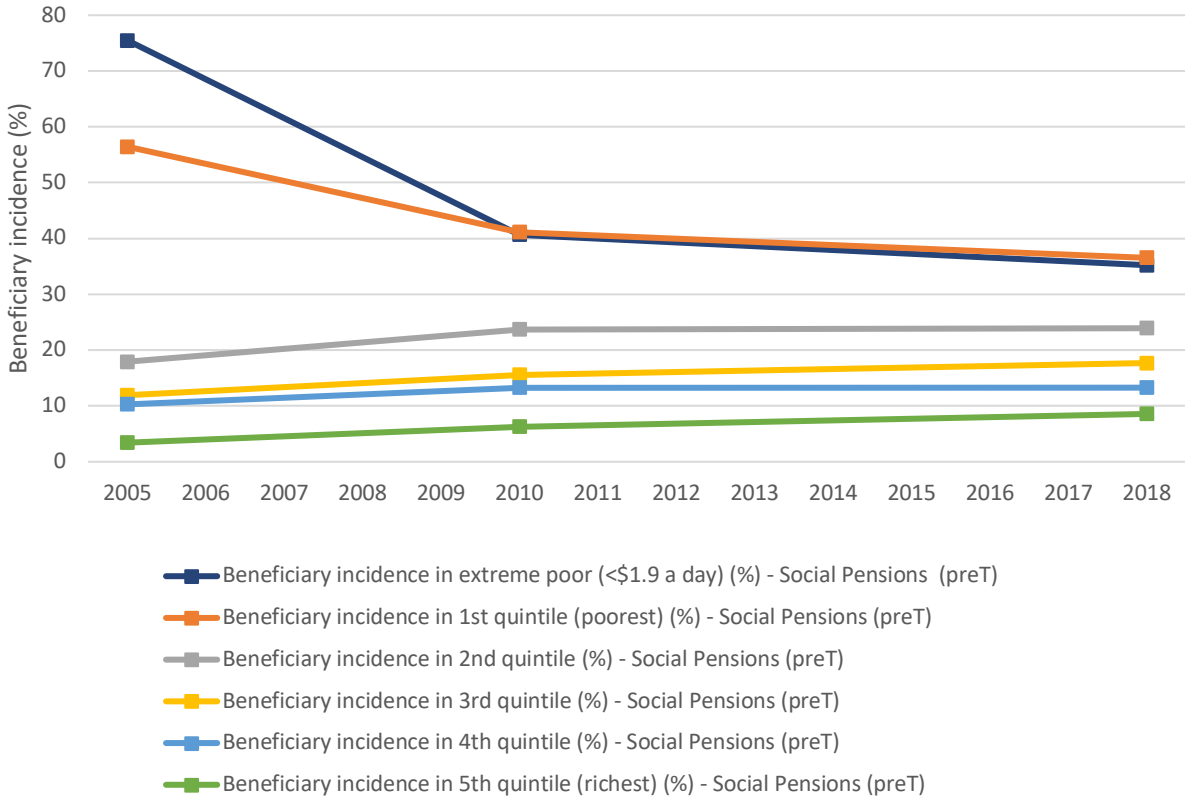
(Rahman et al., 2019)

<sup>10</sup> These include the superannuation plan, forced retirement pension, invalid pension, family plan, gratuity and commutation, benevolent fund, group insurance, general provident fund, medical allowance, and lump grant (Alam, 2018).



The OAA has increased coverage and benefits (from 100 taka to 500 taka) but is still insufficient to cover the vulnerable elderly population. Indeed, the beneficiary incidence – the proportion of households receiving a pension versus the entire population within a group – has fallen for the poorest quintile between 2005 and 2018. Nor has the OAA improved in reducing poverty headcounts or the poverty gap (the difference between current income and income needed to reach the poverty line). Coverage for the second and third quintiles is relatively low, at less than 30% of households (ASPIRE, 2022). The OAA’s means-testing leaves many elderly people in Bangladesh out of the system. These vulnerable elderly people may have an income too high for the OAA but too low to cover unexpected costs. Thus, there is a gap between those with meager income who qualify for the OAA and those that are lucky to have a secure government job, leaving the middle and working-class with no options.

Figure 6.5: Beneficiary incidence of OAA, 2005-2018



(ASPIRE, 2022). PreT = pre-transfer income distribution

### 6.3.2. Potential Reform

There are many opportunities to reform Bangladesh’s pension system to provide a good income source for the vulnerable elderly. The country is expected to continue its impressive economic

growth, primarily driven by its demographic dividend and increasing economic complexity. It is a good time for the government to increase its pension coverage so that its sizeable current workforce will have a comfortable retirement in a few decades.

Bangladesh can follow the pillar approach to create a nested set of systems that will provide some sort of pension regardless of income status. The first step would be to expand the first pillar – the social safety net – in both its coverage and its benefits. The case study below outlines details about the country’s recently announced universal pension scheme.

*Box 2: Universal Pension case study*

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Many elderly people in Bangladesh do not have enough savings or property to sustain them in retirement. This includes those in poverty but also the ‘vulnerable poor.’ Expanding the country’s social pension scheme would overcome the exclusion gap, even if it creates over-inclusion. The Government of Bangladesh has been considering a universal pension scheme. It has outlined the idea in its Seventh Five-Year Plan and recent government budgets (Rahman et al., 2019). A universal pension scheme would cost 5.5% of government revenue by 2030 for a benefit equivalent to the upper national poverty line, or 0.6% of GDP per year between 2021 and 2040 (ibid.).

In February 2022, the Government announced that it would be implementing a universal pension scheme. The current plan is to have people aged 61. It is a contributory scheme, requiring a minimum of ten years of contributions. The minimum deposit is 100 taka (\$1.50). A person depositing 1000 taka (\$11.50) per month between 18 and 15 will be eligible for an estimated pension of 64,776 taka (\$750) per month. Missed deposits will lead to a frozen account which can only be unfrozen after the missed payments are made and a late fee is paid. The scheme involves an individual retirement account that is not linked to employment, which removes the incentive for workers to keep their current job. The pension is tax-preferred: there are no taxes on pension withdrawals, and participants get a tax rebate on deposits. The Government will also subsidize deposits for lower-income people. Deposits will be pooled into a pension authority that will invest them (Daily Star, 2022). Government employees will not immediately be enrolled in the universal pension because the civil service pension covers them. The announcement comes after many years of deliberation, and it is unclear whether the legal and institutional framework will be ready by early 2023. Bangladeshis will need faith that the pension fund managing their money has a transparent and robust governance structure. The setup of the pension fund will take time and establishing a track record of good returns will take even longer.

Notwithstanding the need for an expanded social pension for the poor, an additional system – pillar two - will benefit the growing middle class in the country. The number of college-educated professionals is expected to grow considerably over the next few decades. This growth – an outcome of the demographic dividend – provides opportunities for policies that promote retirement savings, such as an employer or individual pension plan.

Creating a universal pension and employer pension scheme will require the formalization of the economy. As of 2019, the informal economy employs 85% of the total workforce (Rahman et al., 2019). These informal jobs rarely contribute taxes and face high administrative costs to set up a pension plan. One effect of having such a large informal economy is that Bangladesh has one of the lowest tax-to-GDP ratios in the world. Increasing tax revenues will be necessary to expand the social pension. Indirect taxes such as sales or value-added tax may be more effective in increasing revenue than income taxes in an informal economy.

However, the high share of informal employment does not necessarily mean that having a job-based contributory pension would be premature. India has a large informal economy but has created various pension products under different pillars (social pension, employer provident fund, national pension scheme, micro-pensions, and voluntary tax-advantaged schemes). The World Bank has noted that other countries have introduced innovative ways to encourage savings, including Kenya and Mexico. For example, community groups can manage pension plans for informal workers; ATMs and retail outlets can allow contributions; and pension payments can be set up on mobile phones (World Bank, 2016).

#### 6.4. Pensions in Nigeria

The main pension scheme in Nigeria is the Contributory Pension Scheme (CPS). A national DC scheme is rare in sub-Saharan Africa: only two other countries have similar schemes, while most other countries have a Pay-As-You-Go defined benefit scheme (Dorfman, 2015). It was introduced in 2004 after ten years of having the more common PAYG DB scheme, which suffered problems including delays and misappropriation of funds. The CPS is a mandatory scheme, though coverage is only 8%. It is privately managed. In 2014 it was extended to include small businesses and self-employed people. Workers must work a minimum of 35 years to be eligible for a pension.

Like Bangladesh, Nigeria offers a more generous civil service pension scheme. Unlike Bangladesh, it is a DC scheme with 10% of monthly salary coming from the employer (i.e., government) and 8% from the employee. The conversion from a DB to a DC scheme avoided the earlier problems of delayed payments and accumulation of arrears because the DC scheme no longer relies on annual budgeting; the money is already there (Dorfman, 2015).

The National Pension Commission, set up after the 2004 reform, oversees the Contributory Pension and the civil servant pension. It regulates all Pension Fund Administrators, which are private companies that manage each employee's personal retirement savings account. In 2018, NPC allowed PFAs to offer four investment portfolios, depending on an enrollee's age and selection. Contributions and investment growth are tax-free.

Reform in 2014 required each of Nigeria's 36 states to implement the CPS. Each state legislature has to pass an enabling law for the CPS and establish a Pension Bureau that implements the scheme. Two states have introduced pilot social pensions. Ekiti has its own non-contributory

pension scheme. It was introduced in 2011 for state residents above 65 years and provides 5000 Naira a month, or \$12. The pension is targeted at those with low income with no other pension. Osun, the other state, followed a year later with a pension of 10,000 Naira (\$24) a month. The pension is also targeted at vulnerable older adults. However, neither state pension appears to cover more than one percent of the respective state's elderly population (Pension Watch, 2022).

Though the CPS was introduced to overcome the misallocation of funds that plagued the DB predecessor, many pensioners from the public sector who have contributed to the system have stopped receiving pensions because they were accidentally declared dead. As of 2019, 400 billion Naira (\$1 billion) was still owed to pensioners (Adagoke, 2021).

#### 6.4.1. Coverage

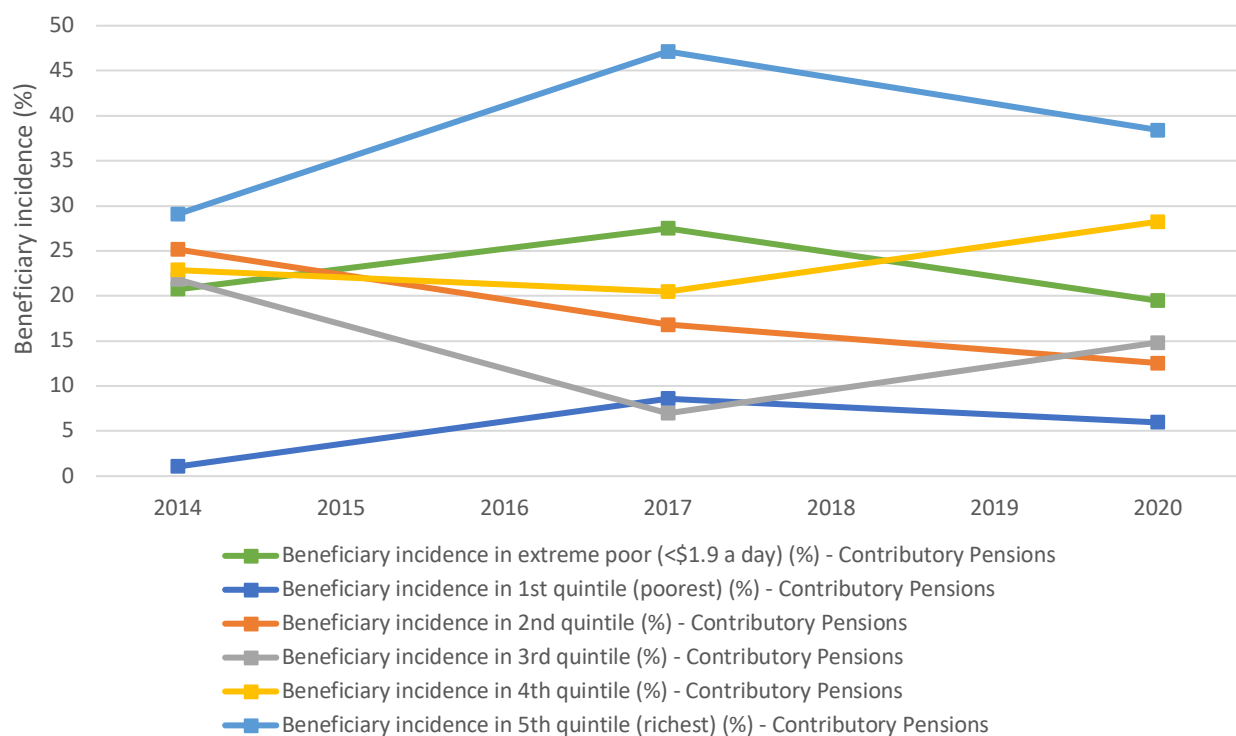
Around 8% of the population, or 15 percent of the workforce, have a retirement savings account. The main reason for such low coverage is the fragmented implementation and high level of informal workers. Nigeria's federated system means that each of the 36 states in the country is in different stages of creating a legislative framework to enroll in the CPS. As of 2021, just Lagos and Abuja have fully implemented an institutional framework for the CPS.<sup>11</sup> Ekiti has its own non-contributory pension scheme, and Jigawa state has a similar DC system for public sector employees that preceded the federal government's reforms. Seven states have not passed pension laws as of the end of 2020 (Adegboyega, 2021). Others are considering adopting Jigawa state's model because it is older.

The other reason for low coverage is that, as a DC system, it relies on people with enough savable income to participate. Predictably, the highest beneficiary incidence is among the wealthiest quintile at about 40% of households in 2020. Conversely, those below the international poverty line have a higher benefit incidence than those in the bottom or second quintile. However, it does not seem that the CPS offers any subsidy to the poorest.

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<sup>11</sup> Five states have chosen to provide alternative pension arrangements.

Figure 6.6: Beneficiary incidence of contributory pension, 2014-2020



(ASPIRE, 2022)

The National Pension Commission is keen to attract more people into pension programs (targeting 30% of the workforce enrolled in a pension by 2024). The recently announced micro-pension scheme has been one tool to do that. Hopefully, the plan will expand coverage for roughly 70% of the workforce that works in the informal sector (Iwelumo & Olanipekun, 2017). Global financial companies and pension funds are beginning to notice Nigeria's potential because of its large population and its status as a regional powerhouse.

*Box 3: Micro-pension case study*

Micro-pensions were introduced in 2019 to help people with low or irregular income save for retirement. It is also available for high-income earners and small and medium enterprises. It is a defined contribution scheme, and people can save whenever they want; there is no schedule, although at least one contribution has to be made a year. Nigerians can also contribute however much they want. Payouts are either through regular withdrawals or a lifetime annuity. According to the World Bank, there were 64,000 registered contributors by only 6,200 active contributors (Guyen et al., 2021). There is no mandatory retirement age. Money goes into two funds: a Retirement Fund (60% of deposits) and a Contingent Fund (40%) so that in times of income shock, people can withdraw early from the contingent fund. Private pension fund administrators manage these accounts. Nigerians have a choice in where they deposit their

money. The Pension Commission sets a limit on the administration fees that these fund administrations can charge (20 Naira - \$0.05 - for contributions below 4,000 Naira and 80 Naira for any amount above)

The program is still nascent and has suffered setbacks because of national and global macroeconomic shocks such as high inflation and the COVID-19 pandemic, which have eroded savings. Private pension fund administrators and entrepreneurial startups face challenges in overcoming skepticism, so informal workers are willing to sign up for a micro-pension because of widespread distrust in having third parties manage peoples' retirement savings. Awareness-raising needs to continue at this early stage, and incentives for saving may help overcome some skepticism.

Nonetheless, there is a lot of potential for the scale-up of micro-pensions in the country and other countries with a large informal economy. Similar initiatives are in Kenya and Ghana (Akwayiram, 2022). Nigeria has a high internet, and mobile phone penetration rate, enabling electronic contributions will increase accessibility.

## 6.5. Conclusion

Japan, Bangladesh, and Nigeria illustrate the challenges and potential solutions that countries worldwide are facing when it comes to retirement.

Many advanced economies are not far behind Japan's demographic structure and will need to ensure that pensions continue to be sustainable even when the number of older adults increases, and the working-age population shrinks. Current unfunded liabilities will only worsen if economic growth or investment returns continue to be lower than predicted, creating an inequitable burden for younger generations. Increasing contribution rates (either through taxes in a DB system or savings in a DC system) will ensure adequate income upon retirement. Raising the retirement age should be planned over several decades so that people have enough time to adjust.

Bangladesh is one of many young countries but will rapidly age because of falling birth rates and longer life expectancies. These countries are enjoying robust economic growth, yet the pension system (the administrative capacity, capital market maturity, and comprehensiveness) is still under-developed. Recognizing this, Bangladesh is planning to expand its social pension program to become universal.

Nigeria has a meager pension coverage but has more time than other countries to develop a comprehensive system before it ages. Its federal system has led to diverging implementation at the state level. It has placed greater faith in private finance by switching from DB to DC pensions (i.e., switching from a tax-funded system to a wage-funded system) and has a growing set of pension funds. It is experimenting with a micro-pension system to target informal workers and SMEs. Other countries have implemented similar programs, and there is room for replicability

among countries with high levels of informal work. Increasing financial literacy will take time, mainly because poorer workers have other consumption/saving priorities and may not trust financial institutions. In the longer term, countries like Nigeria and Bangladesh should continue formalizing their economy to have a broader tax base so workers receive more benefits upon retirement.

In addition to the diversity of countries globally, there is also large diversity within each country. Governments should recognize that a single pension system with rigid rules, while easy to implement, will have different benefits to different people. Women earn less money, take more career breaks, and face greater labor discrimination. DC systems, therefore, lead to lower benefits for them. Flexible contribution rules offer a way to increase savings among people with irregular income. Overall, multi-layered pension systems ensure that everyone has some minimum level of income no matter how poor they are or how long they live. There is no exact formula for the best funding allocation between government, firms, and individuals. Indeed, how the different layers are designed and interact with each other is up to the policymakers in each country based on long-term, comprehensive analysis, and political appetite.

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## 7. Overview of Healthcare

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*Shi Chen & Xuedi Yan*

### 7.1. Introduction

Healthcare services include prevention, treatment, rehabilitation, health consultation, and nutritional guidance, which are essential for human survival (JBLearning). The healthcare industry meets the needs of individual survival, development, and leisure requirements, which together improve the quality of people's life. It also plays an important role in maintaining the quality of the labor force,<sup>12</sup> ensuring the development of social production, and promoting the national economy. The need for health care is unlimited, yet the resources for health care are scarce. Health care services are generally divided into basic health care services and special health care services (Unfried & Bergstresser, 2018). Basic health care services are provided by the government according to the national financial resources, collective and individual economic affordability in a certain period and under certain economic development level and resource conditions. Most workers have equal access to the medical and health care services necessary to maintain their basic health conditions. It is mainly the treatment and prevention of common diseases, frequently occurring diseases, infectious diseases, and diseases with low cost of diagnosis and treatment that endanger life..

The main goal of the healthcare system is organizing available resources reasonably to meet the medical demand in accordance with the social development. However, this is difficult to accomplish perfectly. First, because it involves many systems, including individuals, organizations, governments, and society, with intricate relationships among them. Second, due to the unpredictable demands of the healthcare industry, it is impossible to allocate resources accurately. The development of technology is endless, and people's expectations for life and health are endless, while the fund-raising is limited. Especially with the progress of aging, the contradiction between supply and demand will become more prominent. Third, without healthcare insurance, it is difficult to get the same service at a reasonable price.

The guarantee of healthcare must be achieved through the purchase of healthcare insurance. On the one hand, the continuous improvement of the healthcare security system will provide a stable source of funds for the national health, which will eventually be converted into the income of medical and health institutions through the purchase of services, providing a stable source of funds for the development of medical and health undertakings. On the other hand, healthcare security institutions, as representatives of the interests of all insured personnel, will play a role of supervision, restriction, and guidance to institutions in the process of purchasing healthcare services, which is conducive to the formation of external checks and balances mechanism,

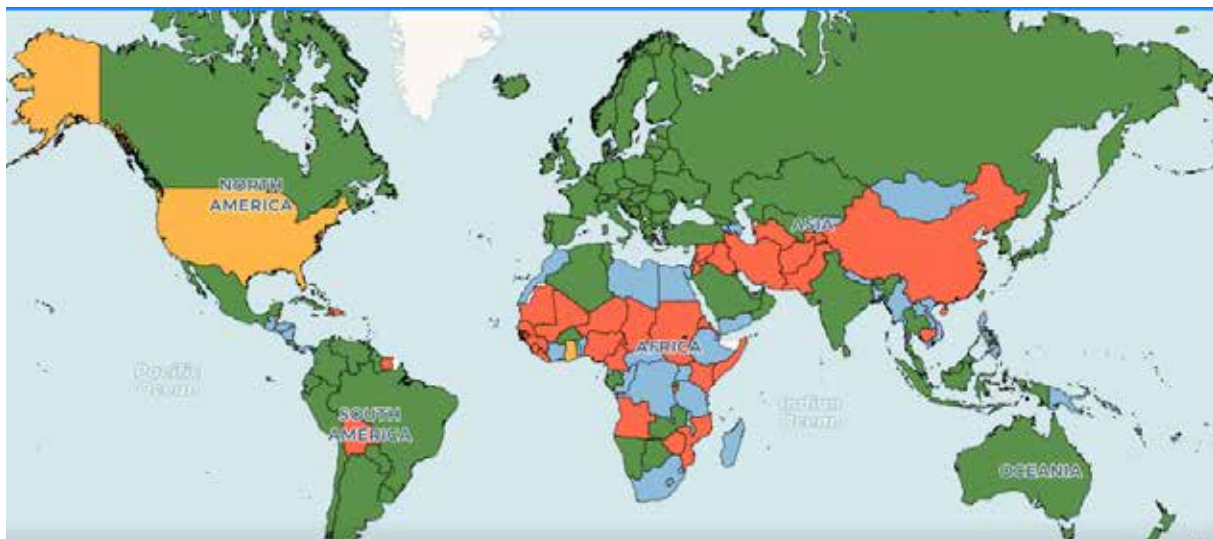
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<sup>12</sup> A sick worker cannot work as effectively or at all, as the COVID pandemic has demonstrated.

standardize medical service behavior, promote the reform of health system and strengthen the management of healthcare institutions.

There are generally five main methods to fund a healthcare system: General tax on state, county, or city; Social health insurance; Voluntary or private health insurance; Out-of-pocket expenses; Donations to medical charities (HealthKnowledge, 2017). In most countries, a mixture of all five methods is used, but this varies according to different national and economic conditions. Figure 7.1 embodies the health care services of the current state of the world: dark green, on behalf of the free and universal health care, brown represents countries with universal health care but not free medical care, blue for free but not universal health care, red represents no free medical care no universal health care, grey represent the condition of the unknown. The current state of health care systems in Japan, Bangladesh and Nigeria will be discussed below.

*Figure 7.1: Universal Health Care in the World (2022)*



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## 7.2. Healthcare in Japan

Japan is a country with large percentage of aging population. The proportion of the population aged over 65 in Japan is 28.4 percent in 2020, much higher than the international standard of an aging society defined as over 7 percent of the population aged over 65 (Statista, 2022). To this end, Japan has revised the famous Six Social Welfare Acts: The Act on The Protection of Life, the Act on the Welfare of Children, the Act on the Welfare of the Physically Handicapped, the Act on the Welfare of the Mentally Handicapped, the Act on the Welfare of the Elderly and the Act on the Welfare of Single Parent Families (Regulation, 2008). These six acts are the legal guarantee for the welfare of the whole people in Japan. At the same time, Japan also has a sound social

security system, including public assistance such as minimum living security, social insurance, free medical care system. Japan's excellent medical system not only cares for the quality of life of all citizens, but also contributes greatly to Japan becoming the country with the longest life expectancy in the world, 87.14 for women and 80.98 for men, according to 2017 statistics (Commons, 2020).

Japan's healthcare system combines the strengths of the medical marketization system in the United States and free medical care system in European countries, with obvious institutional advantages. European countries implement public medical system, which is almost free medical system (Insurance). Although this kind of medical system has a wide coverage and light personal burden, its efficiency is relatively low, and the waste of medical resources is very severe. In the long run, an excessive fiscal burden, especially as the population gets older, will fall into an unsustainable welfare trap. However, the medical system of the United States is completely privatized and marketized (McKee & Stuckler, 2012). This caused many people in the states not able to afford medical services despite the advanced medical technology available.

Japan's system has absorbed the strengths of both European and American systems and rejected the weaknesses of both. In other words, while carrying out free public medical care to a certain extent, private and personalized medical service needs are fully considered. In this way, the advantages of the two systems of Europe and the United States will be combined to give full play to the advantages of the system. That is the greatest strength of Japan's health system. Compared with developed countries in Europe and the United States, Japan's healthcare system not only reduces the waste of medical resources and maximizes the role of medical resources, but also reduces the burden of medical treatment to the maximum extent of the people, so that people can afford to see a doctor and will not affect the quality of life of individuals or families.

Japanese national healthcare insurance divided in three main categories. Each kind covers about one third of the insured people (Fund, 2020). The first type of health insurance covers employees of large enterprises and government and their immediate family members. The second type of government-managed health insurance covers employees of small and medium-sized enterprises and their dependent immediate family members. The third category of national health insurance covers sole proprietorship and pensioners. Union health insurance in category one generally has a lower rate and can be paid. On the contrary, the third category has higher rate to pay, while those in the second category are in between. This health insurance system may seem unfair on paper, it actually provides equal access of important medical services to everyone. In addition, any insurance company will reimburse the subscribers in full if they pay more than 63,600 yen per month (Japan M. o., Social Security in Japan). No matter which insurance category is chosen, the cost of accessing the medical establishment is roughly the same. In short, the key to maintaining this basic equality system is for the second and third categories of insured people to be replenished by the state financially.

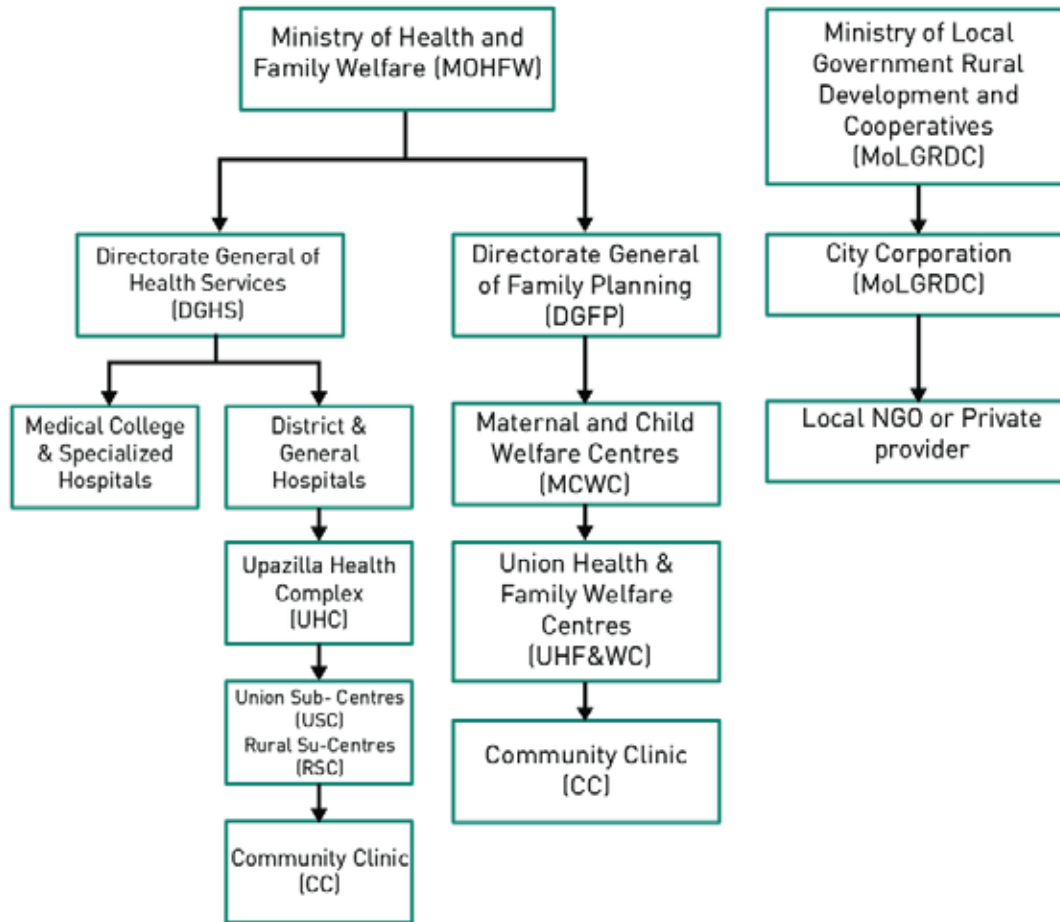
In addition, since Japanese public hospitals are non-profit public welfare institutions, aiming at improving efficiency, providing transparent services and stable operation, the average healthcare

income/expenditure ratio in Japan has been increasing year by year since 1990 (Japan S., 2020). Public hospitals are generally in deficit, and the deficit is partly subsidized by the state and local finance. In response, the government increased the proportion of patients' own expenses and raised insurance rates. In fact, raising the burden on individuals is highly controversial. First, most of the medical expenses are spent on a small number of patients with high medical costs. These patients rely on high medical expenses and then can still obtain compensation, so even increasing the proportion of individual burden will not restrain the medical expenses. Secondly, if the amount of burden is increased or decreased according to the level of income and the duration of illness, administrative expenses will be greatly increased, which will increase the burden of high-incomer and those who pay more insurance. Finally, because the income level and age structure of the insured personnel in various insurance companies are very different, the state should still provide necessary subsidies from the general resources, which will be a great burden for the national insurance.

### 7.3. Health care in Bangladesh

The Ministry of Health and Family Welfare (MOHFW) is the regulatory authority for institutional health services in Bangladesh and works on macro level policy, planning and decision making. The MOHFW has four divisions, namely the Director of Health Services, the Director of Family Planning, the Director of Nursing Services, and the Director of Drug Administration.

Figure 7.2: Health care system structure of Bangladesh



The ministry was responsible for receiving and taking care of the residents in the hospital, divided into four classes by different administrative divisions. Specialized institutions operate at the national level. These offer a wide range of services, including specialized pathologies such as cardiology, cardiac surgery, dentistry, endocrinology, medicine, nephrology, neurosurgery, oncology, ophthalmology, orthopedics and psychiatry (Rahman,2006). Level I institutions are equipped with a full range of inpatient and outpatient systems and undertake the care of patients until they are cured. However, due to the minimal scale of work of the Bangladeshi health care system, the patient information collection system is not well developed, and patients cannot be treated in different hospitals. This limits the flexibility of access to care and the act of data collection on cases. At the regional level, medical school hospitals offer a range of specialized research institute facilities to treat complex cases. These hospitals must receive cases that cannot be resolved by subordinate tier hospitals. The latter two levels are the district level and the *upazilla* (sub-district) level, which are responsible for providing primary health care services to the neighborhood. However, the street level is too low, and the jurisdiction is not specialized, so the construction of many medical facilities is only at the proposal stage and cannot be put into actual use.

In the case of uneven distribution of health care facilities, but the establishment of existing facilities still does not ensure the provision of services to the population. Statistically, the majority of those who receive hospital treatment and give positive feedback are from the wealthy class, and only the wealthy have the ability to pay when they need to pay out of pocket. Five times as many privileged patients from the richest receive hospital care than from the poorest patient class. And more than twice as many patients are treated in urban areas than in rural areas, and male patients are more likely to receive adequate and quality care than female patients. In addition to this at the health system level, Bangladesh suffers from a shortage of health care providers, poor nursing capacity, skewed manpower distribution, and deviations in spending patterns resulting in poor overall integrated health services.

When the World Health Organization's health equity goal of a "health for all policy" was introduced, Bangladesh's health system was at a disadvantage in this regard. As a developing country, Bangladesh's gross national product (GNP) is among the most underdeveloped in Asia, with an annual per capita income of about \$600. On this basis, Bangladesh spends most of its money on health services out-of-pocket, paying a higher percentage of private health expenditures (92.9%) than India (89.2%) and Nepal (79.9%) (Majumder,2011). The percentage of expenditures on each of these health care items again was 65.0% for drugs and pharmaceuticals. Therapeutic services (22.0%), ancillary services (9.0%), outpatient and family services (4.0%), and general government health administration (less than 1.0%).

The impact of out-of-pocket payments can be fatal for populations in countries with widespread poverty, where families may choose informal health care due to overpayment. Although they may receive partial care, treatment from unprofessional local government health structures can result in a severe illness. In order to pay high medical bills, some families may sell their movable and immovable property, which in turn makes them poorer. As a result of excessive health expenditures, families may need to ration their budgets on the cost of living, making social families face more social risks due to medical expenses.

Bangladesh has a pre-existing health insurance system where people's access to social welfare is contingent on being in the labor force. This leaves the informal workforce, which accounts for 88% of the total workforce in Bangladesh, in a passive position, unable to access social health insurance services and relying on out-of-pocket payments if they need to see a doctor. It is worth acknowledging that in 2017, Bangladesh established the Community-Based Health Insurance (CBHI) (Ahmed,2018) mechanism to benefit informal workers, however, as the medical information collection system in Bangladesh is not yet in place, the available information cannot prove the prevalence of using the benefit and the extent of the workers' audience. There are still challenges with this project, and the Social Information Network needs to be further refined in order to accurately analyze possible issues such as its functionality and limitations.

## 7.4. Health care in Nigeria

Nigeria has not given high priority to the development of its health system because of its low level of economic development. Health care needed to be emphasized in order to improve the physical fitness of the nation to become a major factor in revitalizing and strengthening the development of the Nigerian nation. Policy makers began efforts to establish a health care system in 1960 until 1980 when the basic concept of primary health care (PHC) was introduced and the accompanying The National Basic Health Services Scheme (NBHSS) was established. Services Scheme (NBHSS) was a national program based on the concept of PHC (Aregbeshola,2017). However, the health care system of NBHSS and PHC scheme could not be implemented in Nigeria due to the imperfection of the policy system and its implementation.

After the failure of the previous realization of the health care plan, a comprehensive national health policy based on PHC was reintroduced in 1980. The policymakers delegated the scope of universal access directly to local governments. PHC was adopted as a model for experiments in 52 local government areas at the beginning of the project and then expanded to all local governments. The facility types of health centers within PHCs are classified into three types: comprehensive health centers (CHCs); primary health centers and basic health clinics (BHCs) (Obionu, 2007). The program was implemented in response to the World Health Organization's call to achieve health for all. Thus, the second PHC was established to be effective, achieving universal immunization of more than 80% of children in the initial phase. The policy was initially intended to bring about the beginning of an understanding of the importance of health care in Nigeria, both in terms of policy and people, through national policies such as free immunization of children, mandatory recording of maternal mortality data, encouragement of universal national vaccination nationwide, and educational AIDS campaigns.

Based on the PHC program, the National Primary Health Care Development Agency (NPHCDA), a government agency dedicated to overseeing the health care system, was established. However, only around 20% of Nigeria's 30,000 primary health care facilities are operational, owing to a lack of ability to deliver basic health care services, as well as insufficient staffing, inadequate equipment, uneven distribution of health personnel, low quality of health care services, poor medical conditions and inadequate supply of essential drugs. The proliferation of counterfeit pharmaceuticals has a disproportionate impact on older persons in rural areas, who are mostly impoverished and illiterate and have limited understanding of health care (Ekoh,2022). This has a significant impact on the health and financial well-being of those who pay for their own prescriptions and medical services.

In addition, the deficiencies of the government blame sector also contribute to some extent to the difficulty of rapid universal access to full-name basic sanitation. The World Health Organization recommends investing at least 5% of GNP in the national health component, while most of the developed countries meet this condition, most of the developing countries are in the range of 1%-4%, it is obvious that Nigeria's investment is lacking (Alenoghena,2014). On this



basis, local governments that need significant funds to invest in the health care of the population in their jurisdictions tend to receive the least amount of budget. The funds available for health care in Nigeria are shared among all sectors of authority, and large sums have been taken at the national level and by the state governments in large proportions, leaving only a very small amount of funds at the disposal of the last large number of street-level sectors that bear the responsibility for primary health care. This has resulted in the infrastructure, as mentioned earlier, being built by the state, but very little of it is operational and functioning.

In this case, Universal Health Coverage (UHC) in Nigeria was difficult to achieve and in search of a solution, the government created the National Health Insurance Scheme (NHIS) to formally allow private sector participation to fill the gap in government funding. The NHIS is divided into three implementation programs, one being the Formal Sector Social Health Insurance Program (FSSHIP), to protect the insurance rights of government employees. The other two programs, the Urban Self-Employed Social Health Insurance Program (USSHIP) and the Rural Community Social Health Insurance Program (RCSHIP), are voluntary, non-profit programs based on the Community-Based Health Insurance (CBHI) model that are not under the jurisdiction of the government. Under this decentralized health insurance system, many local governments are not authorized or even able to manage the residents of their areas because of the national situation and the unique tribal culture of the African region that has not yet completed the process of convergence with the urban hierarchy. The majority of the urban population is resettled and receives some quality of health care and is the source of most of the 30% of the national insurance coverage.

However, the CBHI approach to health insurance, which is not governed by a governmental authority, is not adapted to long-term development. There are limitations to services set up only by mass organizations for self-protection to share expenditures on medical services. The community-based approach dramatically limits the population's access to health care services. Access to CBHI is often limited to community-level health care facilities that are not fully equipped and staffed by professionals who cannot perform the essential functions of providing care to the population. Health problems in Africa are also one of the significant influences that hinder the progression of healthcare. The government needs to find a way to shift from the existing treatment-based approach to preventive medicine to focus on treating existing diseases and prevent the possibility of future medical problems.

## 7.5. Conclusion

The healthcare sector is one of the most important areas affecting the global population, and the stability of healthcare services is a reflection of a country's ability to maintain economic stability. There are four definitions of health care equity: equity of access, equity of need, equity of access, and equity of health. Health care equity is pursued by granting universal access to residents of different positions, status, and ages. The results of health care implementation reflect different scales in countries with different development processes.

Developed countries such as Japan already have a relatively complete system, from policy and regulatory framework, insurance design, infrastructure placement, practitioner allocation, and other factors that will occur in the health care system with high integrity. In Bangladesh and Nigeria, on the other hand, due to the low levels of industrial development, the emphasis on the healthcare system at the national level started late, and the system needs collective support from all sectors to be built. This is the root of the problem that these two countries do not have a complete healthcare system to date, and there are many loopholes in the mechanisms that operate today and do not complete universal access. The background of the health care system is introduced for later discussion of the pressure on the social and economic benefits of the health care system, technological facilities, and climate change dimensions in the advent of an aging society. The response is to establish the ripple effects of the existing health insurance system. The purpose of this paragraph is to complete a more detailed background introduction, so as to facilitate the subsequent reading of the senior health care section to provide a foreshadowing of social problems and uncommon challenges that arise.

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## 8. Senior Healthcare

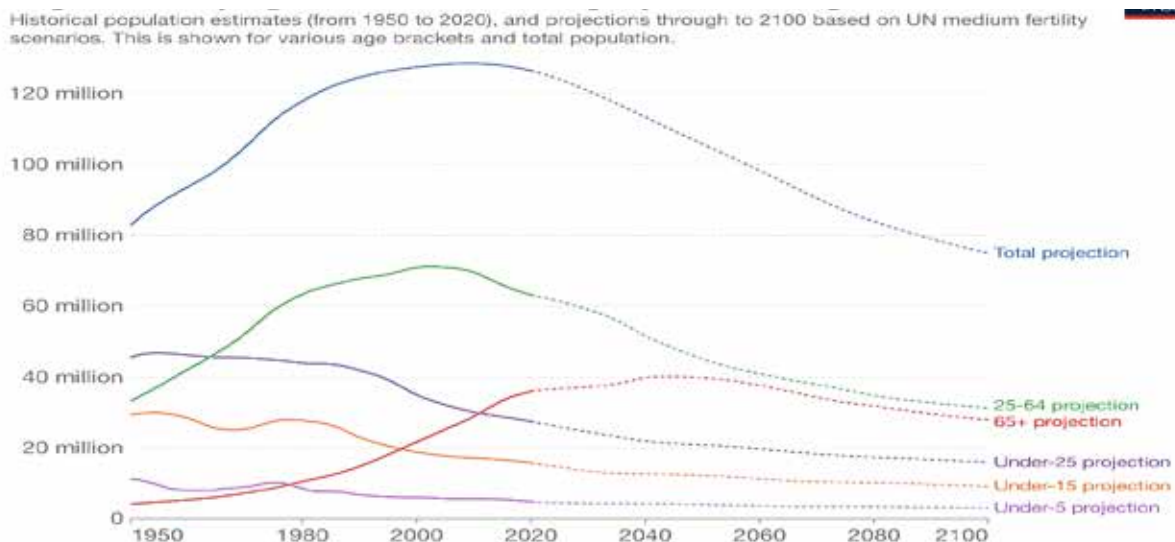
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### 8.1. Introduction

As fertility and mortality rates decline in most countries, the world is undergoing unprecedented changes. With the help of emerging technologies and healthier lifestyles, people are increasingly living longer, and the world is subsequently ushering in a period of full population aging. According to the UN report "Global Health and Aging," the number of people aged 65 or older is projected to grow from about 524 million in 2010 to nearly 1.5 billion in 2050. The most important sign of global aging is that the global number of newborns is lower than the number of people over 65 years of age. The intersection of these two demographic values has occurred globally in 2018. This means that the global population has entered the era of population aging. And there are different manifestations in different countries, the intersection of the two population values comes much earlier in developed countries than in developing countries.

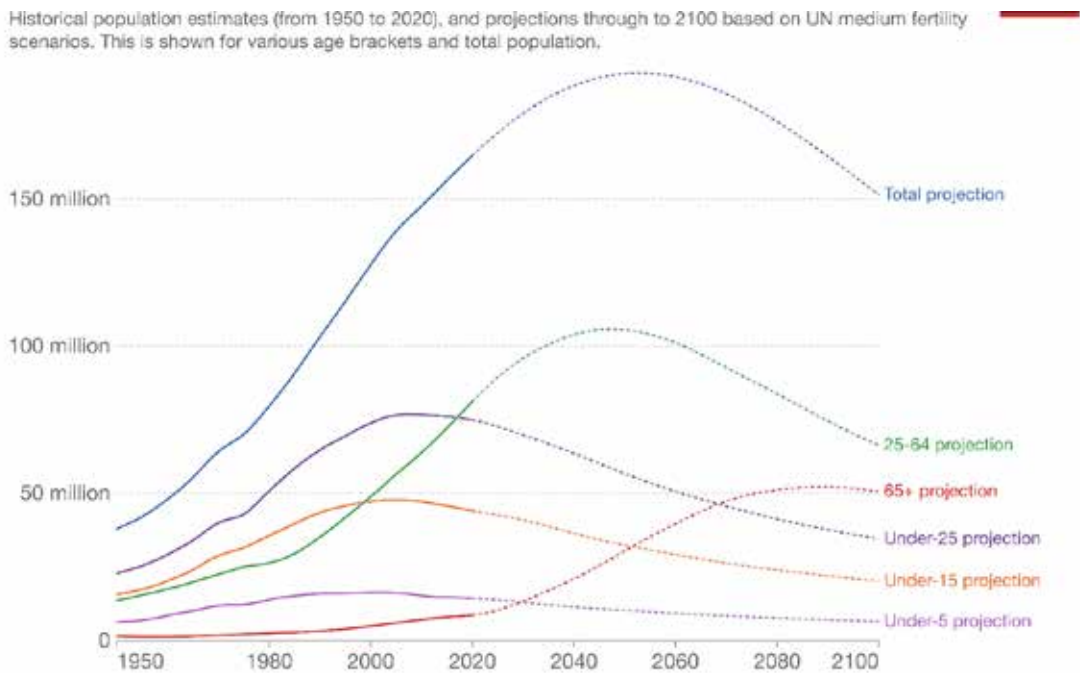
Japan completed the intersection of the total number of elderly people over the total number of children under 5 years old long before 1980, and even in 2017, the number of elderly people over 65 years old already exceeded the total number of young people aged 25 (Figure 7.1). The aging era has not yet arrived in Nigeria and Bangladesh. Based on the current demographic changes, it is assumed that in the future period 2070-80, the population of people over 65 years old will be higher than the total population of children under 5 years old in these two countries and will enter the ranks of the aging countries (Figure 8.2 and Figure 8.3).

*Figure 8.1: Population by Age, 1950-2100, Japan*



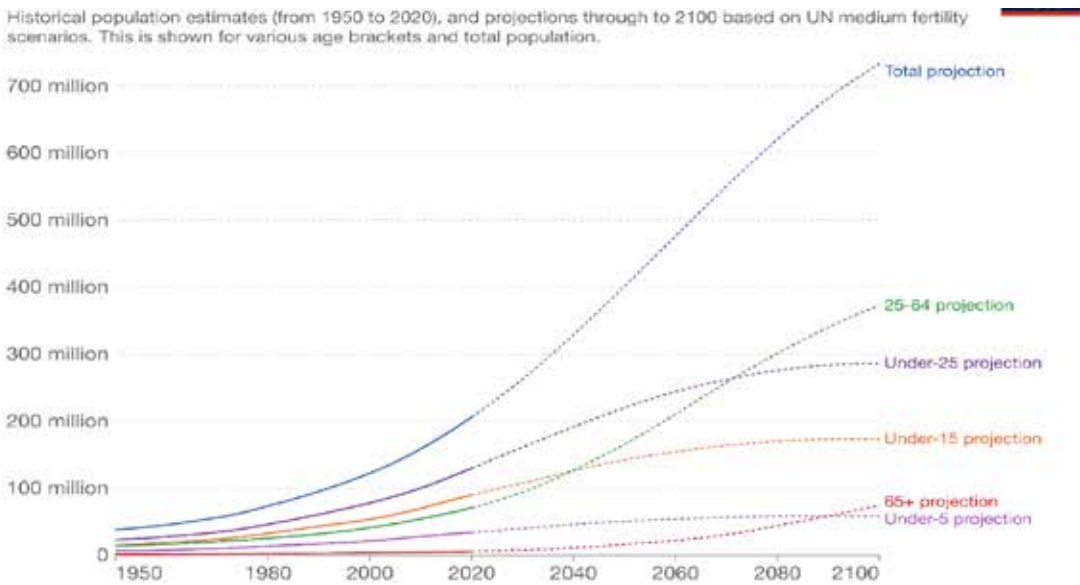
Source: United Nations Population Division

Figure 8.2: Population by Age, 1950-2100, Bangladesh



Source: United Nations Population Division

Figure 8.3: Population by Age, 1950-2100, Nigeria



Source: United Nations Population Division

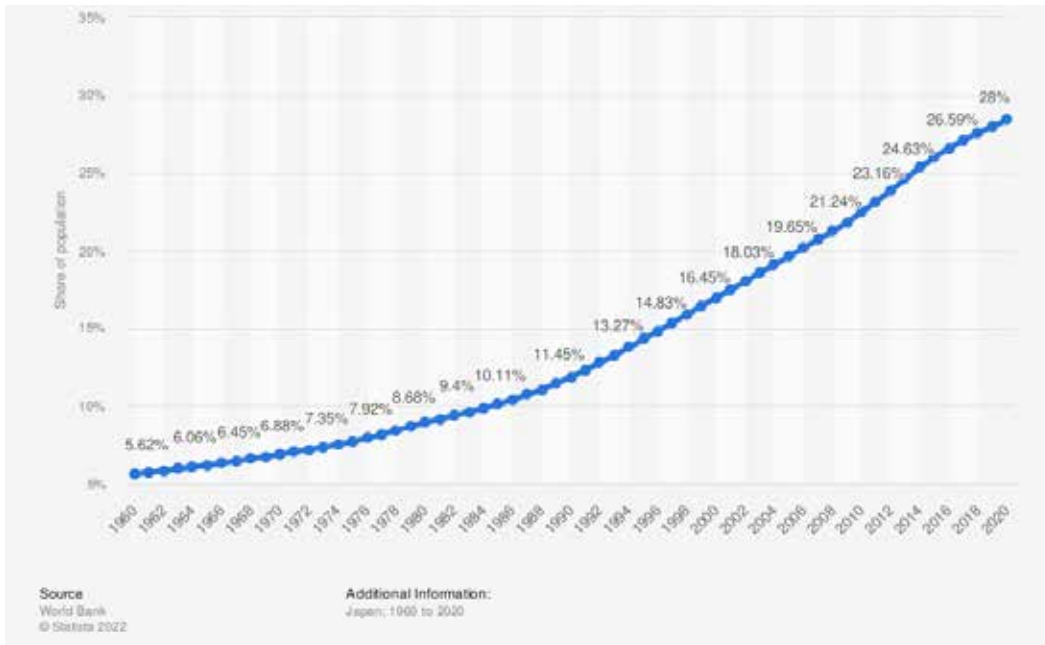
Population aging is often considered to be one of the most important challenges facing societies in the industrialized world. On the one hand, the aging of the workforce is seen as a burden on economic growth and the sustainability of public finances. For example, for every 10% increase in the proportion of people aged 60 or over, the growth rate of GDP per capita decreases by about 5.5%. In the case of health services, the impact of an aging population is the opposite. Health care expenditures will increase in both developed and developing countries in the coming decades. In developed countries, acute care and institutional long-term care services are widely available, use of medical care services by adults increases with age, and per capita health care expenditures are relatively high for the elderly population. Thus, the rising proportion of older adults puts upward pressure on overall health care spending in developed countries, although other factors, such as income growth and advances in medical technology capabilities, typically play a greater role.

A significant portion of the health care costs associated with aging occurs about a year before death. As more people live into old age, the high costs of extending life are being shifted to older and older ages. This section will explore the health care systems of three countries - Japan, Nigeria, and Bangladesh - to identify the contributions and challenges faced by the three countries with respect to health care spending in old age and provide recommendations.

## 8.2. Japan

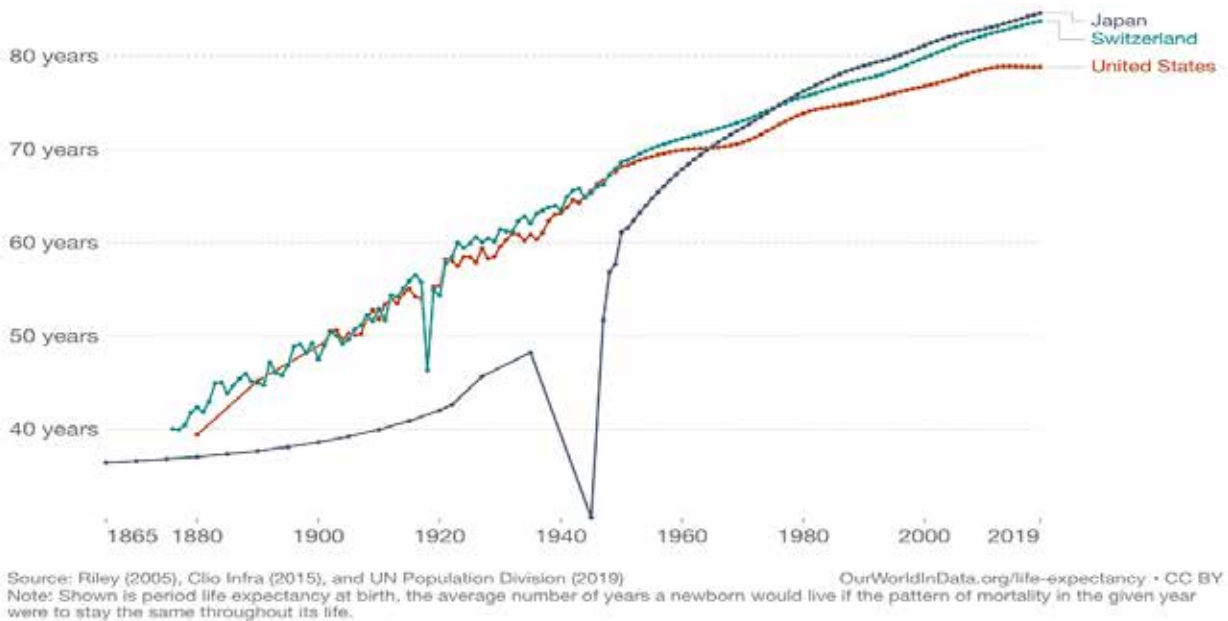
According to internationally recognized standards, an aging society can be regarded as one in which the elderly population over 60 years old or 65 years old exceeds 10% or 7% of the total population (Nations, 2019). In the past half century, aging in Japan has been developing rapidly among other countries in the world. It can be seen from Figure 8.4 that in 2020, the elderly population over 65 years old in Japan has accounted for 28% of the total population, which is far beyond the internationally recognized standard of aging society. Figure 8.5 shows that in 1998, the average life expectancy of Japanese people was 77.2 years for men and 84 years for women, which has reached the highest level according to the World Health Organization and has held the record of the world's longest-living country ever since. With the aggravation of the aging of the population, the number of the elderly population in need of healthcare in Japan is increasing, and the elderly care tends to be long-term. In response to the trend of accelerating aging and guarantee the quality of life of the elderly, Japan has implemented medical insurance and long-term care insurance. The advance of aging society promotes the development and improvement of the senior healthcare service system, the government gradually increases the investment in the senior healthcare field. However, the social and economic burden in Japan is gradually increasing.

Figure 8.4: Percentage of people aged 65 and older in Japan from 1960-2020



Source: World Bank, Statista

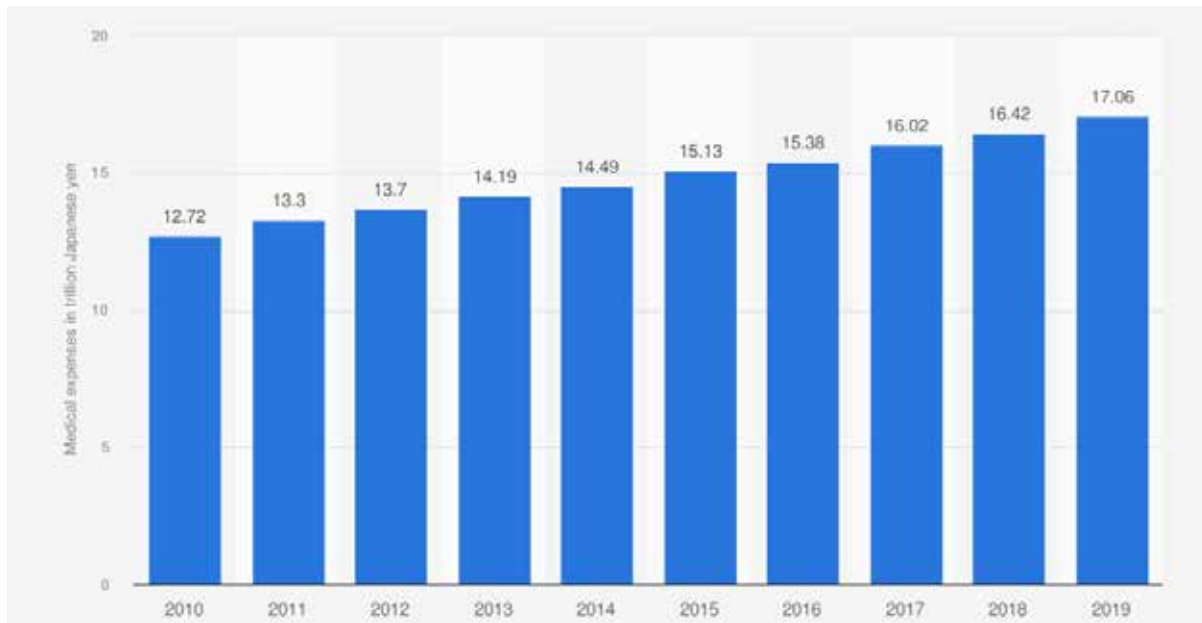
Figure 8.5: Life Expectancy in Japan from 1865-2019



Source: Riley (2005), Cilo Infra (2015), UN Population Division (2019).



Figure 8.6: Annual medical care expenditure in Japan from 2010-2019 (JPY trillion)



Source: MHLW, Statistics Bureau of Japan

### 8.2.1. Senior Medical care insurance

The current medical security system in Japan originated from the National Health Insurance Act issued in 1961 (Kobayashi, 2009). The implementation of the National Health Insurance system has realized the goal of insuring all Japanese people. Anyone living in Japan is required to have healthcare insurance, and national health insurance coverage of more than 99% is a compulsory basic insurance system. Japan's medical insurance for the elderly is mainly aimed at the aged over 75 and those aged 65 to 75 with certain disabilities. Specifically, 40% of medical expenses are subsidized by health insurance and 50% are subsidized by public finance, only 10 percent of his or her medical expenses will be paid by the individual, including in-patient and out-patient treatment, food and living expenses (Matsuda, 2019). But senior people with an annual income of more than 3.7 million yen, 30% of his or her medical expenses will be paid by the individual. The medical system for the elderly in Japan is different from the traditional medical insurance system in the past. In the past, the husband undertook the payment of the medical insurance premium for the whole family, and the family paid the contribution, while in the medical system for the elderly, the individual pays the insurance premium according to the same standard.



### 8.2.2. Long-term care insurance

The Long-term care insurance in Japan provides senior people with physical and psychological help, support them mainly takes the form of care institutions, supplementary health care institutions, adult day-care services, home care services and hospice care. Japan currently implements government-led care insurance and supplemented by family care. Japan achieved universal health coverage of health care by enrolling a national Health Insurance system in 1961 (Ikegami, 2019).<sup>13</sup> When the LTCI system was introduced, the Japanese Ministry of Health, Labor and Welfare identified four key goals of the system (Yamada & Arai, 2020)<sup>14,15</sup> (Iwagami & Tamiya, 2019).

The benefits of the Japanese public LTCI system are mainly reflected in the provision of family services and institutional facilities. Everyone over the age of 65 is eligible, as are people between the ages of 40 and 64 with related conditions such as disability, which is based on suitability rather than income or assets and is reassessed every six months (Ministry of Health, 2002). To qualify for LTCI benefits, individuals must go through a lengthy disclosure process. Infrastructure of the services available only to authenticated by the committee of experts need LTCI customers, long-term care certification standard is a unified national recognition, when a person is proved to need long-term care, the need according to the degree of health, welfare rights of different corresponding to each nursing level, and the services provided by the cross-regional may be different. The LTCI system provides two types of services: the first is home care services, which include daily home visiting services, short-term services or nursing, home medical management consulting and Alzheimer's care services, for-profit private housing for the elderly with medical services, allowances for the purchase of welfare equipment and home decoration allowances; The second is facility services, which provide long-term health care facilities for the elderly, sanatorium-like wards and wards for dementia patients and hospitals that enhance the provision of long-term care services.

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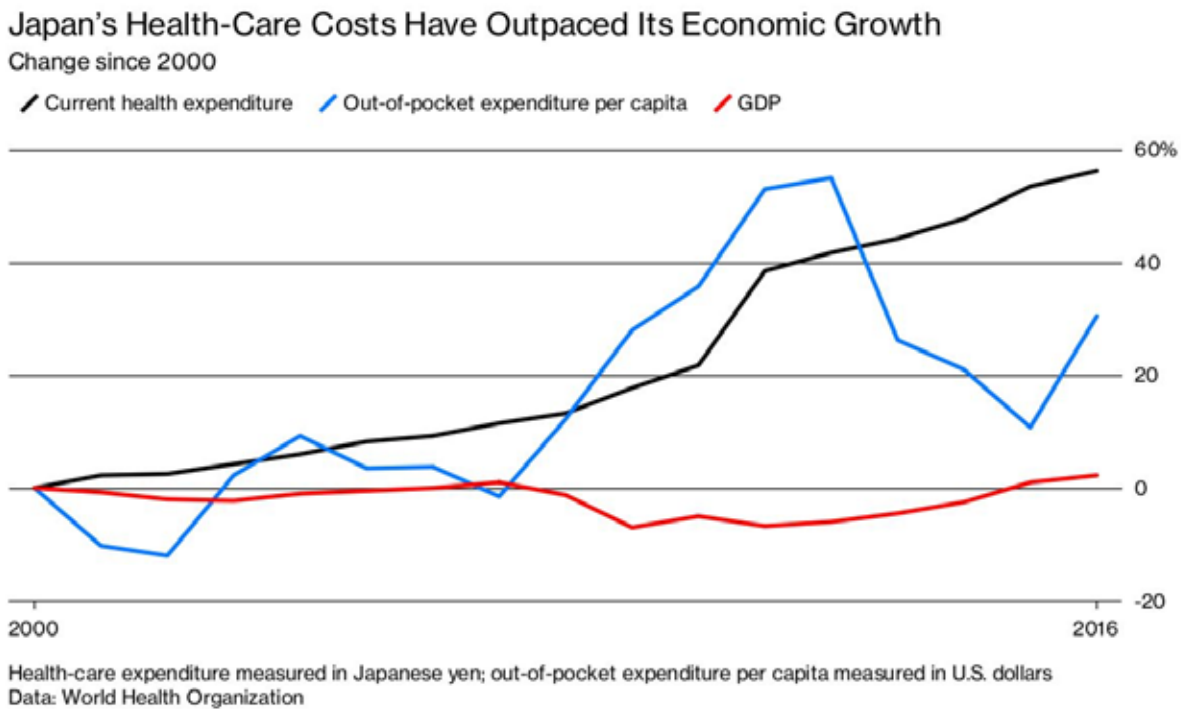
<sup>13</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7533196/>

<sup>14</sup> <https://www.mhlw.go.jp/english/topics/elderly/care/2.html>

<sup>15</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7930803/>

### 8.2.3. Financial Challenge

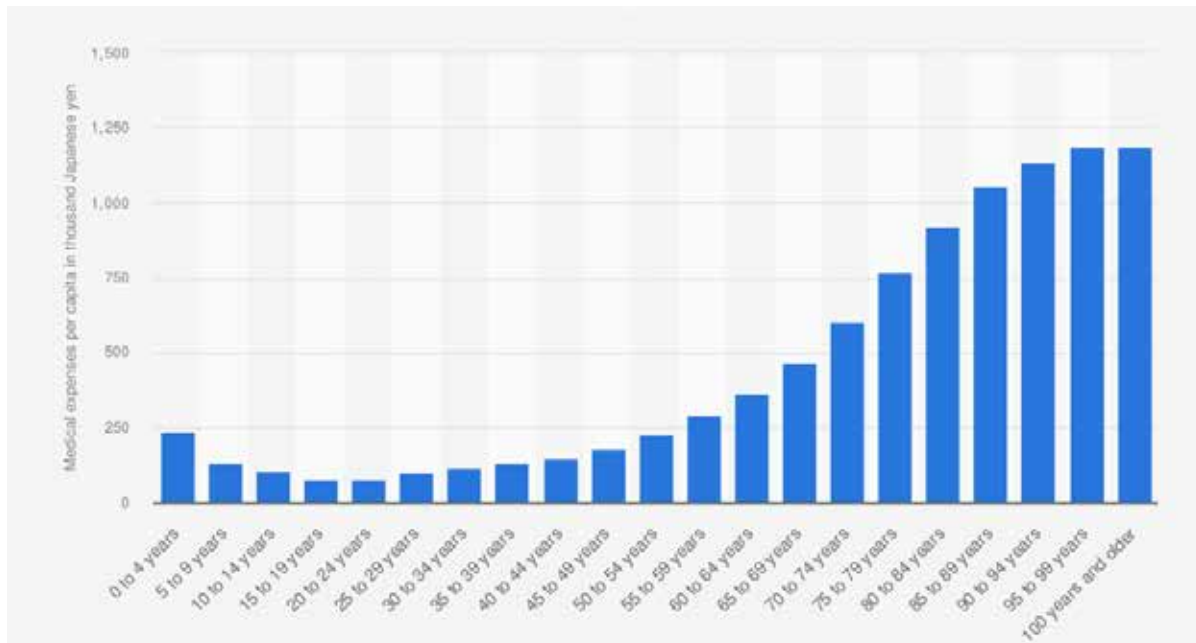
Figure 8.7: Japan's Healthcare Costs in Japan from 2000-2016



Source: WHO, BQPrime

Increasing aging population, high longevity, and low birth date in Japan lead to costly and unsustainable healthcare system. It seems like Japan has a perfect health insurance system, which provides citizens with high-quality medical security. However, the government bears the high medical expenses, which caused a crisis of medical insurance fund. Japan's medical deficit has a long history, Figure 8.7 shows that the annual health spending grew even 40 times faster than the GDP from 2000 to 2016. Economic downturn leads to weak upward tax revenue, fiscal expenditure pressure is expected to further increase, will affect the expenditure of social security costs. Financial pressure is the main problem that Japan's healthcare system facing at present.

Figure 8.8: Average medical care expenditure in Japan in 2018, by age group, JPY trillions



Source: MHLW, Statista

In addition, another problem of Japan's medical insurance is the high proportion of medical expenses for the elderly. In terms of the age level of medical expenditure from Figure 8.8, in 2018, the Per capita national medical expenses in Japan were over 700,000 yen for those over 65 and less than 200,000 yen for those under 65. The average person over 65 spends more than three times as much on health care as the average person under 65. The senior healthcare policy aims to ensure that the elderly treated well in their later years, but the low expenditure by senior people encourages them to frequently visiting hospitals and most of the hospital beds are occupied by the elderly. The system was designed to favor medical treatment over prevention and health care, resulting in even more serious financial problems. Many elderly people go to hospitals instead of nursing at home. The long-term fiscal deficit caused mainly by the senior health insurance industry will eventually force the government to raise the price of health insurance, which lots of elder consumers may be unable to afford or unwilling to buy. While more and more people are unable to afford medical insurance, government are forced to offer more financial help to those who needs it, which in term dramatically increase the country's financial burden.

#### 8.2.4. Labor Challenge

Despite the high demand for services, human and financial resources, as well as government restrictions on new facilities, keep potential residents waiting for long periods. Residents of the

largest and most populous urban areas will face the greatest shortage of care facilities as older residents are expected to increase. The Ministry of Health, Labor and Welfare forecasts a labor shortage of 300,000 by 2025 (Ministry of Health, 2015). Low wages have led to fewer workers in the healthcare sector, and the MHLW has had to come up with various measures to address this problem. Attitudes to expanding the Labor market to accommodate careers from other Asian countries are changing. In 2008 and 2009, Japan signed trade agreements with Indonesia, Philippines, and Vietnam to increase the number of workers in those countries (Japan, 2022). The impact of senior healthcare system on caregiver burden has yet to be widely assessed. Factors that may influence caregiver burden include service availability, community involvement and emotional support.

#### 8.2.5. Social challenge

There are proposals to create private insurance companies to relieve the government's financial burden. Such a proposal would be hard to implement in Japan. First, it is difficult for consumers to know exactly the true cost and risk of private insurance institution. Second, if there is no government involvement in controlling the private insurance market, and those who participate in public care needs go to buy private insurance, private insurance companies may secretly bid up prices, which will lead to higher average premiums for the entire market; Finally, private institution costs are often enormous, and many seniors cannot afford such insurance. If they need private insurance institution protection, seniors may be forced to sell their homes and spend all their assets.

#### 8.2.6. Solutions

Due to the rapid aging of Japan, the serious number of children, the significant decrease of labor force and the increasing demand for nursing staff, the quantity and quality of personnel engaged in healthcare industry are very worrying. In terms of increasing the number of professionals, the government can specify policies to make healthcare an attractive career for young people through programs such as increasing existing benefits. At the same time, it is essential to consider the integration of medical and nursing industries to ensure the number of employees. At present, most of nursing workers in Japan are young women. In the future, we may consider introducing more male staff or even elderly staff. In terms of improving the quality of employees, the professional education and training of employees should be strengthened first, and the enthusiasm of employees and service quality can be improved by appropriately raising the salary and treatment of high-quality workers.

The government can strengthen investment in preventive health care and take measures to rationalize medical expenses. The root of reducing the number of elderly patients is to prevent disease as much as possible. In preventive health care, making full use of health big data, paying attention to personal health management and promote national health management. In addition, the government regularly carries out free health lectures for the elderly through

cooperation with large medical and health institutions or well-known healthcare experts in Japan, and at the same time carries out network broadcast to ensure that more elderly people across the country watch professional health lectures and strengthen the prevention of senile diseases and chronic diseases. At the same time, health care for the elderly can be carried out nationwide, with activities for the elderly as the center, and measures such as nursing and prevention, home-based health care programs, prevention of diseases caused by living habits, and prevention of severe diseases can be implemented in a coordinated manner.

In addition, the government can actively encourage civil participation in geriatric care services. Not only non-profit organizations such as governments and social service groups get in this industry, but also encourage more experienced volunteers and other local private healthcare services get involved. Social forces into elderly care industry can not only help ease the pressure of the lack of government funding and equipment, better and more fully meet the diverse needs of the elderly, but also in terms of cost control and quality of service industry competition mechanism can be formed, while minimizing costs, provide more efficient and quality service to the elderly. At the same time, it can also promote the development of the private enterprises and make the healthcare industry in Japan growing larger and broader.

### 8.3. Bangladesh

The current health care system in Bangladesh places a tremendous financial strain on the elderly population. According to the latest health bulletin from the Ministry of Health and Family Welfare of Bangladesh, people are expected to start living longer and this demographic nature is causing influence among policy makers, healthcare management levels and the public health sector as it will have an impact on the rising cost of healthcare. The important utilization efficiency of health care services usually depends on the performance of targeting specific groups and specific health issues within overall health care spending, such as the amount of money and social resources spent. Health care spending is strongly dependent on age, and the effects of aging are increasing over time as younger generations from large population bases enter old age.

#### 8.3.1. Current Aging Health Care System

The Government of Bangladesh has endeavored to establish a network of health care systems and has established the constitutional obligation of the state to provide medical coverage to the people after the introduction of the National Health Policy. However, the lack of medical equipment in the basic entities and the shortage of health care providers has led to the lack of policy implementation (Rahman,2006). This has made it more difficult for the marginalized elderly population to access health care coverage, even though they are more in need of medical protection than the younger population.

After the first announcement of the National Health Policy in 2000, Bangladesh enacted the Maintenance of Parents Act in 2013 for the elderly population, an important piece of legislation that guarantees basic necessities and basic livelihood security for elderly parents (Sarker, 2021).

The enactment of this legislation responds in part through specific regulations to the Implement the National Policy on Older Persons, which was enacted in the same year. The announcement of the National Policy establishes the importance of the rights of older persons at the national level, with the intention of making it possible for marginalized older persons to be taken into account at the welfare level. The policy also states that it is a fundamental obligation of the State to guarantee the rights of the elderly to enjoy their fundamental rights.

They were followed in 2017 by the reorganization of the National Committee on Older Persons and the development of the International Plan of Action on Aging. A series of actions that first legislated the general powers of older persons at the structural level of government, complementing the legislation on older persons. The gender/disability provisions in the legislation on older persons. The development of specific national policies and action plans and complementary and complete budgetary allocations are the result of the policy-making level. Also, at the social welfare level, social welfare measures such as ID cards, health cards, and exclusive services for the elderly according to the policy are used to stimulate and attract the participation of various operational sectors (Sumaiya, 2014).

Although a social support framework for the elderly has been developed, in practice, the rights of the elderly community are not widely guaranteed, and this problem arises in the critical aspects of concrete implementation. 2013 Implement the National Policy on Older Persons, although recognized by the state at the policy-making level, lacks a specific supporting legal framework and the lack of information exchange between the relevant sectors (Ferdousi,2020). Most older adults and service provider authorities are unaware of the policy, and the implementing authorities are not making it operational. There are also no national initiatives to develop infrastructure specific to the elderly population. Public transportation, housing, primary independent health care and hospitals, airports, public areas, etc., are not further optimized and improved for the elderly population. The governmental initiatives for elderly benefits are limited, although there are different social subsidies such as pension systems, retirement benefits, and development subsidies for vulnerable groups. However, a large number of the elderly population remains outside the scope of these programs due to their working status. The government has post-retirement pension benefits for the elderly in the government sector but employed private-sector workers and mobile older workers are not entitled to any pensions (Sumaiya, 2014). Moreover, they do not have access to pension status under existing laws. The possibility of this segment is not covered and protected at the regulatory level for these particular groups.

### 8.3.2. Cultural impacts

Maintenance of Parents Act in 2013 as one of the regulations that support the survival of the elderly in society, it is unique compared to other countries. The Act can be regarded as a milestone in the field of the rights of the elderly in Bangladesh, and it establishes the obligation of the family to support and provide for the elderly (Sakib,2021). However, there are many loopholes in the law such as the regulation of adoptive parents, parents without children,

parenting norms and limits on the amount of support for the elderly without the authority of government intervention. The existence of this law proves the importance of the responsibility of children to support their parents in Bangladeshi culture. As an Asian country, Bangladesh has a long cultural and religious tradition regarding the idea of family integrity and the blame and bondage between family members, and the elderly expect their families and communities to take care of them until they pass away. Adult children, especially sons, are considered the primary source and reliance for family security and financial support, especially in times of disaster, illness, and care for the elderly. The culture claims that the absence of an adult male child in the family is seen as a material loss (Cain, 1986). Sons constitute an important source of heart insurance against the risk of insufficient income in old age and various other contingencies.

However, with globalization, the invasion of Western culture has brought a new cultural impact to a new generation of Bangladeshi residents and even weakened the influence of traditional systems in the family. Rapid socioeconomic and demographic shifts, mass poverty, the weakening influence of changing social and religious values, and other factors have disrupted traditional extended family and community systems of care. Traditional family structures have undergone increasing changes from the previously common extended family, with large populations gradually transitioning to nuclear family size, and younger generations of parents gradually easing the pressure of parenting older parents as they take on the responsibility of their children's education and development.

The size of such families will shrink in the future, and if Bangladesh policy continues to hand over the responsibility of raising the elderly to the younger population, it will create a serious skewed responsibility for an aging society in the future.

*Box 4: A Primer on Dependency Ratios*

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Young Dependency Ratio (YDR)

The young dependency ratio is the number of persons 0 to 14 years per hundred persons 15 to 59 years.

Old-Age Dependency Ratio (OADR)

The old-age dependency ratio is the number of persons 60 years and over per one hundred persons 15 to 59 years.

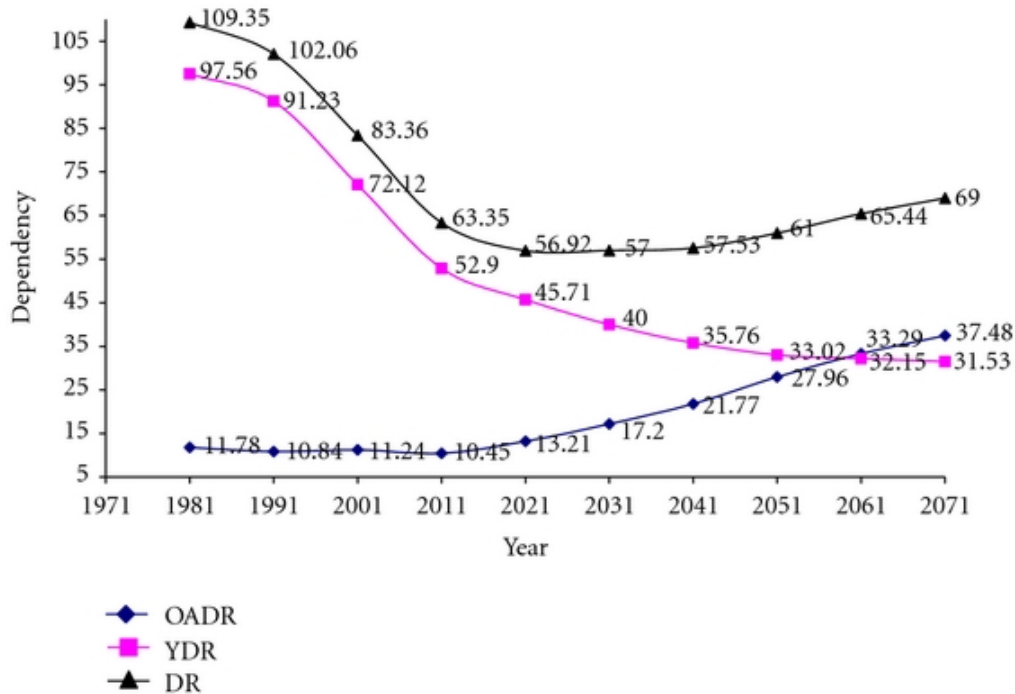
Total Dependency Ratio (DR)

The total dependency ratio (DR) is the number of persons under age 15 plus aged 60 or older per one hundred persons 15–59. It is the sum of young dependency ratio (YDR) and the old-age dependency ratio (OADR).

The above three indicators were used to explore the manifestation of elderly dependency in Bangladesh, which is defined as being an older person who produces less value than they

consume and is dependent on the support of others in society. To avoid data complications, the given output data are only the labor production held by working-age adults. From Figure 8.9 it can be seen that Bangladesh is reaping a demographic dividend from its aging process in the earlier period due to the cultural base support, and this income enjoyment will continue in the first 30 years of this century. Because younger dependence will decline faster than older dependence increases, leading to a decline in total dependence patterns, fewer and fewer younger people can take on the social dependence of the older population, which is something that aging societies will generally face. Moreover, in Bangladesh, where the existing system allows the cost of living for the elderly to be paid by the family, how will the elderly population survive in society when the younger population cannot continue to pay for the expenses of supporting the elderly in the future with the advent of an aging society?

Figure 8.9: Aging measures of Bangladesh population, 1981–2071.



Islam, 2012

### 8.3.3. Challenge

Traditional families who originally relied on cultural influences are predicted to be unable to sustainably afford health care expenditures for the elderly. Older adults are defined as being of retirement age after age 60, and less than one-third of that population is able to receive a pension under labor force status (Alamgir, 2022). Although Bangladesh has established pension compensation and corresponding sectoral medical benefits, however, for a country with a large



percentage of laborers where 50% of the working population is agricultural workers. The majority of the population is unable to meet the benefits of the pension and health insurance system. Even the government and most of the uneducated elderly are unaware the public services available for them.

The challenge in Bangladesh in the area of health care for the elderly is not only the difficulty of payment for the elderly, but also the lack of health care facilities and amenities is one of the reasons for the difficulty in accessing health care for the elderly. In particular, there is a growing number of elderly people in rural and semi-urban areas with a large share of the population and in areas that do not receive the benefits associated with old age well-being have inadequate health care facilities (Abdullah,2018).

Bangladesh's healthcare institutions are significantly underserved in terms of universal access to the elderly population nationwide. Although government agencies set up some institutions, they tend to be located in urban zones, giving access to specialized medical services to elderly people in urban areas who can afford to pay. And this type of population is only 20% of the urban population. In rural areas, where the concept of health care is not widespread, older people are unconcerned about being sick (Hossain, 2006). However, their dependent families do not see the need for medical care for the elderly because they are located on the margins of society. Most older adults and their families are not aware of these services. Agencies that provide medical services to the elderly are often privately owned and for-profit and high charge fees for their services, keeping those who cannot afford to pay away from these facilities. The overall system also lacks skilled human resources to care for the elderly, most of whom lack expertise. The technical aspects of health care and the scale of work in health care services are very limited in Bangladesh. In Bangladesh, more attention needs to be paid to the entire health care system to improve the health care system in order to reduce the pressure on society as we enter an aging society in the future.

#### 8.4. Nigeria

Nigeria's health system has been weak, dysfunctional, and inequitably distributed for decades. In the previous chapter, it is evident that Nigeria's overall national health care system and the establishment of the delivery system are flawed. It is not universal, and the government sector does not directly employ even young adults who are not entitled to benefits such as social security and health insurance. In the absence of state-provided elder care services, the family becomes the only existence that the elderly can rely on, and the family is responsible for ensuring the survival needs of the elderly.

In Nigeria today, there is a lack of establishment and implementation of social security policies for the elderly and a lack of awareness at the government level that the elderly is a group that needs attention. Under the influence of long-standing culture, government departments also consider the care of the elderly group as the responsibility of the family of origin rather than the government (Tanyi, 2018). But with the recent marked decline in the adequacy of material

support for the family and the increasing pressure on the supply of the number of elderly that the family needs to support due to the decreasing size of newer families and the increasing aging, there is a growing need for social security policies for the elderly in the family unit.

#### 8.4.1. The responsibility of caring for the elderly

Traditionally, in most African communities, caregiving as family support is a reciprocal activity involving children and adult children and their spouses. However, the pressure on families in the face of the increasing number of older adults is enormous.

The increase in the number of older people in Nigeria is largely due to declining fertility rates that have been declining since the 1980s, with fewer children being born, resulting in a previously large middle-aged population becoming older over time. The new step of the youth population becomes skewed in comparison to the population distribution due to the declining birth rate. Global aging is inevitably occurring, and in Nigeria it is occurring against a backdrop of socio-economic hardship, widespread poverty, epidemics such as HIV, and rapid shifts in traditional extended family structures (Adebanjoko and Ugwuoke, 2014).

The original responsibility of caring for the elderly was the family of origin under the influence of its cultural traditions, however, it is believed that family support systems in Africa have shifted, and people's thinking has changed with formal education, religious influences, etc., with the arrival of colonialism in the late 19th century, the spread of Christianity, formal education, and the subsequent rural-urban migration movement. As the impact of modernization in Africa created new living conditions for the new generation of people, the new migrants in towns were subjected to the pressure and burden of the demands of care obligations more than before. Continuing to assume caregiving responsibilities for the extended family has led to a culture in which support for the elderly has gradually become asymmetrical rather than the reciprocal behavior it once was (Tanyi, 2018).

One of the ultimate reasons why the elderly become a burden to the family is the inability to provide financial support to the family, which is related to the social security policies that older Nigerians do not access (Jenkel, 2007).

Recently reformed contributory pension plans (insurance) beneficiaries do not include many seniors. This pension plan, equivalent to PHC, primarily covers people working and retiring in the formal sector. This scheme has many limitations, and the lack of social pensions has a severe impact on the basic security of life of the elderly. The fact that seniors at the age of 65+ cannot continue to work for their living costs due to natural aging of the body and are not covered by the contributory pension scheme means that they are left without any income beyond the retirement age and are dependent on their families for support. This, combined with difficulties in accessing health care and other essential services, has led to a growing number of older people facing deprivation and poverty.

Older adults face economic, social, family and political exclusion in a variety of responsibility-shifting situations.

#### 8.4.2. Challenge

In the face of the severe social inequities in health care treatment received by the elderly, the author believes that the most challenging and priority issue to address should be the prejudice against the elderly in society itself compared to research in the field of health insurance (O'connell,2015). This issue is not only a cultural influence squeezed by the society itself, but also a direct gap at the policy level for this field. The government should also assume the primary responsibility of paying for the needs of the elderly.

And a major challenge for the government is to develop officials with a high level of implementation and relevant understanding and knowledge of how to respond to the complex needs of an increasingly aging population. One of the problems facing countries that are lagging behind in development is that the government of that country does not have the foresight to improve in time for the changes in today's society. Nigeria, despite being the most populous country in Africa, is still highly dependent on international organizations for funding and operating systems in many sectors.

In the current situation, the rapid management and resettlement of large populations in the country requires outside help, but the management models and support funds given by outsiders often do not meet the needs of the actual society.

With a strong national economic system as the only pillar to support the livelihood of the people, during the boom period in Nigeria's history, the government arranged for free health care services (Tanyi, 2018), a service that did require a lot of the state itself to fund social welfare services in order to achieve a full-coverage livelihood service mechanism for the entire population. However, such social services have been repeatedly scaled down in the budget invested in the wellbeing sector after the fall in international oil prices led to the breakdown of the Nigerian national economic system.

Today's Nigerian society is governed by a federal system of government, with a wide disparity between the rich and the poor, making it difficult for the general public to enjoy the benefits that society should give to the people. When it is difficult for people to obtain social security from the state, they look for institutions that can guarantee the public good, in order to achieve the will of self-protection and self-care.

Furthermore, often these institutions are non-government managed, privatized or voluntarily managed mechanisms in which people are not treated fairly in terms of basic livelihood protection, and their costs are built into the input funds of the residents (Unanka,2002). This is why the group of elderly people who have access to superior health care coverage and treatment is often the wealthy one, and the percentage of patients receiving treatment is significantly higher in cities than in rural data.

Society's challenges for older adults also include the presence of gender discrimination. Older people are already marginalized in terms of lack of social support and linkages, yet female roles in the Nigerian elderly population have even lower social status (Ekoh,2021). The results that were evident in the self-awareness study of the elderly indicated that older men felt a sense of importance and respect in the community, and that only men were allowed to be present at extended family meetings. While female respondents indicated that they do not have the right to make decisions in the family and are not allowed to participate on the grounds that for men, women do not have a higher status in the family and cannot provide useful advice, further preventing women from participating in all things political and social affairs in social life.

Such discrimination has existed for generations and has had a lasting effect on people, with many older women saying they have not had the right to study or work since childhood. In the context of the Nigerian health care system, the key to participation in PHC is having a job, which results in many elderly women not having any financial resources to support their needs at the age of 65+ or even earlier. This exacerbates the dependence of female elders on their families in cases where they are unable to meet government-supported aid status.

Social stereotypes and lack of government functions are the most serious problems facing Nigeria's growing elderly population in the future (Tanyi, 2018). This has resulted in their inability to participate and enjoy the WHO right of access to health care for all. In contrast to Bangladesh, Nigeria needs to make bold changes in government policy making and conceptualization to target the elderly and redefine the importance of their role in the society.

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## 9. Infrastructure & Aging Economies

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*Lydia Zoe*

Infrastructure serves as the backbone of a country's economy – it is the set of fundamental facilities that hold together a country's economy and allows for the movement of goods, services, people, and ideas. It connects individual households to a myriad of resources within metropolitan areas and higher quality opportunities for employment, healthcare, and education.

By viewing infrastructure as a means of providing support to an aging population, this section explores the current healthcare infrastructures and policies within Japan, Bangladesh, and Nigeria. This discussion will revolve around the idea that programming and facilities can improve aging in place and quality of life.

The concept of aging in place grows from the need to allow older adults to remain in their homes or allow them to live their final years in supportive and adaptive environments. This translates to environmental spaces and homes that aid in the physical movement of the elderly and fiscal policies that promote or maintain financial independence.

The Urban Renaissance Agency defines the goal of aging in place as "to enable all people to continue living in their familiar environments throughout their lives" (MLIT-PRI & UR, 2020). It is a multi-part equation that consists of (1) voluntary and active neighborhood involvement in community development, (2) conjunction of public and private support that aids in daily living, (3) growth management-focused community development, (4) and access to medical and welfare facilities (MLIT-PRI & UR, 2020). To ensure the success and quality of creating an environment that facilitates aging in place, it requires each of these needs to be addressed and equitably provided. Creating standards not only improves the quality of life for the elderly but also enriches their sense of purpose and responsibility while promoting a new sector of economics and services that views the elderly as much more than their age.

Humans are naturally social beings, and this aspect does not go away as we continue to age in life. As financial resources become limited for the elderly, communities and neighbors become valuable sources in place of fiscal limitations. Volunteers and other community-based support systems greatly benefit individuals who choose not to or cannot leave their homes.

Mixed-age developments and diverse living situations are adaptations to changes in social structures and our world's increasingly diversified needs. This brings up the question of what does elderly healthcare infrastructure look like in societies where traditional family care and structure change? As fewer adults have children – who bears the responsibility for care? Where can government support and healthcare infrastructure lend a hand in this situation? Continuing on with multigenerational development strategies – developing for growing families and families that grow older (MLIT-PRI & UR, 2020).

At older ages, medical checkups and personal health start to take a front-row seat – bringing up the concern of access to healthcare, not just financially but physically. Medical personnel's location and proximity are often an issue in non-urban regions, especially for those without access to a car or lack mobility. Furthermore, addressing rising healthcare costs - what happens when a country has underinvested in the "required resources" for the "underlying foundation" to empower aging – this situation only worsens as government budgets become increasingly exacerbated by aging societies (Kaldes, 2021).

Many of the questions raised will continue to be explored throughout the rest of this report.

### 9.1.1. Cross-cutting issues within other topics

Senior healthcare infrastructure can be expanded across various disciplines and topics. Climate change brings up the importance of building both sustainable and resilient environments and taking into consideration its negative impact on elderly health. Productivity introduces the need for elderly-friendly job opportunities. As aging populations may have a large enough labor force to create an impact on overall productivity within a sector – job opportunities not only aid in preserving a high-quality mental cognitive state but also allows for financial independence and meaningful social interaction. Pensions address financial feasibility for funding the costs of daily living.

## 9.2. Japan

One of the most highly technological and developed countries globally has been tasked with the challenge of addressing its rapidly aging population. Japan has been granted a “lucky moment,” as coined by Ulrike Schaede, with the disruption created by an aging society being offset by the sheer amount of technological advancement, granting the nation a solution to their dwindling workforce. As a result, the government has been able to focus its time on creating the necessary measures in infrastructure, policy, and programs to provide a smooth transition for the elderly.

In a 2018 survey, “more than 90% of Japanese adults aged 65 and above preferred to live at home, and more than half of them also preferred to die at home” (Nakagawa, 2022). This sentiment can be attributed to two cultural aspects: one, where families in Japan share a collectivist culture, where “decisions are shared and made by individuals, families, and clinicians” (Nakagawa, 2022). Secondly, a Japanese phenomenon called *kodokushi*, roughly translated to a *solitary death*. It was first described in the 1980s; this tragic end to life became increasingly frequent with the country's increasing elderly population, economic instability, and "Japan's contemporary cultural habit of ignoring death” (Nobel, 2010). A 2014 survey by the Japanese government showed that "45% of older Japanese who lived by themselves were concerned about dying alone (Runzo-Inada,2020)". Thus, with Japan's elderly population accepting aging in place, its government has created the instruments and infrastructure for high living standards.



This discussion will revolve around two case studies: Tategaoka Housing Complex, which focuses on exploring the success of implementing a counseling room with specific programming dedicated to the elderly population. Secondly, Toyama City's municipal reformation focused on policy implementation, regional care centers, and large-scale government involvement.

### 9.2.1. Tategaoka Housing Complex

The Tategaoka housing complex, located within the greater Tokyo metropolitan area in Hachioji City, is a residential complex under management by the Urban Renaissance Agency of Japan. Over half of its total residential population are aged 65 and over. To cater to its large elderly population, Hachioji City commissioned the complex to establish a center for general services and care called the Furatto Counseling Room. While the City takes charge of operational expenses, it is also partially subsidized by the Tokyo Metropolitan Government (MLIT-PRI & UR, 2020). Moreover, its success can be attributed to the many individuals, neighborhood associations, and university students who partake in the community's activities.

The counseling room was created to provide three main services:

1. To promote social interaction and information sharing
2. To create support activities for the elderly
3. To allow students and elderly residents to interact together

To ensure that all elderly residents are accounted for, the housing complex would provide reports to the counselor in cases of "isolated elderly individuals with serious health or mobility issues" (MLIT-PRI & UR, 2020) to curtail any potential issues arising from loneliness. Free counseling services were provided "in collaboration with city agencies and the UR for further support" (MLIT-PRI & UR, 2020) to address any potential issues. The counseling desk also acted as a multi-faceted resource. It provided education on long-term care and insurance services and connected residents to "appropriate support centers or medical institutions" (MLIT-PRI & UR, 2020). Aides also responded to requests for help from residents with simple repairs or a short check-in. Through these efforts, the Furatto counseling room had successfully created a space and service that "enhanced residents' feeling of safety and security" (MLIT-PRI & UR, 2020) and "communicated with residents to understand and solve problems" (MLIT-PRI & UR, 2020).

Alongside the counseling room was the Furatto café – designated to provide social and emotional support to the elderly and other café visitors. The café was staffed with volunteers and two full-time staff members to keep costs down while still providing quality services. Many of the volunteers were elderly residents within the housing complex, which encouraged opportunities to build friendships while maintaining a safe and inclusionary working environment for those interested (MLIT-PRI & UR, 2020). A bicycle taxi service was implemented to further promote interaction between volunteer university students and older residents. The neighborhood association spearheaded the program to address the elderly's difficulties in shopping, such as limited stamina and strength when carrying heavy grocery bags over long distances. The taxi

service is conducted solely by volunteers, providing a much-needed service at no cost; however, many passengers donate money towards a ride (MLIT-PRI & UR, 2020).

Through the research conducted at the house – residents had reported that visiting the counseling room "provided opportunities to talk and get to know each other," indicating its success in enriching interpersonal relationships between residents within the housing complex. Additionally, its open means of communication allowed to bring light to specific struggles within the elderly community, creating programming geared towards improving quality of life and independence.

As the trend of older adults living in suburban housing complexes continues to rise, the concern is that local communities may lack the appropriate infrastructure and resources to provide comprehensive support. These concerns and challenges would need to be addressed through revitalization and localization of services (MLIT-PRI & UR, 2020). Furthermore, to ensure the success of a community – it would have to provide for not just the elderly population but a multigenerational community that would contribute to the overall revitalization of a place.

### 9.2.2. Toyama City

Taking the case of Toyama City in Japan – located on the main island of Honshu – Toyama is described as a "thriving high-tech city surrounded by and infused with nature" (Runzo-Inada, 2020). Its environment, culture, and history are deeply rooted within the traditional "Japanese sense of nature's sacredness and the centrality of agricultural and rural lands" (Runzo-Inada, 2020). Its elderly group, defined as 65 or older, is expected to account for 40% of its total population by 2045 (Runzo-Inada, 2020). As a response, this City has been preparing for resiliency for several years by designing a compact and efficient city, addressing ways to improve waste management, flood controls, and the challenges of an aging population.

The strategy of making Toyama a compact city focused on three aspects: (1) Revitalizing public transportation, (2) encouraging relocation of residents and businesses to transportation accessible areas and developing city facilities along these corridors, and (3) revitalizing city centers (Runzo-Inada, 2020). By doing so, the City could address several issues: its aging infrastructure, lack of economic resilience, prevent and slow down environmental degradation and stresses caused by extreme weather events, all while continuing to be able to provide and account for its ever-growing elderly population. Their leading solution was the consolidation of their seven municipalities which "increased the scope of responsibility for the administration of the new City... Present[ing] both a management challenge and an opportunity for government efficiency, financial savings [within transportation, physical infrastructure, and city-wide maintenance] and greater resilience" (Runzo-Inada, 2020). This proved to be a success as the number of city inhabitants has been projected to increase from 28% in 2005 to 42% by 2025. By relocating Toyama residents and businesses along main transportation lines, the City has efficiently and successfully provided municipal, infrastructure, and transportation services to all urban, suburban, and rural areas.

However, Toyama's path towards complete resiliency does not stop there. The City's most significant challenge focused on its aging and declining population and its stresses on its "social, financial, and infrastructure systems" (Runzo-Inada, 2020). Declining physical aptitude and difficulty navigating traditional bus lines discourage elderly citizens from going outside. Coupled with the naturally occurring isolation of elderly through losing lifetime partners, friends, and distant nuclear families, their overall health decreases, leading to increased healthcare costs. While overall rising healthcare costs can be attributed to a growing elderly population, there was a need to develop higher quantity and quality facilities and medical access. As such, two care centers were developed: the Kadakowa Preventative Care Center and the Comprehensive Care Center. The former utilizes natural hot spring water for Aquakinetics and Physical and Hyperthermia therapy center (Runzo-Inada, 2020), specifically catered to the elderly through meaningful programming that combines the cultural aspects of Japan and health benefits associated with hot springs. The latter serves as a dedicated care center for senior and young disabled children, serving a dual purpose as a daycare center for working mothers. This private-public partnership allows it to serve the community while providing adequate programming for its multi-use facility.

### 9.2.3. What is next for Japan?

These case studies compare to situations in Denmark – whose government has shifted its institutional landscapes to support active aging. Denmark's Structural Reform of 2007 provided a foundation for regulating and developing adequate support systems at national and local levels (Evans, Nistrup, & Pfister, 2018). Through decentralized practices and re-territorialization of healthcare provisions, the country has maintained fiscal responsibilities while placing delivery at a municipal level – thus avoiding limitations in the range and quality of welfare services.

Toyama City is a hallmark case study of a city that had taken the time to identify its weaknesses and challenges and, in turn, create an efficient, elderly-focused, resilient city. By consolidating and improving current physical facilities, the City has naturally developed resilient infrastructure to withstand climate change and extreme weather events while addressing the concerns of its aging facilities. Through municipal consolidation, Toyama's government has effectively reduced healthcare stresses and costs spread upon multiple facilities and, in turn, provided improved access to transportation, social interaction, and healthcare services.

To take the scale down to a micro-level of elderly housing, the Tategaoka Housing Complex has demonstrated the need to create in-house support activities and healthcare services to improve social isolation and mental distress rates. The mix of private funding and public initiatives has allowed for continuous support for elderly residents without limiting the quality of care. Like Denmark, the housing complex has provided opportunities for its elderly residents to act as both consumers and volunteers within the program, thus empowering them "to define meaningfulness in activities... as active community members" (Evans, Nistrup, & Pfister, 2018).

As can be seen, this decentralization of power to a community level is active in both Japan and Denmark – but it is important to note that shifting responsibilities does not mean a lack of communal interaction. The Gentofte Model in Denmark revolves around policy design and creation around community interaction (Evans, Nistrup, & Pfister, 2018). By creating smaller task committees within the design process, councilors can facilitate conversation and identify specific needs brought up by residents – thus further democratizing the governance process in municipalities. Japan's collectivist culture may greatly benefit from this community interaction and hearing model. Creating the space for adult residents to communicate and express their concerns or feelings would increase their quality of life and prevent concerns arising from *kodokushi*.

### 9.3. Bangladesh

As an Asian country deeply rooted in traditional family roles – Bangladeshi families and communities were expected to provide the role of healthcare infrastructure for their elderly population. However, globalization, and rapid socio-economic and demographic changes, have started to break down the "traditional extended family and community care system" (Islam & Nath, 2012). Additionally, due to these strong family bonds and a high value placed on social capital, older adults are often resistant to institutionalization and moving away from the nuclear family. Moreover, the government's lack of meaningful fiscal and health support prevents the means for independence, especially in rural areas. This has left much of Bangladesh's aging population in a state of ill-preparedness and lack of resources. Although the government and NGOs have undertaken a few initiatives, efforts do not reach country-wide to all elderly populations of Bangladesh and continue to lack defined provisions for housing and rehabilitation (Farzana & Malaker, 2019). Currently, the main issues that prevent the way for proper healthcare infrastructure support are

1. cultural unwillingness for institutional care resulting from patriarchal and traditional practices,
2. lack of alternative financial support, and
3. social health challenges derived from differences in urban and rural areas.

#### 9.3.1. Cultural Challenges

In a 2019 survey, Farzana recorded that 86% of older Bangladeshi adults were not receptive to institutional care, and only 12% open to going. This was surmised that much of the older population would rather live out the rest of their years with immediate families.

A 2006 study conducted by Khan indicated that most elderly prefer living with their grandchildren, citing that many grandparents "play with their grandchildren and about 78% of grandchildren also care for their grandparents". Even though quality of life issues could quickly be addressed through institutional housing, many participants indicated that their needs would be better met through modifications and accessibility customizations in their family homes

(Farzana & Malaker, 2019). Additionally, the studies further insinuated that family-oriented living arrangements are "favorable for their overall well-being... [and being with family provided] a reliable source of [emotional and physical] assistance and support" (Khan & Leeson, 2006).

Furthermore, this resistance to leaving the nuclear family can also be attributed to Bangladesh's patriarchal society and culture of filial piety. Adult children are viewed as assets capable of providing security and economic support to their aging parents. This dependency is more often placed upon male children for two reasons: the absence of educational opportunities for female children and, therefore, lack of economic opportunities (Farzana & Malaker, 2019). The past few years have seen a rise in education and job opportunities for females, increasing familial dependency upon female children (Farzana & Malaker, 2019).

However, the traditional family role of elderly support has slowly started to degrade with the increasing rate of younger generations departing nuclear households to pursue better economic prospects. Though economic development is spurred on by smaller family sizes (Kmietowicz 2002), it continues to "pose a greater challenge for... aging population[s]" (Farzana & Malaker, 2019). As such, dependency upon children remains a challenge towards openness towards policy and infrastructure dedicated to aging in place.

### 9.3.2. Financial challenges

With an aging population comes the increased fiscal demand upon the government to provide care for income support, health, and social services (Islam & Nath, 2012). Bangladesh's aspirations to provide for its elderly population have always been evident, going as far as to write a "Provision of Basic Necessities" for the elderly in its constitution. The provision describes an adequate standard of social security to be provided for aging adults, including clauses on "social security... in old age" (Barikdar et al. 2016).

Recently the Bangladesh government has announced a universal pension scheme from the fiscal year 2022-23 (Khatun, 2022). While this comes at an opportune time, several fiscal challenges need to be addressed to implement the pension successfully. Some of the most prominent issues are the lack of accountability and good governance – where corruption, bribing, and lack of revenue collection efforts plague current projects and allowance programs. An old age allowance was introduced to Bangladesh in 1997 to ensure socio-economic development and social security for the elderly (Farzana & Malaker, 2019). Its inception was to grant non-working elderly adults financial independence, raise quality of life, and ensure mental stability. Unfortunately, the allowance system's reach was only so far – the amount distributed was too nominal to provide financial solvency and primarily directed toward those in severe poverty (Farzana & Malaker, 2019).

Meanwhile, about 40% of the population continues without any kind of pension or old age income (Khatun, 2022). As mentioned earlier, while family members often supplement the lack of fiscal government support for many elderly Bangladeshis, most elderlies do not view

themselves as a burden (Farzana & Malaker, 2019). However, this was only the case for those who had additional sources of income, such as savings and homeownership – indicating existing financial capability and independence. Elderly populations who were not as affluent viewed themselves as a burden, demonstrating a strong negative correlation between homeownership and 'feelings of burden on family' (Farzana & Malaker, 2019).

### 9.3.3. Social Health Challenges

As a developing country, there is a stark contrast in opportunities, quality of healthcare, and physical infrastructure between rural and urban areas of Bangladesh. Additionally, rural-urban migration has left older people behind in rural areas, increasing vulnerability and exacerbating feelings of loneliness (Kahn & Leeson, 2006). Moreover, marriage status, positive emotional relationships with adult children, and elderly-friendly and safely navigable environments are all factors that contribute to the challenges of socially aging in place.

Studies on elderly gender ratios indicated that women are more likely to be widowed for a multitude of possible reasons: (1) the traditional age gap between husbands and wives (Khan & Leeson, 2006) and (2) the rapid aging of the male population in comparison to female (Islam & Nath, 2010). Feelings of loneliness at older ages become further entrenched through widowhood and adult children becoming busy with their own families. Emotions of burden intensify as many elderly were once working adults, providing for their household. Cultural barriers and stigmas towards remarriage often prevent the elderly from seeking like-aged partners, especially with the risk of potentially harming an older person's relationship with their adult child. Furthermore, a lack of male children is often the main reason for displacement and the inability to age in place (Farzana & Malaker, 2019). In terms of socio-economic conditions within Bangladesh, elderly females often face harsher conditions from a lack of education, job opportunities, and lack of adult children or a spouse to provide companionship and support.

Older Bangladeshi populations that stay with their families face navigation and physical mobility challenges. Literature review deems specific housing standards adequate in terms of elderly mobility, such as windows for aeration and sunlight, slip-proof flooring, accessible restrooms and safety bars where needed, efficient location of bathrooms, among other quality of life modifications (Vladeck & Segel 2010). Similarly, in outdoor environments, lack of paved sidewalks and footpaths or handrails on slopes and stairs quickly become elderly hostile. In rural areas, wandering livestock, substandard waste disposal, and lack of vehicular speed regulations make pedestrian activities increasingly unpleasant and dangerous (Farzana & Malaker, 2019).

### 9.3.4. Healthcare Challenges

The quality of healthcare services has also gone under scrutiny within Bangladesh. Over half (55%) of elderly respondents in Khan's study received treatment and care from village doctors or pharmacists – and very few (9%) indicated a willingness to be treated at a government hospital or clinic. Those that did go to hospitals, out of dependency on the government health facilities,

complained about a lack of quality in service delivery and low expectations for the level of treatments. Negative sentiments towards government health services are primarily attributed to lousy administration, lack of accountability, and corruption within the facilities – often leading to its high ineffectiveness (Khan & Leeson, 2006).

#### 9.3.5. What does this mean moving forward?

Bangladesh has laid down the foundations for honoring and providing support for its elderly population. By creating provisions for elderly care and defining quality of life standards, the country has ensured the creation of future policies geared towards aging in place. Promoting aging-in-place infrastructure will ensure continued growth within the aging community by providing adequate support through the housing environment (Farzana & Malaker, 2019). As such, while the Bangladesh government continues to develop the institutional framework and implementation of the universal pension system, there are available steps to increase retirement preparedness. One of the most extensive vulnerabilities to aging in place is the lack of permanent residence; by increasing the ease of obtaining mortgages and providing affordable housing, the government will be able to prepare and encourage its workers to move towards homeownership. Thus, addressing both a passive source of income for elderlies and access to stable and secure housing in cases of widowed or childless elderly populations.

To ensure future financial stability and independence in cases where adult children are unavailable, or elderly Bangladeshis find themselves widowed – the government should consider continuing education support systems to boost literacy rates alongside comprehensive welfare systems. Similarly, it would be beneficial to involve the elderly in faith-based institutions and voluntary programs in the future, as these organizations play a vital role in complementing and supplementing government services (Islam & Nath, 2012).

Eventually, as the universal pension system solidifies, policymakers will face difficult choices in healthcare resource allocation, considering how to feasibly and simultaneously allocate resources to treat chronic diseases in older ages and provide preventative measures and cures for childhood diseases such as polio and measles (Khan & Leeson, 2006). Similarly, existing hospitals could expand to introduce geriatric wards, allowing elderlies to receive treatments and care specialized to their needs and conditions. Comprehensive gerontological research would aid in better understanding the aging solution in Bangladesh and provide culture-sensitive solutions to address their aging issues.

### 9.4. Nigeria

Facing a prominent youth bulge, Nigeria's current state of healthcare must focus on training its young population while monitoring its current sizeable aging population. The concept of aging in place has been widely accepted across the country – if “long term care options... [catered] to their basic needs and not interfere with their freedom, dignity, and access to their family” (Cadmus, 2020). However, regardless of location, many barriers to aging in place lie in the lack of



dedicated services and support for elderly and aging populations. Currently, three main issues plague the elderly population in Nigeria: (1) marginalization of elderly residents in rural areas; (2) lack of planning for retirement and management of pension schemes; and (3) issues of social isolation (Tanyi, Andre, & Mabh, 2018).

Studies from a citizen's perspective on senior healthcare in Nigeria have indicated the lack of political motivation and government support for “the need for action on aging” (Alao, 2013). These sentiments can be partially blamed upon the neoliberal landscape of Nigeria, which resulted in reducing state influence within the economy, thus focusing more on privatization and market-oriented reforms. With neoliberalism celebrating the individual in their capability for producing – there has been a cultural shift in viewing the elderly status as full of wisdom and knowledge to aging and a burden. Additionally, state subsidies were removed for the elderly, leaving them in a precarious and vulnerable financial state.

As such, primary care for the elderly has primarily fallen to the responsibility of immediate families; however, "increased participation of women in the workforce" (Cadmus, 2020) has created a cultural shift and led to a reduction in care. As recognition of the difficulties of maintaining the current care situation spreads further, many families that served this role "were open to the concept of institution-based long-term care" (Cadmus, 2020). Furthermore, long-term care requires resources to maintain – and without an efficient pension system and lack of familial support – many elderly Nigerians face a bleak future.

Older generations face similar problems regardless of their environmental settings, ranging from "health issues, [to] inadequate support structures, and [lack of] targeted services to cater to their needs" (Cadmus, Adebuseye, & Owojae, 2021). However, elderly persons living in urban locations often have a higher quality of life in terms of aging – as urban residents often have access to higher levels of education and better job opportunities and, therefore, higher incomes (Cadmus, Adebuseye, & Owojae, 2021). Their financial viability grants them access to medical facilities and resources that rural dwellers may not. Alongside the absence of physical and financial infrastructure for senior healthcare, elderly populations face social stigma and stereotypes that negatively impact their role within society.

Circling back to the culture of aging in Nigeria, elders who were once traditionally viewed as a "repository of knowledge and understanding" have now been socially cast off with the shift in generational and political culture (Cadmus, Adebuseye, & Owojae, 2021). There is an absence of social policies that "seek to address the social protection, social security, and well-being of... older adults" (Selin, 2022). While there have been several bills passed that directly address elderlies within Nigeria, such as the Social Assistance Bill and the Senior Citizen Act, the government "lack[s the] political will to transform them into creating beneficial support for Nigerian elderlies" (Selin, 2022).



### 9.4.1. Financial difficulties

Culturally the government respects the elderly and believes in catering to their aging population first – although this may be the case, financial responsibility often falls upon immediate families. Without any pension system or primary source of income, this forces elderly populations without family members to seek welfare from faith-based or non-profit organizations. The lack of an adequate pension system can be traced back to the Structural Adjustment Programme (SAP) in 1986, where Nigeria "reformed its foreign exchange system, trade policies, and business and agricultural regulations" (World Bank Group, 1994). Three main issues have since characterized the SAP: (1) Small farmers being the primary beneficiaries of the program, (2) lack of financial discipline resulting in a defect of provisions in social services and infrastructure, and (3) overall loss of trust within the government.

Due to the downturn in oil markets and the collapse of foreign exchange rates in the 1980s, the urban middle class – primarily civil servants and import-based workers – bore most of the burden. As a result, small farmers became the primary beneficiaries of the SAP (World Bank Group, 1994). Moreover, large amounts of off-budget spending and mismanagement of funding towards projects that never came to fruition became significant contributors to financial erosion and a paucity of monetary discipline. As a result, expenditure on social services in 1986 fell from 14% to an average of 12%; other expenditures on administration and pensions fell from 44% to 26% (World Bank Group, 1994).

According to Apere (2015), the problems that surround pensioners in Nigeria include:

1. Delayed and/or nonpayment of pensions caused by misappropriation of existing funds,
2. low standard of living and high poverty rates among pensioners as a result of no pension increase as inflation rates rise,
3. frequent and inefficient verification processes that often lead to pensioners dying during verification exercises, and
4. inadequate enforcement of pension regulation by the government.

### 9.4.2. Social Isolation and Exclusion

Similar to Bangladesh, the traditional structure of elderly care families has been collapsing (Okoye & Asa, 2011) because of both rural-urban migration and changing family views from shifts in political ideology. In 1989, the Nigerian government implemented a national social development policy that developed a framework to protect elderly individuals' moral and material neglect – akin to Bangladesh's elderly protection provision within its constitution. Despite it, Nigeria has made no active effort toward developing other laws safeguarding the well-being of its elderly population (Tanyi, 2018). The elderly have become victims of negative stereotypes – "perceived as slow, confused, helpless, resistant to change, and/or generally unhappy" (Abrams & Swift, 2012). Though this generalization may not apply to every elderly adult in Nigeria, age-related bias exists across many settings within the country. As a result, childless elderly adults are commonly

labeled as "witches" and "wizards" within rural communities and are often subjected to physical, emotional, and financial abuse (Tanyi, 2018). In an interview with a local government chairperson, it was revealed that the current sentiment towards older adults was largely negative. The younger generation viewed older residents as "not useful," a sentiment blamed on a lack of elderly-oriented policies and provisions (Tanyi, 2018).

Further studies have demonstrated that rural dwellers often face higher poverty rates due to difficulties in accessing community centers, grocery stores, healthcare, and town calls (Fochingong, 2014; Hartman & Weierbach, 2013; Snedeka, 2017). For elderly adults living in rural environments, this difficulty in accessing much-needed resources negatively impacts their ability to function independently and meaningfully. However, whether isolation is a result of environmental or personal nature – the effects of isolation resulting from accessibility issues are of significant concern for any aging population.

#### 9.4.3. What does this mean moving forward?

For Nigeria to move towards an infrastructure supportive of aging in place, the government must first develop policies that address the issues of older adults. Unlike other developed nations – the current welfare systems within Nigeria cannot adequately provide support for its aging population. Elderly Nigerians face difficulties in accessibility toward quality and effective healthcare treatments, social challenges of discrimination and lack of emotional support, and unnavigable physical environments. These challenges are further compounded by the lack of formal interventions by the government and the disintegration of the traditional family structure from out-migration into urban areas. To address current financial limitations – the government must take steps toward building sustainable growth in economic sectors and poverty reduction strategies. This would require in-depth measures toward reframing and restraining expenditures, revenue mobilization, and returning to a market-oriented exchange rate system (Tanyi, 2018). Additionally, increased morale and improved attitudes towards aging populations need to be addressed. Transparency within policy creation, informational public hearings, and public movements in empathy and support towards Nigeria's older adults will aid in creating sustainable reforms toward aging in place (Tanyi, 2018).

### 9.5. Conclusion

Japan's population does not have the luxury of time to wait for policy development. Thus, the country has directed its resources on creating physical infrastructure and programming to actively develop stopgaps to improve quality of life and provide for aging in place. While the physical environment and housing situations continue to develop, Japan could look towards Denmark to open a line of communication between their elderly population and local municipalities to create a deeper understanding of specific needs for different environments.

Bangladesh requires further comprehensive research to understand the root causes of aging issues within Bangladesh. Much of the current research has revolved around cultural interactions

between older and younger generations and the changing dynamic of familial support. Although constitutional provisions have been made to address concerns for aging Bangladeshis, there is a need to further older residents' socio-economic and physical well-being and how these concerns affect their social statuses in both rural and urban residences (Khan & Leeson, 2006). Additionally, there is a need for improved government efficiency and administrative structure – pushing out corruption and inappropriate allocation of funds would streamline achieving a healthy aging society. As Bangladesh's universal pension system rolls out, quantitative and qualitative research on how effective the system is should be closely followed to aid researchers and policymakers in understanding areas of achievement and shortcomings.

Nigeria's large young population gives the country ample time to develop foundational policies to facilitate aging in place. However, its rapid socio-economic development and shifts within political ideology have created an unstable economic environment that has not viewed the well-being of elderlies as a priority. Much of the current aging population faces social stigmas from ageism, severe poverty, and a lack of appropriate healthcare resources. The current government must build a political foundation that improves the social status of the elderly population back to their glory days – of respect, wisdom, and a resource of knowledge and life skills. Furthermore, restructuring the current pension system and enforcement of elderly-minded social policies would allow for financial independence and less economic stress for existing and future aging Nigerians. Government interventions must ensure adequate support systems within welfare to cater to the well-being of Nigerian older adults. This situation can be achieved by appropriately allocating resources and social work professionalization, further supplemented by establishing geriatric centers, social policies, elderly-directed welfare programs, and establishing community-based services (Selin, 2022).

While these three countries face the same aging future, their respective populations all sit at different stages in life. Looking towards housing provisions like the ones as set by Denmark may provide an answer towards improving overall elderly quality of life and allow for aging in place. (1) The government plays an active role in creating retirement housing and specialized services for the elderly. (2) Allowing for aging in place by delinking care services from accommodations – thus providing healthcare services to elderlies in their own homes. (3) Denmark's culture-specific policies focused on deinstitutionalization and phasing out of nursing homes, as they saw a positive response towards alternative elderly housing arrangements. (4) Privatizing elderly care to expand care resources, quality of healthcare and streamline the process of aging in place and deinstitutionalization (Soh, 2019).

The impact of aging is often a one-sided fiscal relationship, requiring government-led interventions to increase resources to maintain healthy lifestyles and ensure quality healthcare while supplementing costs on limited budgets in later life. A productivism argument has been the catalyst for cost-effective strategies that ultimately reduce older citizens' usage of healthcare services - creating policies that encourage the elderly to take responsibility for their own "promotion of successful, positive" health (Evans, Nistrup, & Pfister, 2018). The idea of successful

aging reframes the negative mentality of aging – where older adults start to view themselves as a burden on societies and families along with the negative biomedical narrative of aging (Evans, Nistrup, & Pfister, 2018). In turn, shift the emphasis on older age as a stage in the life of freedom, leisure, and continued growth in positive, healthy ways – thus advocating for an optimistic view and beneficial lifestyle choices.

Although many older adults view the aging experience as a favorable time for relaxation, enjoyment, and pursuit of happiness after decades of work – aging is still a lonely process. Feelings of disconnection compound upon one another as families grow older and children gain independence, as friends, acquaintances, and spouses grow apart and eventually pass away. It is imperative to understand the underlying causes of social isolation. Currently, many community settings are not designed to be aging friendly – and are catered to able-bodied residents. Physical environments in terms of ease of mobility, accessibility to public transportation, and place of residence play a significant role in isolation among the elderly. This can provide insight into mitigating feelings of neglect, abuse, and loneliness.

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## 10. Healthcare and climate change

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*Brane Gradina*

### 10.1. Japan

Healthcare adaptation in Japan is a part of the broader Government's framework for tackling climate change. The adaptation process is centralized so that the Government oversees each sector through the Adaptation plan and secures functional coordination between them. The formulation of the goals and actions in the health sector is based on scientific findings and broad scientific participation organized through Central Environment Council. That body serves as an advisory body for the Government.

The adaptation plan for the health sector singles out three principal issues and explains how the Government will address them. The first one is related to the mortality related to heat stress. The response is based on a comprehensive framework created by various agencies to "provide meteorological information, implement actions including appropriate information provision relating to topics such as cautionary alerts, awareness-raising regarding prevention and treatment, and status of outbreaks of heat illness, in various situations including emergency response, education, health care, labor, agriculture, forestry and fisheries industries, and everyday life" (p. 79). The accent is on raising public awareness and alarming the public in a timely manner. On top of that, the agencies will also inform the public of heat-related patient trends. The focus is on prevention rather than mitigation. Particular attention is given to children as they are one of the most vulnerable groups. The plan envisions school controls and various educational programs for schools to raise awareness of people responsible for students. The elderly, the second most-vulnerable group, are not directly included. However, a part of the strategy is related to protecting the workers in the agriculture, forestry, and fisheries industries. The main goals in those fields are "to reduce the exertion level of the work, by upgrading equipment performance and actively introducing robotic technologies and information and communication technologies (ICT)" (p.79). The implementation of heat-related strategies is the responsibility of the Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science, and Technology; Ministry of Health, Labor and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; and Ministry of the Environment.

The second focus in health adaptation is on the infectious diseases.

The Government's team has concluded that there is still much uncertainty about the relationship between infectious diseases and climate change. So, the main goal is to collect scientific findings to understand the best way to implement the prevention and strategy. However, regarding the spread of mosquito-borne infectious diseases, the strategies are primarily based on the Special Guidance on Mosquito-borne Diseases, as Japan has an active policy regardless of the Adaptation

plan. The prefectural governments and other agencies are undertaking actions that include “ongoing fixed- point observation in areas where mosquito vectors of infectious diseases occur, measures targeting sources of larvae, extermination of adult insects, and calling attention to mosquito-prevention measures; also, they are to make efforts to understand trends in the occurrence of infectious diseases” (p. 80). The actions and budget for these actions are the responsibility of the Ministry of Health, Labor and Welfare, and the Ministry of the Environment.

The health adaptation plan leaves the possibility of outbreaks of other climate-related diseases like diarrhea. The main actions include “promoting water quality improvement measures such as air pollution prevention and measures to upgrade combined sewer systems, and make active efforts to collect scientific findings” (p.81). However, the plan states that to increase protection of vulnerable populations, there should be more scientific findings. This is the field in which two ministries cooperate: the Ministry of Land, Infrastructure, Transport and Tourism and the Ministry of the Environment.

## 10.2. Bangladesh

Unlike Japan, Bangladesh's approach to adapting the health sector is based on a broader analysis of the most important factors contributing to climate vulnerability. The Bangladesh Health National Adaptation Plan (HNAP) is the focal point of the country's health adaptation strategy. The plan is built upon the previously approved National Adaptation Plan (NAP). The coordination of the HNAP is the responsibility of the Ministry of Health and Family, Climate Change and Health Promotion Unit (CCHP). The unit acts simultaneously as a technical working group and as an advisory body for the implementation of the HNAP.

The HNAP is divided into ten components, focusing on long-term strategic objectives. These components are discussed in the following subsections.

### 10.2.1. Leadership and governance

The focus here is on establishing "specific responsibility and accountability mechanisms for climate change and health within the Ministry of Health, including the incorporation of climate change and variability considerations into health policies and programmes" (p.27). As the main barriers, the plan singles out the lack of a proper coordination mechanism among various actors and a lack of relevant human resources. The coordination issues can be seen as a major weakness of HNAP, as each component states similar issues. Further examination of the governmental structure may further clear out the principal reasons. The plan proposes four adaptation options in this part. The first one is to strengthen CCHP with a clearer strategy and own budget. The next one is to "Develop a reporting tool to assist ministries in reporting CC&H activities to strengthen interagency coordinating platforms for CC&H focal point and other climate-sensitive programs and health-determining sectors (water, environment, agriculture, energy)" (p. 28). The third is to establish a task force for monitoring of the progress. The last one is the establishment of the district-level climate change teams to coordinate climate change issues with local health systems.



### 10.2.2. Health Workforce

The main objective of this part is to ensure an adequate number of health workers that are able to deal with climate-related illnesses. There is a general trend of lacking essential medical workers that climate change is expected to multiply. The second goal is to ensure that the health sector's knowledge, information, and resources are used efficiently to deal with the climate-related health risks. Finally, the goal is to raise awareness about the relationship between climate change and health among different stakeholders. A main barrier to achieving goals is the shortage of adequately trained technical staff, limited financial resources, unbalanced distribution of resources, and less involvement of the younger workforce. The plan proposes work on raising awareness about climate-related health risks within the Ministry of Health and Family. In addition, health workers should have appropriate in-service training about climate change risks. Finally, it will be necessary to develop climate-focused educational programs as well as effective communication campaigns.

### 10.2.3. Vulnerability, Capacity, Adaptation

This is a critical component that aims to inform policymakers in other fields about climate change risks. The main part is a Vulnerability and Adaptation (V&A) assessment, "which aims to assess population vulnerability to different health effects, identify weaknesses in health and other systems, and recommend interventions to address these issues" (p.29). The main obstacles are financial and human resources, a lack of coordination between key stakeholders, and issues with data. The plan proposes that V&A assessment should be updated, so that it includes a climate-health analysis. Secondly, there should be adequate resource allocation and more efficient coordination among actors.

### 10.2.4. Risk Monitoring and Early Warning

This includes disease surveillance and consecutive analysis of health risk, as well as early warning system. The goals are improving the data collection and analyzing the climate-related environmental risk and epidemiology. Another key element is timely communication of such risk to the public, media, and decision-makers to act preventively. However, the obstacles are the same as in other cases – a lack of coordination and data issues. The plan proposes a prioritization of three climate-sensitive diseases in order to develop an integrated monitoring system with climate/weather data. In addition, implement an early warning system for vector-borne and water-borne diseases.

### 10.2.5. Health and Climate Research

This sector's main goals are to create a multidisciplinary research agenda on a national level for climate change and health with a particular focus on vulnerable population. This body should also serve as a support for developing research capacity among the broader professional and academic community. But the lack of financial and human resources as well as operational

strategies can challenge the objective. The plan proposes the establishment of a national CC&H research agenda. An additional idea is to develop a knowledge-sharing platform to reach key stakeholders and promote science in policy formulation. The previous component refers to the rising awareness of various stakeholders about the link between climate change and health and using the knowledge efficiently to develop the field further.

#### 10.2.6. Medical Products and Technology

This component relates to the essential medical products and technologies that tackle the traditional lack of essential medicine, such as vaccines and surgical equipment. The aim is to approach the issue of climate risk in a systematic manner. The selection of new technologies for healthcare should consider climate-related diseases. Finally, it aims to strengthen the sustainability of health operations. To achieve that, the plan suggests implementing the "green hospital" initiative. Also, it is essential to develop "guidelines and SOPs for health protection from adverse health effects and pre-and-post disaster situations including standardizing emergency health supplies and stockpiling" (p.34).

#### 10.2.7. Managing the Environmental Determinants of Health

The plan recognizes that climate change can impact health indirectly through water, air, food, waste, and housing. This component is very important for identifying the complexity of the climate-health relationship. However, the lack of coordination, no clear standards in identifying health risks and weak technical capacity stay as the main challenges. The adaptation options that the plan underlines are the implementation of projects related to resilience of water management and projects related to reducing air pollution. Also, there is a need for improving air quality monitoring.

#### 10.2.8. Climate-Informed Programs

Health policies should consider and be aware of climate change risks. The aim is to integrate climate information into strategic planning of future health programs as well as check and improve their standard operating procedure. The main obstacle is a lack of awareness of climate-related risks among decision-makers. The plan proposes the inclusion of climate change risk into relevant policies and operational plans. Also, it proposes the development of risk maps.

#### 10.2.9. Emergency Preparedness and Management

The main goal is to emphasize the importance of preparedness and emergency response. Climate conditions should become one of the foundations of future emergency and risk management protocols. In addition, health system capacity should be strengthened to manage projected risks. On top of that, the focus must also be on empowering communities to effectively prevent and respond to the health risks. The plan's adaptation option is to integrate climate-sensitive health

risks and data about climate change into the national disaster risk reduction strategy. It also underlines the importance of implementing climate risks into emergency plans.

#### 10.2.10. Climate and Health Financing

The final component is climate and health financing, which analyses this sector's financial needs and mechanisms. To create a sustainable and resilient health system, Bangladesh must develop "a resource mobilization plan that identifies funding mechanisms for health" (p. 38). In addition, it will need to use cost-benefit analysis to adapt to the health sector. Finally, Bangladesh needs to reach out to international climate change and health funding sources. The last one is also a limitation as the strategy depends on donations.

### 10.3. Nigeria

Nigeria's climate-related health strategies have a less precise and centralized framework than Bangladesh and Japan. The focal point is 2020, the national adaptation plan (NAP). However, unlike the two other countries, there are no separate guidelines for health sector adaptation. The coordination of the NAP is the responsibility of the Department of Climate Change, which is part of the Federal Ministry of Environment. The 2021 National Climate Change Plan of Nigeria states that "the main direction of government policy in the health sector is to make it climate-resilient and be able to pursue the attainment of SDG 3, which is to ensure healthy lives and promote wellbeing for all at all ages" (p.33). However, the detailed steps and strategies are vague or missing from the most important documents related to climate change adaptation. Thus, we will be presenting only the 2021 NCCP as it represents the most detailed adaptation view on the health sector. The policy measures are:

1. Strengthen the extant adaptation strategy for the health sector including aligning it with the National Adaptation Plan (NAP) Framework.
2. Strengthen surveillance programs for monitoring human health under a changing climate
3. Promote climate-resilient infrastructural development and maintenance in the health sector.
4. Promote policies that will retain qualified health personnel that will enhance health sector resilience
5. Create a functional, effective and transparent programs for their retention.
6. Promote community hygiene and general cleanliness in all sectors.
7. Promote preparedness in all areas of primary healthcare delivery and response to climate-induced diseases and pandemics.

However, the 2011 NASPA-CCN, an official and active strategy, recognizes vulnerable groups as a separate category needing additional adaptation attention. The plan proposes the development of special support and assistance programs for women, children, the elderly, and people with disabilities. The strategies are based on several goals:

1. Create awareness among government staff, including disaster and emergency management personnel, about climate change impacts and how these impacts affect vulnerable groups.
2. Provide basic training for government staff on gender awareness tools to enhance implementation capacities.
3. Adapt government programs, including emergency response plans and programs directed at vulnerable groups, to better address the impacts of climate change on these groups.
4. Adapt public service facilities, including school buildings, to withstand storms and excess heat.
5. Intensify immunization of children and youth to provide protection against diseases that are expected to become more prevalent with climate change.
6. Retrain health workers to appreciate emerging climate change challenges within the context of immunization delivery and other comprehensive healthcare delivery.
7. Encourage faith-based and civil society organizations to provide social welfare programs and other support to address the climate change-induced needs of vulnerable groups.

#### 10.4. Climate change health impact - Heat

Heat is one of the most direct consequences of climate change on public health. It is caused by a stable increase in surface temperature that reflects in more frequent, severe, and longer heatwaves. The World Meteorological Organization defines heat waves as “a period when the daily maximum temperatures of more than five days exceed the average maximum temperature by 5 °C, with the normal period being 1981–2010” (WMO, 2022). Although many countries are taking adaptation measures, exposure to high ambient temperature is still considered one of the most important environmental health hazards. Approximately 9.4% of the deaths globally are associated with heat (74 deaths per 100,000 people a year) (Zhao Q, 2021). In addition, we also need to consider that despite a decrease in the total population, an aging world population is one of the factors that contribute to that outcome. However, heat impact can also be observed other than a health issue. According to the latest sixth IPCC (2022) report, the increase of mortality from the heat between 2000 and 2018 led to increase of monetized costs of those deaths. In terms of the proportion of gross world product, the cost increased from 0.23% in 2000 to 0.37% in 2018. In addition, there are some significant regional variations. Thus, Europe is the worst affected region, with a total cost equal to the income of 11 million of its citizens in 2018 and 1.2% of regional gross national income. On the other hand, the Southeast Asia region and Western Pacific have significantly lower losses when compared to their gross national incomes, 0.19% and 0.43%, respectively. However, the impact is significantly different (higher) than their average incomes. In this chapter, we will be examining more in detail the economic and social impacts of heat in the context of climate change.

## 10.5. Aging population and climate change

Aging is one of the indicators that many scientific studies, including IPCC reports, underline as essential in climate change impact projections. There is a common understanding that children and the elderly are the most vulnerable groups in one population. The health risk posed by high atmospheric temperature is a complex issue since, in many cases, heat is only an aggravator of the individual's current condition. The elderly population is more vulnerable because it is more likely that people in older age groups will already have some chronic health issues. One of the studies conducted in the United States showed that excessive heat negatively impacts several conditions. First, persons with "neurological disorders and dementia are more vulnerable to extreme heat due to physiological, behavioral, and social factors" (Zanobetti, O'Neill, Gronlund, & Schwartz, 2013) p. 816). In addition, medication for those conditions is more likely to impact a person's ability to thermoregulate, which only aggravates the heat vulnerability. Similarly, people with diabetes are found to be more susceptible to heat than other groups due to impaired thermoregulation through impaired autonomic control and endothelial function. Other chronic conditions prevalent among the older population, such as blood cholesterol or increased blood viscosity, can also lead to increased morbidity caused by heat.

But the prevalence of comorbidities is not the only factor that lowers their temperature response. Although there is no strong link between aging and loneliness, various studies showed that elderly people are more likely to experience some form of social isolation. The reasons vary from traditional family structure and local social norms to migration. A study from South Korea showed that "higher social gathering and mutual aid levels were associated with lower heatwave-related mortality" (Kim, Lee, Kim, & Cho, 2020) (p. 141). In addition, the same study also found a correlation between housing type and heat-related mortality risk. They found that "one-person elderly tenement households are at a greater risk of heatwave-related mortality in the elderly male population" (p. 142). Similarly, the study of the 2003 heatwave in France found that one in four heatwave victims lived alone without friends and family (Poumadère, Mays, Le Mer, & Blong, 2005). The cases analyzed in the urban region of Paris showed that of 383 victims, 337 lived alone.

### 10.5.1. Poverty

Income inequality is one of the topics that got a lot of attention in studies about heat impact. Generally, the analysis showed that the most heat-affected regions would be, at the same time, the poorest ones (Xu, Kohler, Lenton, Svenning, & Scheffer, 2020). In addition, the heat-poverty link goes beyond the global division of poor and rich regions, and the studies showed that such a link exists even at subnational levels regardless of the main region. (Dell, Jones, & Olken, 2009). Although it is rarely only one factor, rather a combination of multiple conditions, socioeconomic status was recognized as one of the important indicators in examining heat-related vulnerability. Multiple studies showed that lower socioeconomic status leads to an increased probability of heat-related mortality. (Poumadère, Naughton, M.P.). For example, studying the 1996 heatwave in Chicago, Klinnberg found that the impact was unevenly distributed in the city. He concluded

that “geography was linked to destiny...the processes that killed so many city residents were concentrated around the low- income, elderly, African-American, and more violent regions of the metropolis, the neighborhoods of exclusion in which the most vulnerable Chicagoans make their home” (Klinenberg, 1999, p.250). With increased urbanization, particularly in the global South, urban condition and income inequality is expected to become even greater. Considering the scientific findings of global warming, we can expect that urbanization will impact heat mortality, especially in the big urban centers. In a study of informal urban settlements in Tanzania, the researchers found that even without extreme temperature, the health risk for slum dwellers will be significant (Pasquini, van Aardenne, Godsmark, Lee, & Jack, 2020). The reason is that those residents have high exposure, high sensitivity, and low adaptive capacity to heat. In addition, the important factor in high-risk levels is the lack of mitigation policies. A study conducted in Nigeria found out that the bottom 20% of the population by the income is 80% more likely to be affected by a heatwave than others (Hallegatte & Rozenberg, 2017). Although the reasons behind such outcomes are multiple, one prevalent is a higher likelihood of being an outdoor worker and having an income that directly depends on weather conditions (mostly from agriculture). Similarly, another study found that “workers in poorer households tend to be engaged in occupations that are more likely to be exposed to temperature stress” (Park, Hallegatte, Bangalore, & Sandhoefner, 2015) p. 30). In this way, their health and income are directly exposed to the impact of global warming. If we include other extreme situations related to the climate change, we can conclude that prospects of moving upward in the income scale for the poor population will be seriously challenged. According to the latest IPCC report, this will particularly affect the Global South population. Case studies in several countries, including Bangladesh and India, suggest that “people are losing two to three times more than non-poor people when hit by a flood or storm” (Hallegatte & Rozenberg, 2017). In the absence of an adequate and systemic adaptation response, which will keep people in permanent poverty as it will be more difficult for them to accumulate assets. The affected population, particularly the rural agricultural population, as an adaptation measure, can decide to migrate. But as research showed, migration out of low-income countries due to lower agricultural production will be significantly less than from middle-income (migration-poverty). That is because poor people from low-income countries will not be able to afford to migrate. As a result, they will be trapped in even deeper poverty.

#### 10.5.2. Productivity

Heat and labor productivity have been extensively examined in the economy, public health, sociology, and other fields. Some estimations are that global warming of 1 degree Celsius can lead drop in labor productivity by 1-3% (Heal & Park, 2014). The assessment is mainly referred to the activities in open-air such as agriculture. On an individual level, as we examined beforehand, it can negatively impact household income and prevent asset accumulation from the government perspective reflected in the yearly GDP. In a study conducted in the United States, the scientists found that “productivity of individual days declines roughly 1.7% for each 1°C (1.8°F) increase in

daily average temperature above 15°C (59°F) ... a weekday above 30°C (86°F) costs an average country \$20 per person (Deryugina & Hsiang, 2014) (p. 1). In addition, in the absence of proper adaptation, the annual growth is estimated to be reduced by 0.06 to 0.16 percent points annually. One of the sectors that is projected to be most affected by global warming is agriculture. Agriculture has an important role in developing countries, particularly as most of the population is still rural. Thus, in emerging countries, agriculture is not only an important component of national GDP but essential activity for rural poor, keeping them out of extreme poverty. Migration is one of the options for poor people to adapt after losses in agriculture regardless of the development level of their country. But as a “consequence of the migration out of rural poverty encouraged by warming, middle-income countries are better off in terms of their GDP per capita... poor countries, to the contrary, are made worse off and may be further trapped in poverty as a consequence of climatic warming” (Cattaneo & Peri, 2016 p.142). However, among the scientific community, there are opposing opinions about the real economic effects of heat-related productivity loss, given many factors that can influence the final outcome, such as adaptation level, economy profile, uncertainties related to climate change, and others. Yet, the danger of damage overpasses the challenges of scientific uncertainty. The recovery period after the exposure to the extreme events is much longer than expected. According to some studies on the effects of climate change disasters on national GDP, the scientists found that the national income declines and doesn't recover for the next twenty years (Hsiang & Jina, 2014). This is particularly noticeable in nations that experience frequent disasters due to a lack of adaptation, so the decline in GDP just accumulates. In addition, the GDP declining trend equally affects all countries, regardless of their level of wealth. Therefore, policymakers need to act in advance to reduce the possibility of such damage.

### 10.5.3. Gender

Climate change and vulnerability both threaten the achievement of the SDGs. One of the goals that is singled out as particularly impacted in the sixth IPCC report is gender equality. A key message from the report in this field is gender with other social inequities are part of the vulnerability to climate change impacts. In addition, to achieve gender equity and climate justice, there should be addressed inequities in access to resources, assets, and services and participation in decision-making. Since social rules are, in significant part, the dominant obstacle in achieving structural gender equality, they need to be addressed by long-term policies and programs in the process of climate change adaptation. However, the adaptation process should not be automatically considered beneficial in terms of gender equality; instead, it is a process that can have both sides. Finally, there are very few cases of successful integration of gender inequities in climate policies so far.

Policy changes in this field are of utmost importance for successful climate change adaptation. Different studies pointed out that gender matters when it comes to the mortality caused by heat exposure. In an analysis of more than 700 peer-reviewed articles published on this topic, the researchers found that high-temperature mortality risk is more associated with heat exposure



for women than for men (Son, Liu, & Bell, 2019). There are multiple reasons, like different physiology, level of exposure, occupational patterns, and others. Although the main finding doesn't change as the region changes, its local characteristics vary significantly. Thus, in a study in Italy, researchers found that the most vulnerable group is elderly women. Factors that can influence the outcome are longer life expectancy than men, higher social isolation compared to men, and lower educational level (Ellena, et al., 2020). In developed countries, socioeconomic status is usually not a significant contributor to women's mortality, mostly because of developed healthcare and social systems. To illustrate, an Australian study found that the socioeconomic status of women has no role in their higher mortality rate. (Yu, Vaneckova, Mengersen, Pan, & Tong, 2010). On the other hand, in developing countries, like India, the challenges that affect higher heat-related mortality among women are different. Poverty is the leading cause together with "poor access to healthcare and cooling facilities due to personal safety concerns and a lack of access to personal transportation, culturally prescribed heavy clothing garments that limit evaporative cooling, and a lack of awareness of women's vulnerabilities to heat among local, national, and global decision makers and health care personnel" (Sorensen, et al., 2018) (p.284). These studies show how important it is that policymakers know the local conditions and factors that impact gender-related issues.

## 10.6. Policy recommendations

*Enhance community development practices, especially for marginalized and vulnerable groups.*

Governments should promote civil society organizations and community groups. Actions to be taken in this field can be divided into two focus groups. The first one is administrative support. In many parts of the world, local communities are discouraged by the central governments from forming or participating in any form of civil organization. The lack of cohesive communities leads subsequently to greater vulnerability when it comes to the impacts of extreme events, including heat. For example, during the 1996 heat in Chicago, lower-income, minority communities were the most impacted in terms of mortality. The difference in mortality is noticeable between Latino and Black neighborhoods, and one of the assumptions lies in a more cohesive Latino community. The second focus group is finance. Even when there are naturally developed community organizations, without funds, they can hardly develop impactful programs. The financialization of the community organization, particularly those among the marginalized population, was scarce and, in some cases, depended on international aid and voluntary organizations. For the real impact, such organizations need to be systemically recognized by the governments as valuable assets for the local population. In many parts of the world, government programs can hardly reach the most vulnerable due to lack of information, cultural barriers, or similar obstacles. Therefore, local community organizations are an essential factor for equitable outcomes out of government policies, particularly policies for climate change adaptation.



*Health adaptation plans for climate change should promote the participation of the public, particularly those most vulnerable and marginalized.*

In the three countries we analyzed in the climate change section, none of them included public participation in the process of planning adaptation. We believe that the successful adaptation to climate change and particularly health, cannot be based solely on bureaucratic methods. Democratization of the process will secure a more sustainable outcome. Firstly, because climate change is a very local phenomenon. Without taking into consideration all the specificities of vulnerable groups, like environmental justice, cultural differences, or customs, the outcome of formal planning can still be missing, despite the high cost of adaptation. We agree with those authors who think local knowledge is valuable in planning. Vulnerable communities, particularly in the global South, are, at the same time, those most exposed to the climate change impacts. The lack of proper government protection is partially due to the absence of input from those communities.

*Health in terms of climate change adaptation is a cross-sectional issue.*

Although heat most directly impacts human health, we showed evidence of broader impacts as well. In economic terms, health conditions caused by global warming will reflect on productivity and governments' revenues. The productivity in certain sectors will be drastically impacted. On the other hand, given that the world is aging, the countries will need to consider greater healthcare costs as a direct result of heat (or climate change in general). On top of that, climate change will not impact all levels of society equally, raising the question of present social inequalities and potential social conflicts. Therefore, the problem of climate change health impacts needs to be tackled from the highest political levels in order to ensure the most increased possible coordination among various actors. Climate change health impact cannot be the only issue of health departments. For example, Japan's climate change adaptation plan complies with this method; on the other hand, the Bangladeshi and Nigerian plans are still based on sectoral division and weak coordination. This is going to be a challenge for many countries that lack efficient governmental organization and functional institutions, particularly countries with a high level of poverty and corruption. Such countries face numerous challenges, from lack of funds to lack of knowledge to develop an efficient system. However, international organizations that are included in developing the institutional frameworks in those countries should approach the issue of climate change more systemically and not ad hoc as of today.

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## 11. Conclusion: Toward a Longevity Society

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The world is at a turning point in its population history. Improvements to healthcare, sanitation, and healthy living around the world have led to falling mortality rates. At the same time, greater access to family planning, contraception and rising incomes are resulting in falling birth rates. The degree of decline varies from country to country; advanced nations are seeing marginal increases in longevity, while emerging countries are experiencing rapidly falling birth and death rates. Some countries such as Japan and Russia have seen birth rates drop so low that they are below replacement level (2.1 children per woman) and are falling in population. Immigration of young people will only temporarily reduce the problem and is often an unpopular policy in homogenous societies. Globally, there is a rising share of older people, and those people are now living longer. Demographic change has consequences for individuals and governments with respect to productivity, consumption, healthcare, pensions, education, and environmental impact.

We analyzed the challenges and opportunities for countries in different stage of aging through economic, social, and environmental dimensions in Japan, Nigeria, and Bangladesh in this report. As global aging intensifies because of declining global fertility, it is urgent that countries confront this issue. The analysis of challenges and policy proposals for these three countries, at different stages of aging and with different economic capacities, need to be discussed separately. Despite these different country contexts, it is helpful to flip the narrative from an **aging society** to a **longevity society**. A longevity society focuses on social, economic, and environmental equity to ensure that elderly people continue to live fulfilling lives. Measures can be short-term or long-term and often involve actions at a younger age.

The price of Japan being one of the first developed countries is that it is now one of the world's oldest societies which has brought about problems such as low fertility, labor shortage, and difficulties in economic transformation. In turn, these problems have created bottlenecks in the development of the country's GDP. The country has partially addressed the issue of economic production with unmanned technology, increasing female labor force participation, and delaying retirement. However, Japan, which has been an aging society since before the 20th century, has inevitably experienced a prolonged economic slowdown. Japan has implemented many social welfare programs to protect the rights and interests of the elderly, such as the pension system and the health insurance program for the elderly, which are very comprehensive and widespread, and to a certain extent protect the needs of the elderly and their social status. However, the extensive support and funding has put a great deal of pressure on the financial sustainability of the Japanese state. In addition, Japan, as an island country, is facing increasingly serious climate change problems. The elderly will be particularly vulnerable to climate change because it will increase the incidence of disease, which will bring high medical expenditure burden for Japan. To ensure the health of the Japanese economic system and save it from decline, some improvement in its economic efficiency ratio and shift from curative to preventative healthcare

will reduce the ongoing drain of the current aging society. The Japanese government should introduce a reform system to reduce the cost of living for all people, stimulate the fertility rate, and reduce the social pressure on the younger generation in terms of the country's unique cultural background and social status. This will help Japanese society to mitigate some of the negative effects of an aging society and save the financial sustainability strategy in the long term. If Japan can successfully implement these proposals, other advanced and aging economies can follow suit.

Longevity in Japan therefore requires targeted investment in preventative health (including mental/neurological health), lifelong learning to ensure that skills among older people are consistently in demand, and increasing the flexibility of the labor market, e.g., to enable more part-time, benefitted work. Increasing gender equity is vital: the gender pay gap is among the highest in the developed world. Pay parity ensures the women, who live longer, will have adequate retirement savings. Increasing the retirement age should be done in line with increasing healthy life and after comprehensive public discussion. Municipal reform in line with Toyama City will improve local administration of public services and infrastructure for the elderly. Behavioral measures to increase individual pension saving, such as automatic enrolment, deposit reminders, or financial education, can increase aggregate savings relatively cheaply.

Bangladesh's overall economic performance is in the middle of these three countries, and an aging society will arrive in about 50 years, though it is currently experiencing a demographic dividend. It is following the path of other countries in Asia as well as in Latin America. The declining birth rate and declining mortality is a sign of the success of the current family planning program. In this context, further improvements in medical care and the educational expertise of practitioners are needed to ensure the survival of newborns. The level of education in Bangladesh still needs to be improved, and the current situation does not meet industry needs. Although the labor market is constantly in short supply, most of it relies on low-cost production levels that cannot support the country's overall economic needs. The country needs to disentangle the paradox of higher unemployment among higher-educated people. Bangladesh continues to undergo labor transformation and the entry of technology-based industries has strengthened the economic foundation. Another reason for Bangladesh's distress is its unique geographical location and vulnerability to natural hazards. It has inadequate medical technology and a gap in information collection, hindering the response to natural disasters. Although there are regulations in the pension and health insurance system today, the lack of enforcement and of public awareness have led to a lack of awareness and concern at the national level. As a result, social welfare is not being increased. The formalization of management systems and legal regulations is the primary corrective decision. In addition, the imbalance of gender ratio under the general perception of the society restricts the economic development. The first thing to accomplish is to improve the country's economic productivity in order to partially alleviate the pressure of spending in the face of an aging society in the future.

To ensure that Bangladesh is well placed for a longevity society, then, it needs to focus on formalizing its economy. Formalization is a long-term process. Contingent jobs (part-time, contractual, and gig/freelance work) may serve as an interim measure to bring informal work into the formal sector. Increasing employment opportunities now will fund the necessary expenses for an elderly population in the coming decades. Climate and sales (VAT) taxes are also a potential source of financing that can be implemented in the short- to medium-term. The government should waste no time implementing the recently-announced universal pension.

Nigeria exemplifies other young, resource-rich countries. Nigeria's over-dependence on oil has resulted in an adequate but undiversified base labor force. The apparent lack of skill pool and educational capacity makes labor force transition difficult. Employment opportunities are not growing in line with population growth. Nigeria's narrow industrial base and weak manufacturing sector, coupled with structural inefficiencies, require the development of a strong institutional framework and governance pillar to support the economic management of natural resources. It does, however, have a growing digitally savvy entrepreneurial population. Although the country's system is not affected by aging now, its life expectancy is increasingly quickly and is expected to reach 75 by 2060. The financial pressures for individuals from pensions as well as health care gaps are similar, and the same pressures are brought to residents who are unable to receive pensions and pay for health care, especially the elderly population. However, their current ability to manage resources may put them at an even greater disadvantage due to an aging population. In addition to receiving financial sponsorship from international organizations, it is not a long-term solution. The rule of law and governance at all levels of government needs to be strengthened. The professional quality of managers needs to be improved to address the management system gaps and low implementation efficiency.

As with Bangladesh, formalization and contingent work will be essential for preparing the country for a longevity society. Digital skilling will be useful for making the country competitive in the 21<sup>st</sup> century. Its micro-pension system, if successful, will be an important interim measure until formalization happens. The country needs to urgently reverse the decline in female labor force participation. To finance this urgent investment, Nigeria can tap into its growing pension market, liberalize FDI into key sectors, and implement indirect taxes. Universal healthcare, whether public or private, will be a priority for the government to ensure healthy living for all ages, not just the elderly.

Finally, the international development community and advanced countries need to boost its commitment quickly to climate change mitigation. The effects of climate change disproportionately fall on developing countries, and within these, vulnerable groups such as the elderly. Climate change and aging are not directly related to have multiple indirect links. Both are global phenomena that require a reimagining of public policy and individual behavior, and above all international cooperation. Only then can a just world for all, especially the elderly, can be realized.



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