McKinsey Global Institute

Dependency and depopulation?

Confronting the consequences of a new demographic reality

Authors
Anu Madgavkar
Marc Canal Noguer
Chris Bradley
Olivia White
Sven Smit
TJ Radigan

Editor
Stephanie Strom

Data visualization
Juan M. Velasco

January 2025

Cover image: A silhouetted child soars through the air on a swing set. The setting sun casts a warm glow on the scene, creating a quiet and nostalgic atmosphere. © SchulteProductions/Getty Images

McKinsey Global Institute

The McKinsey Global Institute was established in 1990. Our mission is to provide a fact base to aid decision making on the economic and business issues most critical to the world's companies and policy leaders. We benefit from the full range of McKinsey's regional, sectoral, and functional knowledge, skills, and expertise, but editorial direction and decisions are solely the responsibility of MGI directors and partners.

Our research is currently grouped into five major themes:

— Productivity and prosperity: Creating and harnessing the world's assets most productively

— Resources of the world: Building, powering, and feeding the world sustainably

— Human potential: Maximizing and achieving the potential of human talent

— Global connections: Exploring how flows of goods, services, people, capital, and ideas shape economies

— Technologies and markets of the future: Discussing the next big arenas of value and competition

We aim for independent and fact-based research. None of our work is commissioned or funded by any business, government, or other institution; we share our results publicly free of charge; and we are entirely funded by the partners of McKinsey. While we engage multiple distinguished external advisers to contribute to our work, the analyses presented in our publications are MGI's alone, and any errors are our own.

You can find out more about MGI and our research at www.mckinsey.com/mgi.

Contents

At a glance

— **Falling fertility rates are propelling major economies toward population collapse in this century.** Two-thirds of humanity lives in countries with fertility below the replacement rate of 2.1 children per family. By 2100, populations in some major economies will fall by 20 to 50 percent, based on UN projections.

— **Age structures are inverting—from pyramids to obelisks—as the number of older people grows and the number of younger people shrinks.** The first wave of this demographic shift is hitting advanced economies and China, where the share of people of working age will fall to 59 percent in 2050, from 67 percent today. Later waves will engulf younger regions within one or two generations. Sub-Saharan Africa is the only exception.

— **Consumers and workers will be older and increasingly in the developing world.** Seniors will account for one-quarter of global consumption by 2050, double their share in 1997. Developing countries will provide a growing share of global labor supply and of consumption, making their productivity and prosperity vital for global growth.

— **The current calculus of economies cannot support existing income and retirement norms—something must give.** In first wave countries across advanced economies and China, GDP per capita growth could slow by 0.4 percent annually on average from 2023 to 2050, and up to 0.8 percent in some countries, unless productivity growth increases by two to four times or people work one to five hours more per week. Retirement systems might need to channel as much as 50 percent of labor income to fund a 1.5-time increase in the gap between the aggregate consumption and income of seniors. Later wave countries, take note.

— **In confronting the consequences of demographic change, societies enter uncharted waters.** Absent action, younger people will inherit lower economic growth and shoulder the cost of more retirees, while the traditional flow of wealth between generations erodes. Long-standing work practices and the social contract must change. More fundamentally, countries will need to raise fertility rates to avert depopulation—a societal shift without precedent in modern history.

Introduction

Families across the globe are having fewer and fewer children. In much of the world, fertility rates have fallen below the replacement rate required to maintain a stable population, and, despite increasing longevity, some countries have already started to see population decline. Others may follow in the not-so-distant future.[1]

Falling fertility rates shift the demographic balance toward youth scarcity and more older people, who are dependent on a shrinking working-age population. Longer life spans accelerate the shift. This phenomenon has begun to play out across advanced economies and China, where in three-fifths of countries annual deaths already exceed births.[2] Emerging economies have more runway, but they face the need to get richer before the demographic transformation sets in.

Our current economic systems and social contracts have developed over decades of growing populations, in particular working-age populations that drive economic growth and support and sustain people living longer lives. This calculus no longer holds.

A combination of higher productivity, more work per person, effective migration, and higher fertility rates can ensure global prosperity for the future. That said, no one of those levers alone will be enough, and each presents challenges. Bending the trajectory of the demographic shift will require society to rethink existing systems for work and retirement in ways that may compel a change in our social contract—no easy feat.

This report first explores the demographic shifts driven by falling fertility rates, until recently a trend primarily of interest to demographers and actuaries but now a topic of global conversation.[3] Chapters 2 and 3 provide a comprehensive analysis of the potential economic consequences of falling fertility rates combined with longer life spans. The first wave of aging economies has started to feel the impacts on economic growth, labor markets, consumption, and public finances. Later waves of aging will hit emerging economies, which are expected to face a similar fate just one to two generations later. We conclude with implications and recommendations for policy makers, businesses, and society.

While the global population last declined significantly during the bubonic plague of the Middle Ages, which is believed to have killed roughly half of Europeans, the demographic shift we are living through today is in many ways a result of vast improvements in global health, welfare, and prosperity.[4] Humanity has demonstrated incredible resourcefulness throughout its history, and no doubt will find opportunities to thrive amid the challenges that a worldwide change in demographics poses.

1. The age of youth scarcity

As well-being and prosperity increase around the world, two outcomes—fewer children and longer lives—are reshaping global populations. Over the past several decades, families have shrunk in size virtually everywhere. In much of the world today, the total fertility rate, which we refer to as the fertility rate, is below the replacement rate of 2.1, which is the number of children needed to replace their parents.[5] (Demographic terms used in this report are defined in the glossary.) As a result, the global age mix is shifting. While many people call this phenomenon "aging," in fact the declining number of young people—a youth deficit—is driving the bulk of the demographic shift, a phenomenon we explore in this chapter.

While declining fertility rates and changing population patterns are occurring everywhere, a first wave of regions, generally higher-income ones, has already begun to experience the effects of the demographic shift over the past several decades. Later waves of the same challenge will wash over many emerging economies in the next one to two generations.

Falling fertility is reshaping populations—everywhere

Today in more than half of the world's countries, home to two-thirds of humanity, the fertility rate has dropped below the replacement rate of 2.1 children per woman. Globally, the fertility rate averaged 2.3 children per woman in 2023, just over the replacement rate.[6] Over the past quarter century, the fertility rate has declined in 90 percent of the world's countries (see sidebar "What is the fertility rate?").

The story of collapsing demographics starts in Luxembourg, the first country the United Nations recorded as having a fertility rate below replacement in 1950, when it first started collecting data (Exhibit 1). The country's fertility rate rebounded in the 1950s, however, making Serbia and Croatia, both part of Yugoslavia at the time, the first countries where fertility permanently dropped below the replacement threshold, in 1963 and in 1968, respectively. Within a year, fertility rates in Denmark, Finland, and Luxembourg had followed suit. None of these countries has had a fertility rate equal to or above replacement since then.

Twenty years later, most countries in Advanced Asia, Europe, and North America had crossed the replacement fertility threshold, and China joined them in 1991. Subsequently, fertility rates in countries at varying levels of economic development around the world have fallen below replacement—in Thailand in 1989, Mexico in 2015, and India in 2019. Sub-Saharan Africa is the one region of the world today where fertility rates remain high and are likely to stay above the replacement rate beyond the next quarter century.

Sidebar: What is the fertility rate?

The word "fertility" has a different meaning in the vernacular compared with its use among demographers. Colloquially, fertility often refers to whether a person is able to conceive a child. But demographers focus on fertility rates, a measure of the average number of children women have throughout their life.

Measuring the average number of children per woman in any given generation is straightforward once that generation has passed childbearing age. For example, the calculation today is easy for any cohort of women born before about 1970. However, this reflects only old information rather than providing an indication of how many children families are having today or are likely to have over their lives.

To characterize the fertility rate in any given year, demographers measure the total fertility rate, which is a so-called period metric. The United Nations measures total fertility rate as the average number of children that would be born alive to a woman during her lifetime, assuming she were to pass through her childbearing years conforming to the age-specific fertility rates in that year.[1] Age-specific fertility measures the number of children that women in each age bracket have in the reference period and is typically collected for five-year brackets ranging from 15 to 50 years.

The total fertility rate may differ from what cohort fertility rates ultimately end up being for many reasons—age-specific fertility rates change over time, for example. Fertility rates could be underestimated if younger women today end up having the same number of children as younger women 15 years ago, only later. In this case, the measured fertility rate will fall today, even if the eventual number of children born per woman is the same. Conversely, fertility rates may be overestimated for today's childbearing cohort if the number of children they have in later adulthood continues to fall relative to older cohorts. Nonetheless, the total fertility rate provides a set of harmonized estimates that can be compared across societies, traced over time, and used to predict population size.

Population size is expected to remain flat if the fertility rate is at replacement level, defined by the United Nations as approximately 2.1 children per woman. This represents the average number of children a woman would need to give birth to in order to ensure that she is replaced by a daughter who survives to childbearing age. The true replacement rate also varies across countries and may be slightly higher or lower based on differences in child mortality and sex ratios at birth.[2]

In the long run and setting migration aside, the population of a society with a fertility rate above replacement is expected to grow, while the population of one with a fertility rate below replacement is expected to shrink. However, this rule of thumb doesn't necessarily hold in the short term, since population size also depends on the number of women of childbearing age and life expectancy.

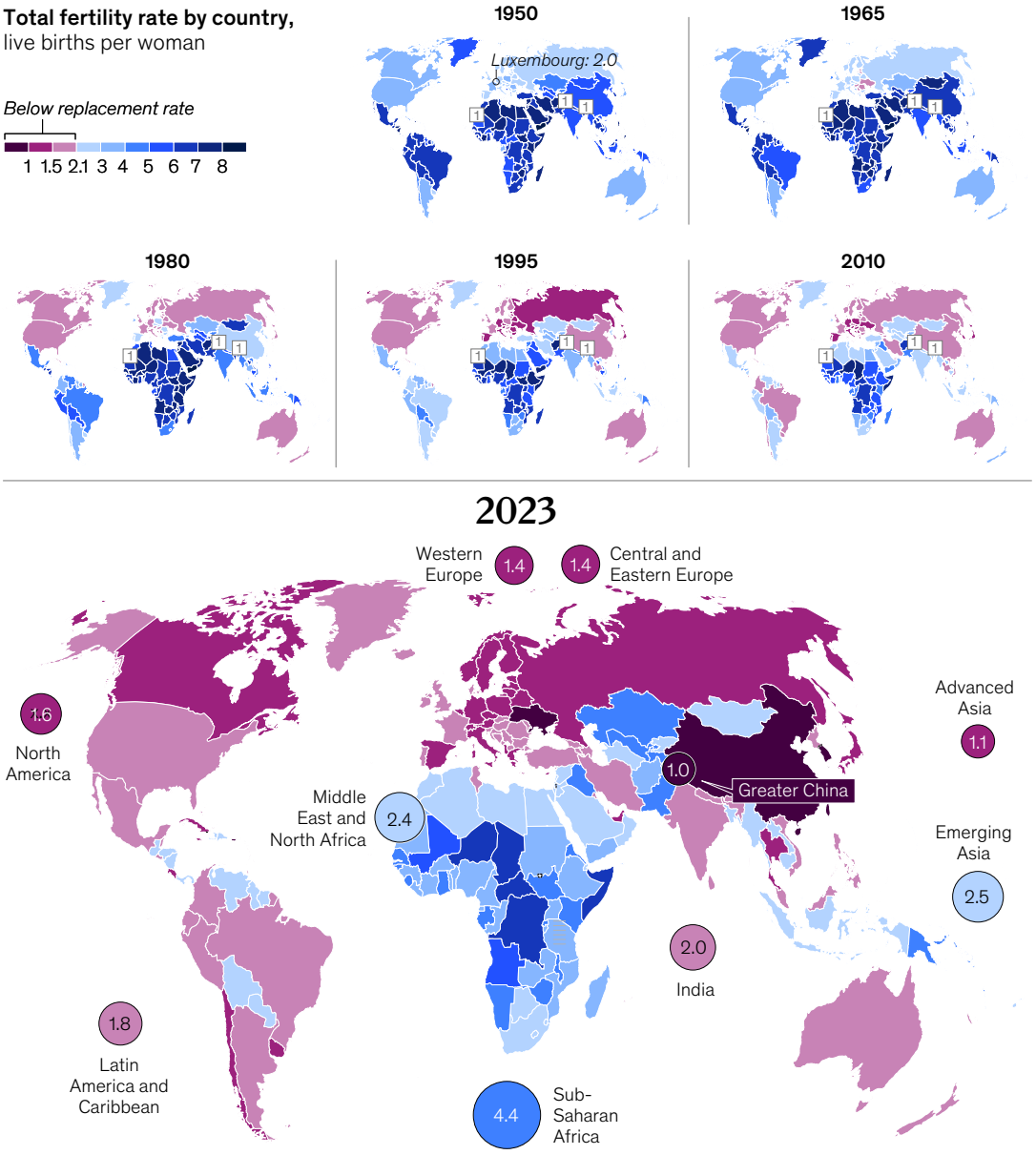
There are myriad causes for fertility changes around the world, ranging from societal shifts to deeply personal decisions. In this report, we do not explore the causes of declining fertility rates but rather examine their potential economic consequences. For a discussion of the causes of declining fertility rates, see, for example, Pablo Alvarez, "What does the global decline of the fertility rate look like?" World Economic Forum, June 2022; Nicholas Eberstadt, "The age of depopulation: Surviving a world gone grey," *Foreign Affairs*, November/December 2024; and Alice Evans, "Why is fertility collapsing, globally?" *The Great Gender Divergence*, November 1, 2024.

[1] *Handbook on the collection of fertility and mortality data*, United Nations Department of Economic and Social Affairs, 2004.

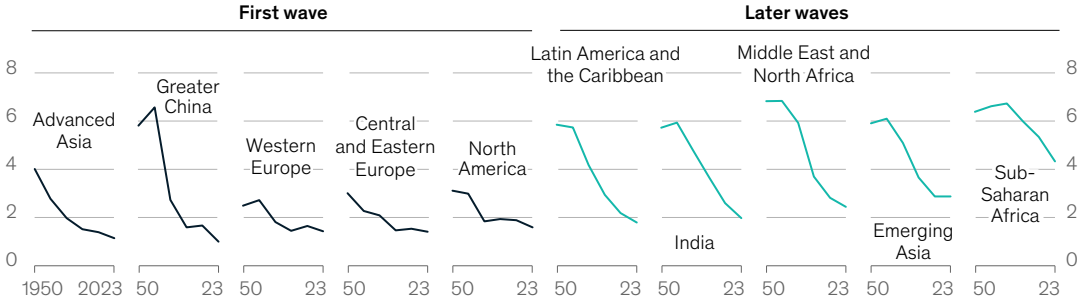
[2] Alternatively, new research measures the effective fertility rate, which accounts for child mortality and brings the replacement rate to 2. The research finds that a portion of declining total fertility rates compensates for higher survival rates—although since the 1990s, this has only been the case in Sub-Saharan Africa, where child mortality rates remained high. See Anup Malani and Ari Jacob, *A new measure of surviving children that sheds light on long-term trends in fertility*, National Bureau of Economic Research working paper number 33175, November 2024.

Exhibit 1

Fertility rates are declining everywhere.



Total fertility rate by region, live births per woman, 1950–2023



Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by McKinsey & Company.
[1]The United Nations reports that the status of borders in this area has not been agreed upon by the parties.
Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

At the same time, life expectancy has increased almost everywhere.[7] But greater longevity explains just 20 percent of the change in the age profiles of populations in developed countries since 1960; falling fertility rates explain the rest (Exhibit 2).

Consider the combined impact of these two forces in Germany. From 1960 to 2021, 26 million fewer babies were born, a number equivalent to 31 percent of the German population at the end of that period, than if fertility rates had remained constant at the 1960 level. Seven million more seniors, or about 8 percent of the country's population, were alive at the end of the period due to increased life expectancy over the same period. Net-net, the country's population in 2021 was 23 percent smaller than it would have been had both fertility and life expectancy rates remained constant, equivalent to roughly 19 million fewer people.

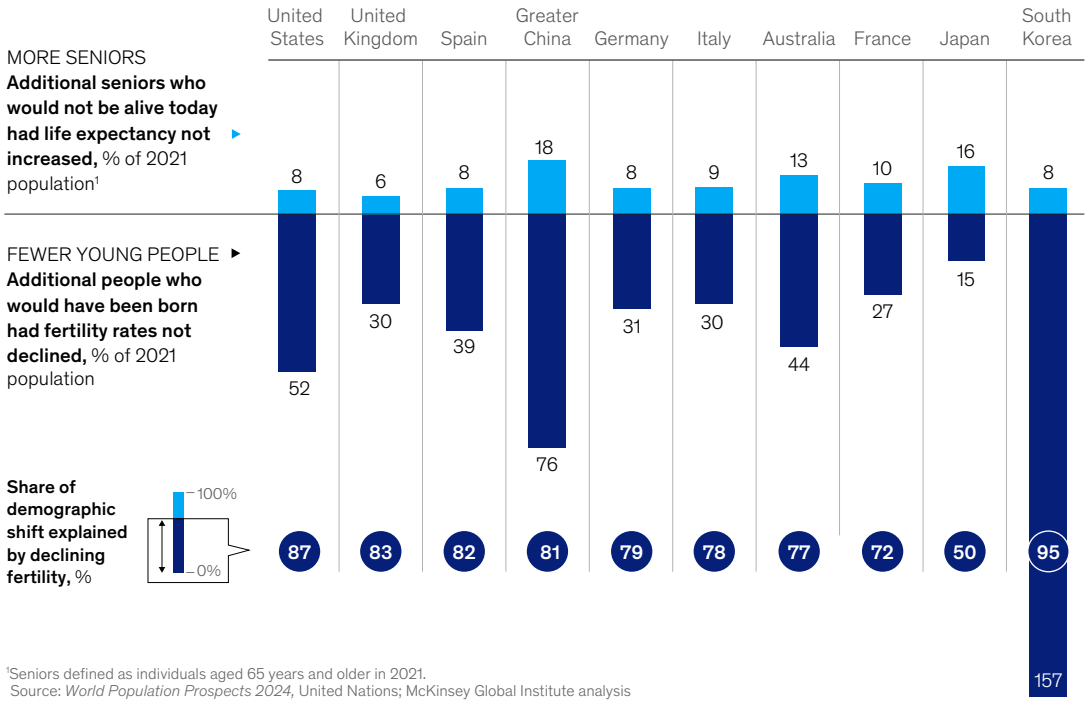
Japan is the only developed country in our research where life expectancy had roughly the same impact as fertility. This unusual pattern was due to two factors. First, Japan already had a very low fertility rate in 1960—1.98 compared with, for example, 2.7 in the United Kingdom at that time. And life expectancy at 65 increased more in Japan than in other countries—by nine years compared with six years in the United Kingdom.

In emerging economies, fertility rates fell even more dramatically from 1960 to 2023. For instance, a woman had an average of 6.1 babies in Brazil in 1960, whereas today, she has 1.6 children.

Exhibit 2

Falling fertility rates explain about 80 percent of the changes in today's total population resulting from the demographic shift sweeping the world.

Impact of changes in fertility rate and life expectancy on total population, 1960–2021, % of 2021 population



[1]Seniors defined as individuals aged 65 years and older in 2021.
Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

Global life expectancy has extended by seven years on average since 1997, reaching 73 years in 2023 and set to hit 77 years by 2050. Centenarians, or those 100 years and older, are the fastest-growing age group in percentage terms, according to the United Nations. Yet for all the attention paid to rising longevity, declining fertility more powerfully determines global demographics.

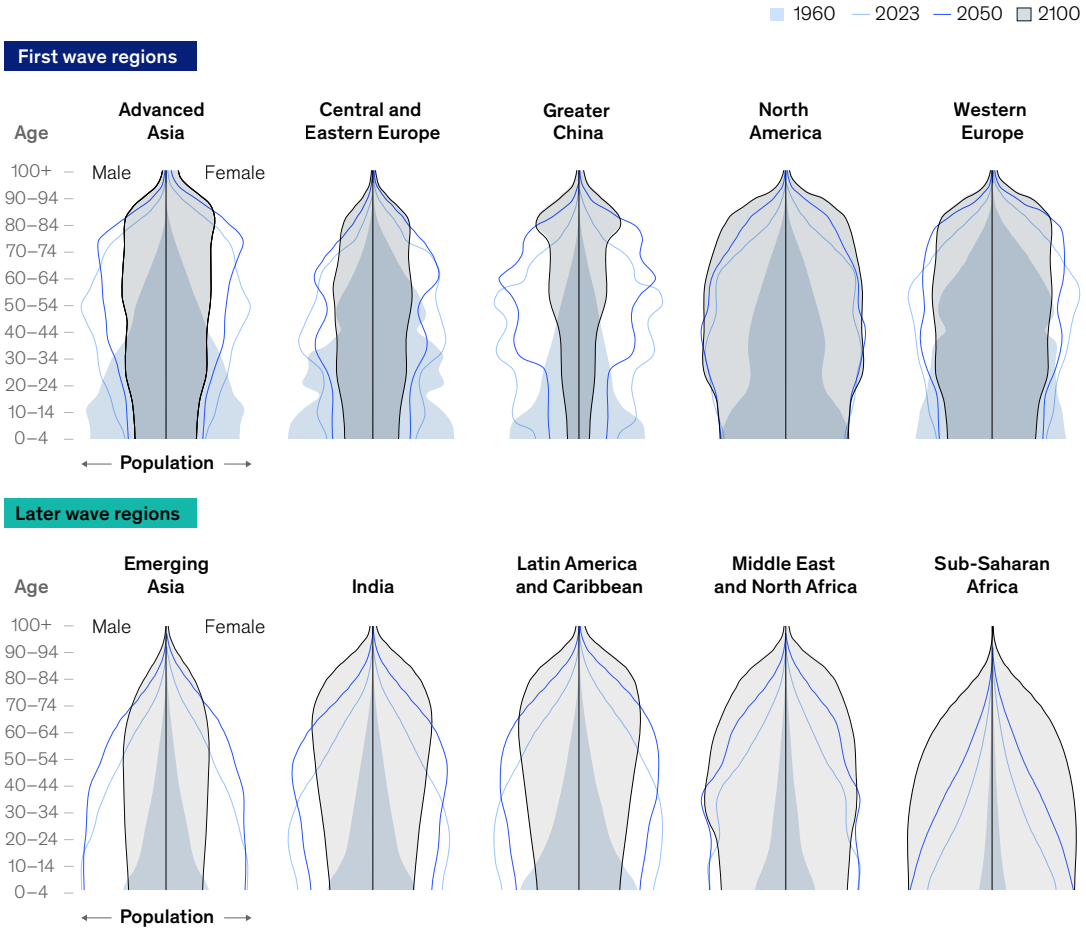
Populations morph from pyramids into obelisks

Due to the demographic shifts we've described, what demographers call population pyramids are shaped less and less like pyramids today. To analyze how population structures are shifting over time, we've grouped the world's countries into ten regions: Advanced Asia, Central and Eastern Europe, Emerging Asia, Greater China, India, Latin America and the Caribbean, Middle East and North Africa, North America, Sub-Saharan Africa, and Western Europe (for more on our classification and data, see sidebar "Pyramid foundations: Demystifying the approach"). In most regions, these structures now resemble shallots, and in more economically advanced ones, they are taking on the shape of obelisks (Exhibit 3).

Exhibit 3

Population pyramids will turn into obelisks by 2100.

Population breakdown by gender and age group, 1960–2100



Note: Pyramids are drawn to scale within each region but not between regions.
Source: *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

Societies are shaped in large part by their age structures, and their economic priorities shift as their population pyramids invert. The amount of physically intensive work done versus the number of physical therapists needed, or the number of families adding nurseries to their homes rather than adding accessory dwelling units to house aging parents, depends on the mix of younger and older people in a population.

Crucially, pension entitlements kick in between 60 and 67 years of age in many economies, particularly in advanced ones. At that point, seniors become recipients of "support" provided by the working-age population, those aged 15 to 64, who generate most of the income and pay most of the taxes that support older people. Without significant changes, the world's aging population means a growing number of older people who aren't working will require the support of a shrinking number of younger people who are. Even if global fertility rates were to jump overnight to the replacement rate, it would take 20 years, give or take, for those additional babies to become adults and begin contributing to economic growth through work.

Sidebar: Pyramid foundations: Demystifying the approach

In this report, we explore the implications of changing demographics by analyzing projected population shifts based on United Nations forecasts. We examine the outcomes across different waves to understand the impact over various time horizons.

We have consolidated the world into ten regions to present our findings, and each of the 237 countries and areas in the UN *World Population Prospects 2024* is individually accounted for so that global populations sum to the total. Our first wave regions include Advanced Asia (Australia, Japan, New Zealand, Singapore, and South Korea), Western Europe, Greater China, Central and Eastern Europe, and North America. Later waves encompass Latin America and the Caribbean, India, the Middle East and North Africa, Emerging Asia (economies not included in Advanced Asia, India, or Greater China), and Sub-Saharan Africa.

Throughout the report, we rely on 20 countries for examples. For first wave regions, those countries are Australia, China, France, Germany, Italy, Japan, South Korea, Spain, the United Kingdom, and the United States. Together, these countries account for 28 percent of global population and generate 65 percent of the world's nominal GDP. The example countries from later wave regions are Bangladesh, Brazil, Egypt, Ethiopia, India, Indonesia, Mexico, Nigeria, Thailand, and Türkiye. These countries account for 35 percent of global population and 12 percent of nominal GDP.

Most of our data sources are publicly available and standardized. The future population projections in this report are based on the medium scenario from the UN *World Population Prospects 2024*, which covers 237 geographic entities, mostly countries. The report includes population estimates from the 1950s to the present, as well as projections through 2100. Additionally, we have supplemented our analysis with income and consumption data from the National Transfer Accounts Project; labor market data from the International Labour Organization's ILOSTAT and The Conference Board; and additional information from Eurostat, the OECD, and, where applicable, national statistical offices. We also use consumption data from World Data Lab and supplement our economic analyses with Oxford Economics data, which are not publicly available.

Throughout the report, our analysis takes a ceteris paribus approach, holding all variables constant except demographic change, to isolate its effect. Our approach has two key limitations to highlight. First, ceteris paribus outcomes throughout this report are not predictions; rather, they are thought experiments to explore to what degree current economic systems "add up" in future demographic realities and to understand the ways in which they do not. These calculations are not dynamic, but we readily acknowledge that ceteris paribus never holds in practice. For example, we do not consider the impact of aging directly on productivity within countries, on personal savings rates, and so forth.[1] Societies are highly adaptable, and they must and will adapt in ways that our calculations do not attempt to anticipate. In fact, the size of the required adjustment is what we attempt to approximate with our methodology.

Second, our sources of data, while robust, have limitations. In some instances, different sources do not agree, and some gaps in the data require interpolation. In some cases, data sources are themselves estimating quantities with a high degree of uncertainty. Even the UN population scenarios, while the closest assessments available to a global consensus view, have their critics (see sidebar "Predicting the future is hard, and demographers don't agree").

[1] See Nicole Maestas et al., "The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity," *American Economic Journal: Macroeconomics*, April 2023.

Sidebar: Predicting the future is hard, and demographers don't agree

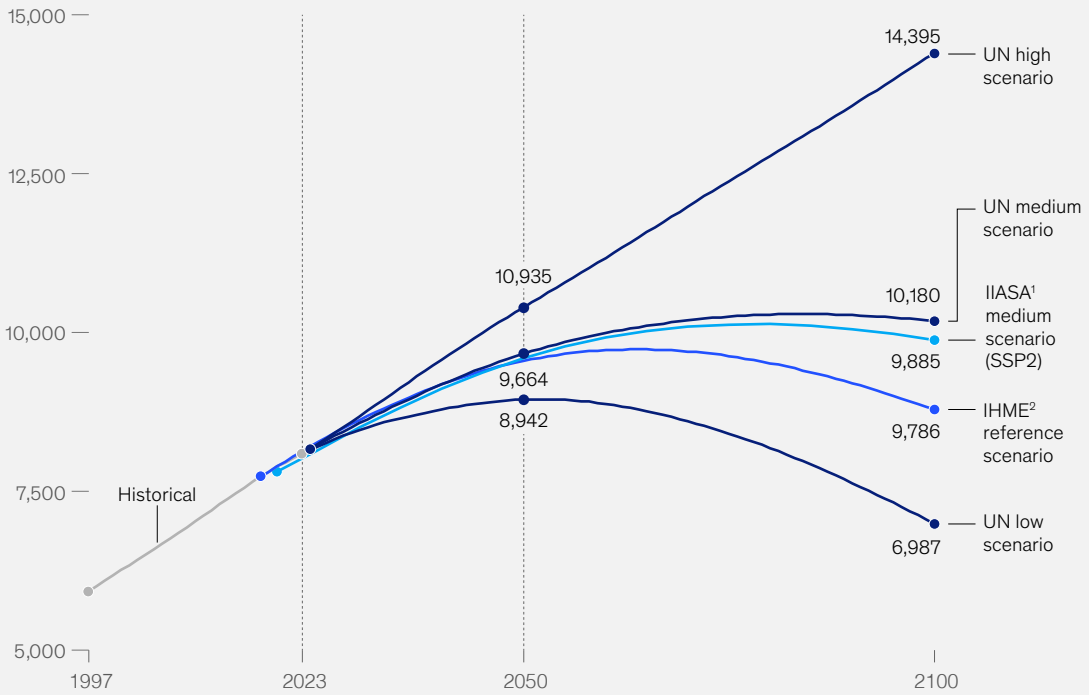
The complex interplay between fertility, life expectancy, migration, and existing population structures throughout the world not surprisingly creates uncertainty about how populations will evolve in the future. Many organizations forecast trajectories, which often vary widely. The projections in this report are based on the UN medium scenario from 2024.[1] The United Nations is keenly aware of the inherent uncertainty in its calculations: its low and high scenarios for global population in 2100 differ by a factor of two, ranging from seven billion humans to 14 billion humans (Exhibit A).

Other well-established research centers such as the Institute for Health Metrics and Evaluation and the International Institute for Applied Systems Analysis use alternative methodologies to estimate population projections, with marginally different results. While the UN medium scenario is the closest thing to a global consensus view, it is not without its critics. For instance, some contend that it is too optimistic in its forecast that fertility rates will stop falling and slightly rebound in many countries (Exhibit B).[2]

Exhibit A

The UN medium scenario reflects the rough global consensus view of population trends, but projections vary across sources and scenarios.

Global population, million, by different UN scenarios and other data sources



[1]International Institute for Applied Systems Analysis. IIASA data are available for 200 countries, by age, sex, and education levels according to 7 scenarios from the Shared Socioeconomic Pathways (SSP) Scenario Database. These include scenarios numbered SSP1 through SSP5, and two additional scenarios which combine SSP2 with zero migration and with double migration.
[2]Institute for Health Metrics and Evaluation. IHME data are available for countries and regions, by age and sex according to 5 scenarios.
Source: *World Population Prospects 2024,* United Nations; IHME; IIASA; McKinsey Global Institute analysis

McKinsey & Company

[1] "Definition of projection scenarios," in *World Population Prospects 2024*, United Nations, July 2024.
[2] See "How does low fertility affect economic growth, worldwide? Jesús Fernández-Villaverde," *Rocking our priors* podcast, Alice Evans, October 2, 2024.

Sidebar: Predicting the future is hard, and demographers don't agree (continued)

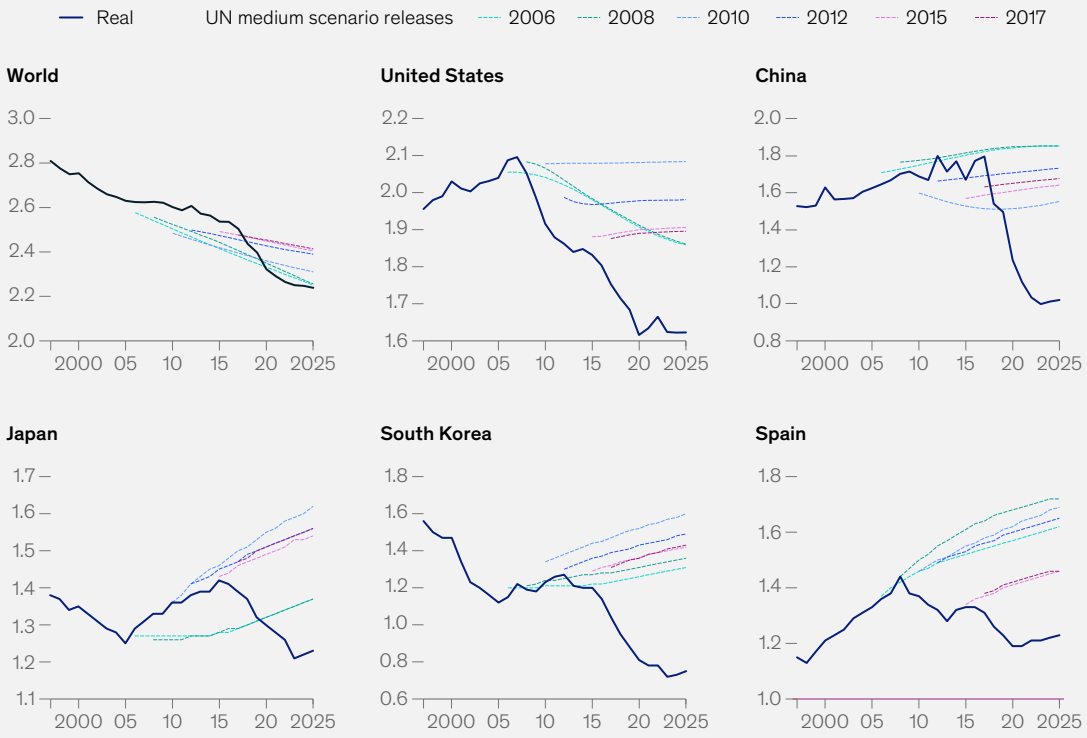
Another important variable that UN projections cannot account for is changes to migration patterns. While fertility and longevity move slowly, migration can change suddenly due to changing economic conditions, conflict, or climate, among other factors, causing large swings in the evolution and location of populations that are extremely hard to predict.

All in all, we are confident that the direction of our insights is correct, useful, and relevant to policy makers, businesses, and individuals. At the same time, it is important to note that specific numbers quoted in this research may not reflect exactly how the future will unfold, and so the report should be read as a scenario to prepare for rather than a prediction.

Exhibit B

The UN medium scenario predicts the total fertility rate will plateau or even rebound in every release, but so far it keeps declining.

Fertility rate, real and UN medium scenario releases



Source: *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

Working-age populations will peak and fall in three waves

Working-age people account for the bulk of economic output, so their numbers relative to those of older and younger people determine a host of economic outcomes. All regions will see the share of working-age people in their populations decline, although at different paces and points in time. First wave regions are those already undergoing this change. Later wave regions, where the shift is just beginning to take hold or hasn't yet arrived, will experience a peak and subsequent decline in the share of working-age population in the future—in some cases, the near future.

Among first wave regions are predominantly developed economies—Advanced Asia, Central and Eastern Europe, North America, and Western Europe—and Greater China, which has lower GDP per capita than other first wave regions but shares their demographic characteristics.[8] These regions have an average total fertility rate of 1.2 children per woman today, and 67 percent of their combined population is working age, down from a high of 70 percent in 2010 (Exhibit 4). In aggregate, this cohort is rapidly shrinking in these regions, where the share of the working-age population is projected to drop to about 59 percent by 2050.

There are two later wave groups of regions. A second wave has just reached the shores of Emerging Asia, India, Latin America and the Caribbean, and the Middle East and North Africa. Their total fertility rate is 2.2, and 67 percent of their population is working age today. This wave is still gathering momentum, however, and will peak in the 2030s in aggregate.

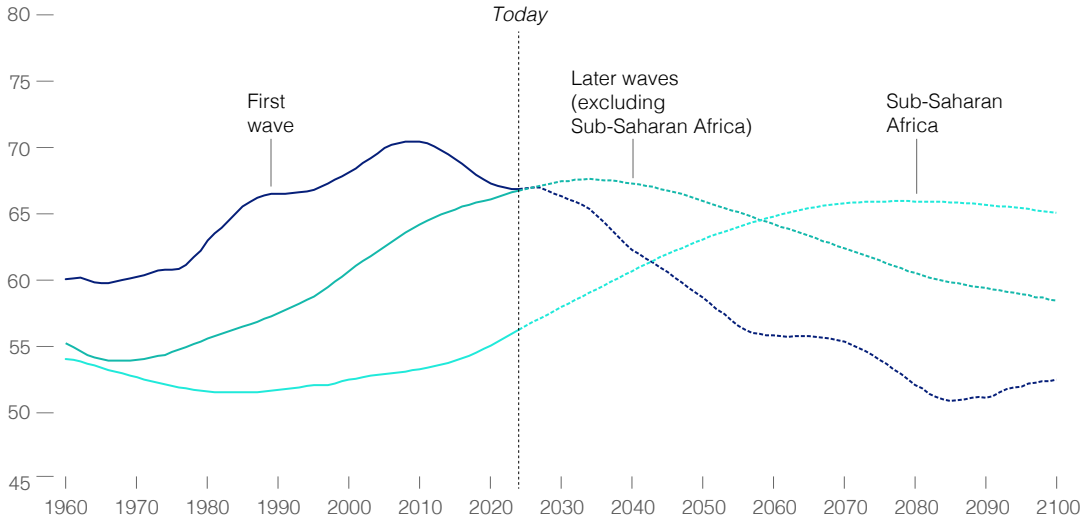
In Sub-Saharan Africa, the average fertility rate is 4.4 today, and just 56 percent of the population is working age. This share will continue to grow, peaking at 66 percent well into the second half of the century, when the third wave of the demographic shift hits its shores.

The three waves mask variations, and regions, countries, counties, and cities within them are at different stages of the demographic shift. For example, in the first wave, Germany's working-age population share peaked in 1986, while in the United States and China, it peaked in 2007 and 2010, respectively. China is projected to experience a sharper decline in its working-age population share in the future, given its lower fertility rate and lower migration. The United States and India measure fertility rates at a subnational level, providing examples of how birth rates vary even more within countries. (See sidebar "Fertility rates vary significantly across regions and within countries.")

Exhibit 4

Working-age populations peak in three waves.

Population aged 15–64 years, % of total population



Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

Sidebar: Fertility rates vary significantly across regions and within countries

Some large nations, such as the United States and India, monitor the total fertility rate at a subnational level, capturing this data by state (exhibit).

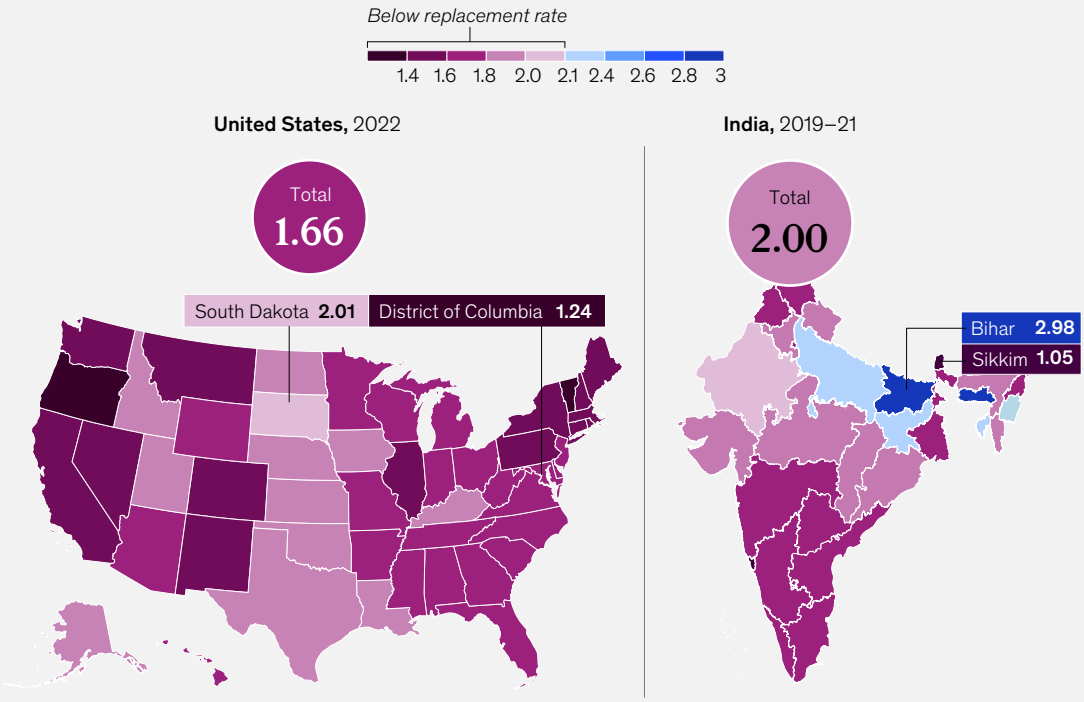
In the United States, the overall fertility rate is 1.66, according to the US Centers for Disease Control and Prevention. Rates vary by state: South Dakota has a fertility rate of 2.01, just slightly below the replacement level and comparable to that of Indonesia. Texas, the second-most-populous state, has a fertility rate of 1.84. By contrast, Vermont and Washington, DC, have fertility rates of 1.35 and 1.24, respectively, figures that are more comparable to those of Finland or Switzerland.

Fertility rates vary even more widely in India. While the national fertility rate stands at 1.98, below the replacement level, about a third of the population resides in states where fertility rates exceed replacement levels. Sikkim, the state with the lowest fertility, is at 1.05, according to the fifth National Family Health Survey. Conversely, Bihar has a fertility rate of 2.98, between Kenya and Botswana. Even within Indian states, fertility rates vary among populations, reflecting urban and rural differences. In Bihar, the urban fertility rate is 2.35, while the rural fertility rate is significantly higher, at 3.11. Thus, while fertility is a national issue for many countries, a subnational approach to addressing falling fertility rates may yield richer results.

Exhibit

Fertility rates vary significantly even within individual countries.

Total fertility rate by state, live births per woman



The boundaries and names shown on this map do not imply official endorsement or acceptance by McKinsey & Company.
Source: Centers for Disease Control and Prevention; National Family Health Survey (India); McKinsey Global Institute analysis

McKinsey & Company

Nevertheless, the broad momentum and peak of this population cohort in countries within each wave are similar, reflecting the horizons over which they will confront youth scarcity. For first wave regions, the declining share of working-age population is a relatively new development, and many companies, governments, and communities haven't yet fully come to grips with the implications. Later wave regions, excluding Sub-Saharan Africa, still have time to prepare, but not much.

Support ratios will continue to fall

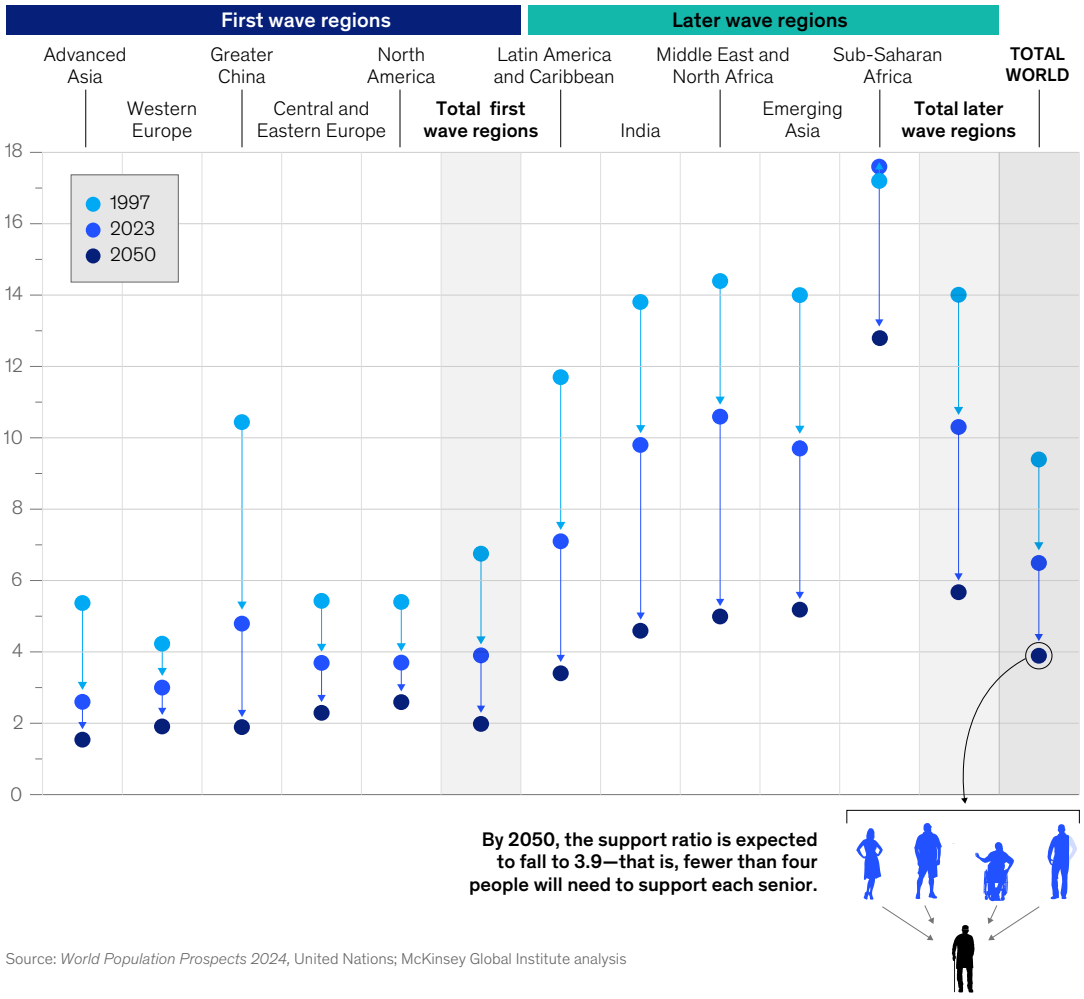
As the world becomes youth scarce, the number of workers per senior will fall. To illustrate this, we focus on the support ratio—the number of people aged 15 to 64 years, or those of working age, relative to the number 65 years and older.

Globally, the support ratio was 9.4 in 1997. Put differently, there were more than nine working-age people to support one older person (Exhibit 5).

Exhibit 5

Support ratios will decline rapidly across regions through 2050.

Support ratio, number of people 15–64 years old for each person 65 years and older, 1997–2050



Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

Today, the global support ratio is 6.5, and by 2050, it is expected to fall to 3.9—that is, fewer than four people to support each senior.

This trend is starker in first wave economies, where the support ratio is already 3.9 today, down from 6.8 in 1997. The ratio is expected to fall to two working-age individuals for every person over 65 years by 2050. Among regions in the first wave, Advanced Asia, Greater China, and Western Europe will have the lowest support ratios by 2050; the ratio will fall fastest in Greater China.

In later wave regions, the support ratio will decline from 10.3 today to 5.7 by 2050. India, where it is 9.8 today, offers a particularly stark example. In the country currently home to the world's largest population, the trajectory of birth rates and life expectancy indicates its support ratio will be roughly half what it is today by 2050 and drop to 1.9—about the same as Japan today—by 2100.

First wave countries' populations have already peaked

The world reached its maximum number of annual births in 2012, when 146 million babies were born, and the global number of births will continue to slowly decline. According to the United Nations, the total number of people on Earth will peak in 2084, at just above ten billion, and start declining in the latter years of this century.

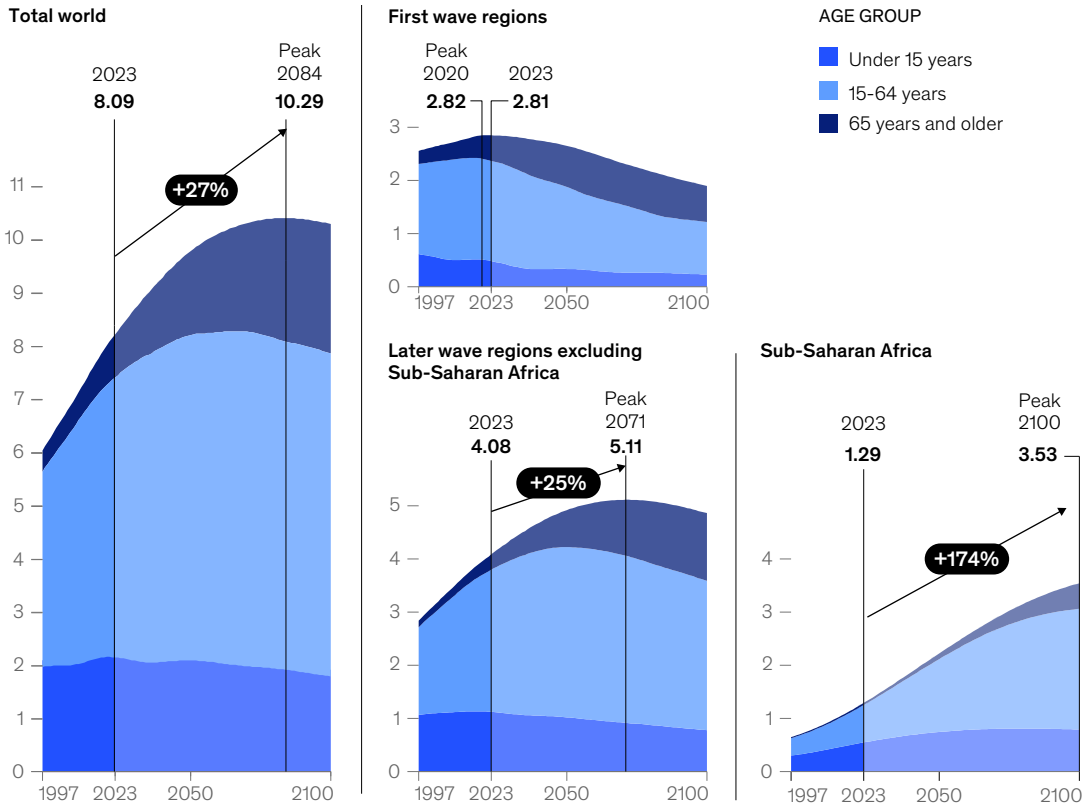
Total population in first wave regions, however, peaked in 2020. On the current trajectory, the population of these regions will fall from 2.8 billion today to 2.6 billion by 2050 and to 1.9 billion by 2100 (Exhibit 6). Only 22 of the 55 countries in these regions will have more people in 2050 than today, and populations in most of those countries will decline thereafter.[9] Already, more people die each year than are born in 37 countries in first wave regions. Today, 60 percent of the world's population aged 65 and older resides in these regions. By contrast, only 22 percent of those younger than 15 years live there.

Populations across later wave regions are still increasing. The second wave's total population will reach its maximum by 2071, going from four billion today to five billion at its peak. Sub-Saharan Africa's population will still be growing by the turn of the century and is projected to reach 3.5 billion by then, up from 1.3 billion today. (See sidebar "Predicting the future is hard, and demographers don't agree.")

Exhibit 6

World population is projected to peak at more than ten billion in 2084, but populations in first wave regions have already peaked.

Population, 1997–2100, billion



Source: *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

The population balance will shift decisively to later wave countries

These dynamics mean that the planet's population is shifting toward later wave regions. By 2050, a quarter of the global population will live in first wave regions, compared with 35 percent of the world's people today. According to UN projections, these regions could be home to less than 20 percent of the global population by 2100 (Exhibit 7).

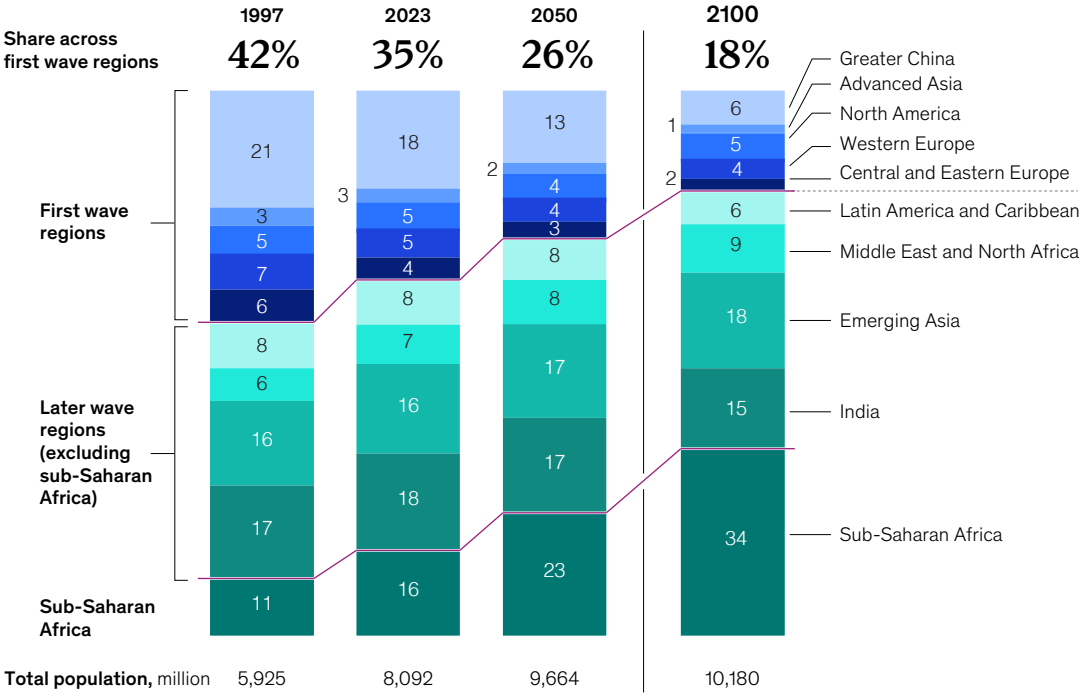
Even though Sub-Saharan Africa's fertility rate is falling fast, almost 300 of the world's next thousand babies will be born there. Nigeria alone will become home to 57 of the next thousand—or five more than the 52 born across Central, Eastern, and Western Europe combined. Similarly, 172 of the next thousand babies the stork delivers will be in India, where the birth rate overall has dropped below replacement but where the current population of women of childbearing age is still high.

By 2100, Sub-Saharan Africa will account for all of the net global population increase, doubling its current share to 34 percent.[10] By contrast, Greater China's share of the global population, today the second largest among the ten regions, will shrink by two-thirds, from 18 percent in 2023 to 6 percent by 2100. This would make Greater China's population only 170 million larger than North America's, according to UN estimates, compared with a difference of roughly one billion people today.

Exhibit 7

By 2100, less than 20 percent of the world's population will live in first wave regions.

Share of total population by region, %



Source: *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

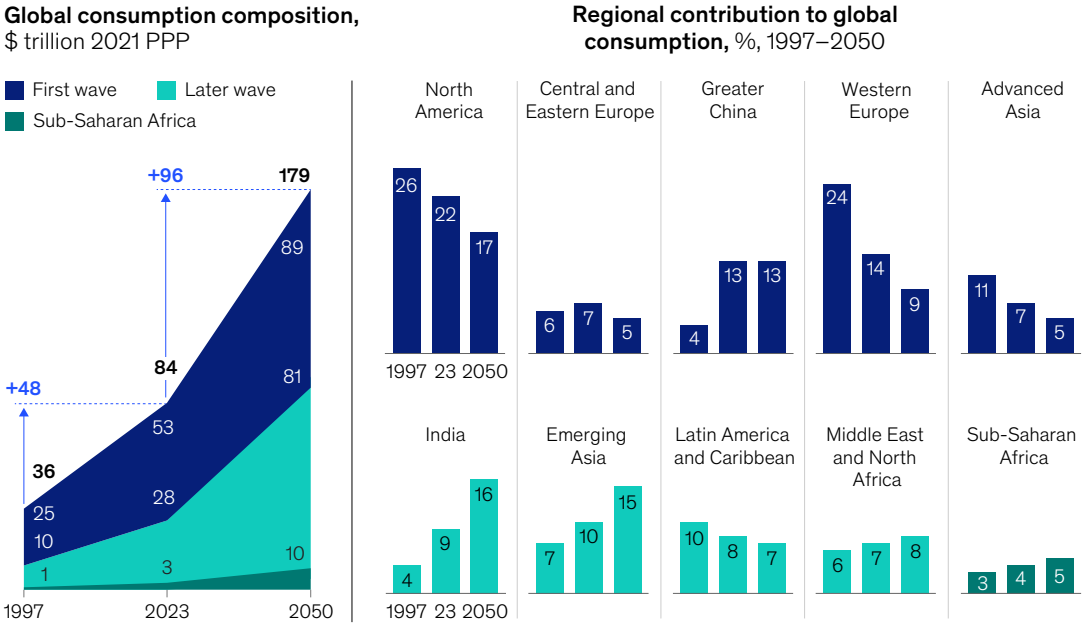
Labor markets are expected to shift accordingly to young and growing countries in later wave regions unless migration patterns change dramatically, a trend we explore in greater detail in subsequent chapters. By 2050, holding current hours worked per capita constant within each age group, later wave regions would account for more than two-thirds of all hours worked globally.

At that time, Sub-Saharan Africa alone could account for 18 percent of global hours worked, doubling its share of work hours today. The share of the world's work done by Chinese workers, on the other hand, could drop to 18 percent by 2050 from 26 percent today, and every other first wave region's share is set to shrink.[11] This could create an opportunity for many later wave countries to progress economically. Opportunities span the entire tradeable economy—services as well as manufacturing.

At least for the next quarter century, countries in later wave regions will account for more than half of global consumption, too, due to fast-growing young populations and growing incomes. For example, World Data Lab projects that India and Emerging Asia will account for 30 percent of global consumption at purchasing-power parity (PPP), up from 12 percent in 1997. By comparison, Advanced Asia, North America, and Western Europe could account for just 30 percent of the world's consumption then, down from 60 percent in 1997 (Exhibit 8).[12]

Exhibit 8

Consumption pools are shifting from North America and Western Europe to Emerging Asia and India.



Note: Consumption estimates from World Data Lab include both demographic effects and projected increases in per capita consumption (income effects). Only direct consumption is included; in-kind consumption from governments is excluded. Figures may not sum, because of rounding.
Source: World Data Lab; McKinsey Global Institute analysis

McKinsey & Company

This shift has important implications for many businesses in first wave and later wave regions alike as they develop and scale products to serve growing markets. As income and consumption grow in later wave regions, local and multinational companies will need to determine how to best meet changing local tastes and adapt their products and services accordingly. Affordability may increase in importance as consumers in later wave regions present a bigger market opportunity for businesses. Navigating as a business may become more complex, as many later wave countries have more challenging legal and governance environments and are more conflict prone.[13]

Prospects of depopulation put the focus on fertility rates

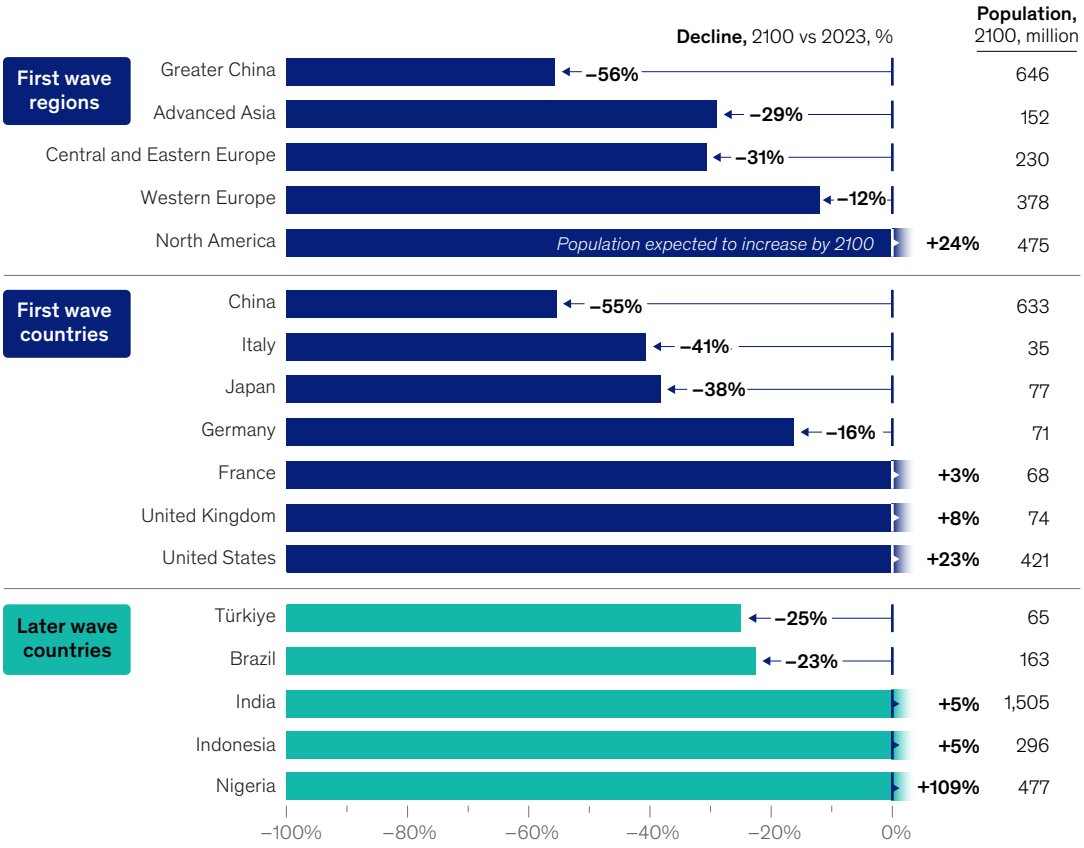
Over the longer term, countries in first wave regions may face the challenge of depopulation (Exhibit 9).[14] Populations in 26 countries in these regions are on track to decline by a third or more by 2100, while in countries including China, Poland, and South Korea, they are expected shrink by half or more. Projections suggest that some countries with fertility rates below replacement, including France, the United Kingdom, and the United States, will have continued population growth through 2100 based on positive net migration.

Smaller populations could affect many sectors of the economy as the number of children born dwindles. If a country had a constant fertility rate of 0.7, equivalent to South Korea's rate today, it would have just 13 grandchildren per 100 grandparents two generations from now. Just imagine school systems needing to adjust to a precipitous drop in the number of students, resulting in closing schools and extended travel distances. Declining populations would also challenge debt sustainability and the social contract, not to mention the global geopolitical balance. While some contend that smaller populations could reduce carbon emissions, MGI research has found that

Exhibit 9

Based on current projections of fertility and longevity, many countries are headed toward population collapse by 2100.

Population decline, 2100 versus 2023, %



Source: *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

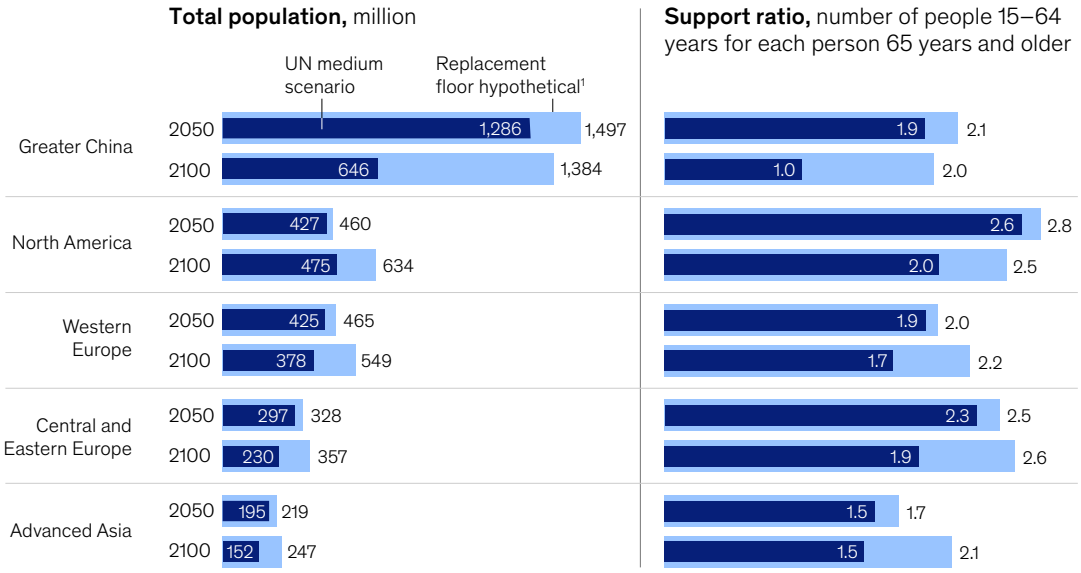
sustained economic growth is essential to pay for the net-zero transition—and this may come into question if populations shrink.

How different would first wave regions look in 2050 and 2100 if fertility rebounded? We developed what we call the "replacement floor hypothetical," which assumes that countries with fertility rates below the replacement rate today achieve a replacement-level fertility rate of 2.1 births per woman starting in 2024 and for every subsequent year. While this outcome is highly unlikely, it is an informative way to think about an alternative future.

Changing fertility rates don't have an immediate effect, although due to compounding, having more children today under any scenario would have a big impact over the longer term. Under the UN medium scenario, the global population would reach 9.6 billion by 2050, while it would climb to 10.2 billion under our replacement floor hypothetical over the same period. By 2100, populations under the two scenarios would grow to 10.2 billion and 12.6 billion, respectively. In Advanced Asia, achieving our hypothetical would lead to a population of 247 million in 2100, more than 1.6 times the population expected under the UN medium scenario (Exhibit 10).

Exhibit 10

Raising fertility rates today to match the replacement rate could increase populations and support ratios by 2050 and 2100.



[1] "Replacement floor hypothetical" is a case we developed that assumes countries with fertility rates below the replacement rate of 2.1 children for every woman in 2024 immediately achieve that fertility rate.
Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

Support ratios would also remain significantly higher, although still lower compared with today. By 2100, support ratios in first wave regions would level out at about 2.2 people of working age per senior, compared with a ratio of 1.4 under the UN medium scenario. In Western Europe, for example, the support ratio would increase from a projected 1.7 under the UN scenario to 2.2 under our hypothetical.

Increasing fertility rates, which traditionally fall as national income and female labor force participation rates rise, can be challenging. There are no clear examples of countries successfully boosting their birth rates significantly, although many are trying. For instance, the South Korean government has underwritten postpartum care centers in an effort to make childbirth as trouble-free as possible.[15] Hungary offers one-time cash incentives to new parents and spends almost 6 percent of its GDP on fertility and family programs overall.[16] Several Western European countries have extended family leave policies; Norway, for instance, covers the incomes of new parents up to a maximum of 49 weeks set by its welfare system, and many Norwegian employers choose to cover any gap in income to maintain full salaries.[17] Despite these efforts, none of these countries has managed to push fertility rates back to the replacement level, although each initiative offers insights about what does and does not work to influence fertility rates over the longer term.[18] Research tracking these efforts suggests that, on their own, policies that have been implemented and evaluated in high-income countries to date are unlikely to lead to substantial or sustained increases to the birth rate.[19]

Regardless, any children born over the next few decades will not enter the workforce right away. Thus, even as countries consider steps to address population decline in the long term, they need to adapt to demographic shifts over the next two decades—the die has already been cast.

2. A lower-growth, higher-dependency future in first wave regions

Many first wave economies face a virtually unprecedented depopulation challenge toward the end of the century, according to UN projections. More immediately, they face another challenge: increasing dependency that could depress economic growth over the next quarter century. As population pyramids become bottom-light and top-heavy, the well-being of a growing legion of older people and of society at large will depend on a stagnant or shrinking number of people who work, which will increase pressure on public finances. Youth scarcity could also modify consumption and savings patterns.

In this chapter, we begin by analyzing the consequences of the demographic shift on labor markets and on GDP per capita growth by 2050 in first wave regions (chapter 2.1). Our findings are not projections: we have taken an all-else-being-equal approach, keeping all variables constant except the demographic structures, or age mix, of economies.

A combination of three levers—higher labor intensity, more robust productivity growth, and shifts toward a younger age mix via higher fertility and effective migration—can offset the headwinds of the youth deficit (chapter 2.2). In many countries in first wave regions, however, no one of those levers alone can sustain past GDP per capita growth rates.

We then examine what could happen to savings trends and public finances (chapter 2.3). Finally, we examine changes in labor and consumption patterns that businesses may face and consider how they can respond (chapter 2.4).

2.1

2.1. Demographic shifts, slower economic growth

People typically work less as they get older, so the shifting demographic trends we've mapped could slow economic growth. GDP per capita depends on the number of hours worked per person and how productive each hour of work is, or productivity. Hours worked, in turn, depend on how much individuals of each age work, or labor intensity, and the number of people in each age group, or the age mix. Thus, GDP per capita growth depends on productivity growth, shifts in the age mix, and growth in labor intensity among people in each age cohort.

Under current projections, a changing age mix—more older people and fewer working-age people—will result in slower growth in hours worked and thus reduce GDP per capita growth if left unaddressed. In this section, we analyze the consequences of this shifting age mix on the growth in hours worked per person. Throughout, we assume that labor intensity in each age group remains constant at 2023 levels (see sidebar "Our approach to sizing the impact of demographic changes and how to counteract them").

To maintain GDP per capita growth, countries will need to influence their age mix, increase labor intensity, or boost productivity growth—or, more likely, rely on a combination of all three. In the following section, we analyze how much these three levers would need to be pulled in order to maintain GDP per capita growth at the same rate recorded over the past 25 years.

Sidebar: Our approach to sizing the impact of demographic changes and how to counteract them

GDP per capita growth depends on growth in productivity—the value of output produced per hour of work—and growth in hours worked per person. The latter, in turn, depends on labor intensity growth in each age group and changes in the age mix. Labor intensity is driven by the share of the population that seeks work (the labor force participation rate), the share of those who find employment, and the number of hours each worker works. The age mix depends on fertility rates, longevity, and migration flows. Productivity growth is driven by physical and human capital investments as well as the rate of innovation.

Take Western Europe as an example (exhibit). As more women and older people joined the labor force there, labor intensity grew by 0.4 percent on average annually from 1997 to 2023. However, as the region's age pyramid skewed older, primarily due to falling fertility rates, the changing age mix reduced economic growth by 0.3 percent per year. Productivity grew by 0.8 percent per year. Combined, the three components brought overall GDP per capita growth to 1 percent a year.

As the number of older people whose labor intensity is low increases and middle-aged cohorts with high labor intensity shrink, the age mix will increasingly depress growth, absent changes. Thus, labor intensity or productivity will have to grow faster to maintain past GDP per capita growth, or the age mix will need to shift in ways that differ from current UN projections via changes in fertility rates or migration.

We aim to answer two questions in the first two sections of chapter 2:

1. How much will the change in the age mix projected under the UN medium scenario decrease growth in hours worked per capita and thus GDP per capita growth (chapter 2.1)?
2. What changes in productivity, labor intensity, or the age mix would be necessary to maintain past GDP per capita growth (chapter 2.2)?

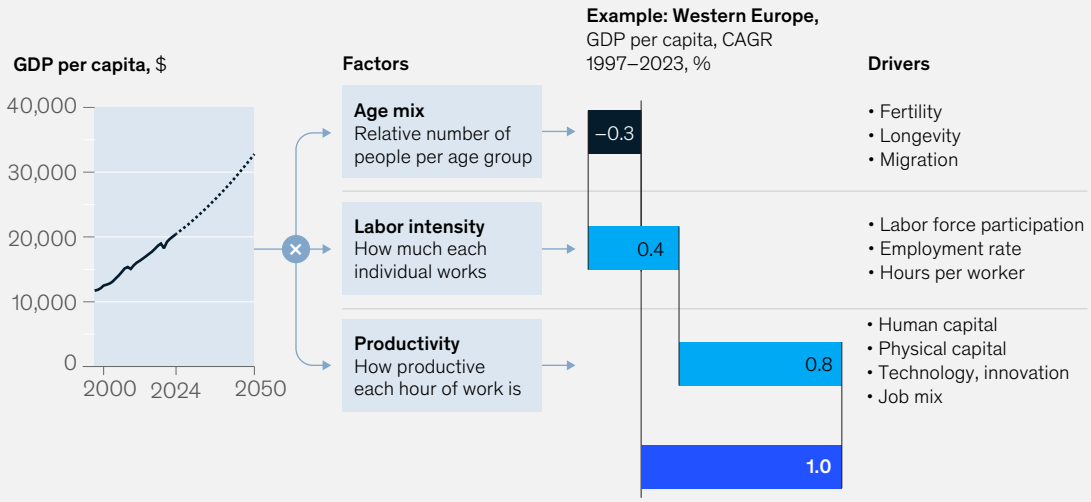
In chapter 2.1, we size the impact of the age mix on the growth of hours per capita. We hold the other component that drives hours, labor intensity per age group, constant at 2023 levels.

In chapter 2.2, we consider target GDP per capita growth, which is the average annual growth in a country or region over the past 25 years, and size the changes needed in productivity growth and labor intensity to maintain that growth, given the drag of the baseline age mix calculated in chapter 2.1. In only two countries does the target we use differ from their average 1997–2023 GDP per capita growth: China and South Korea. In 1997, these countries were emerging economies, so targeting their high past growth would be unrealistic. Instead, we calculated new targets for them based on the growth trajectory of economies that developed earlier. The GDP per capita

Exhibit

What drives GDP per capita growth?

Factors driving GDP per capita growth, 1997–2023



Source: *World Population Prospects 2024,* United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

Sidebar: Our approach to sizing the impact of demographic changes and how to counteract them (continued)

growth target for China is 4.9 percent per year, while that of South Korea is 2.0 percent.

Many combinations of labor intensity and productivity growth could result in the same GDP per capita growth, so we show two of these combinations: the required increase in labor intensity if past productivity growth remains constant, and the required annual productivity growth if past hours per capita growth remains constant.

Returning to the example of Western Europe, average GDP per capita growth in the past quarter century was 1 percent per year, which we use as the target for future growth. The region's age mix will drag growth down by 0.4 percent a year. Holding past productivity growth constant at 0.8 percent, labor intensity would need to grow by 0.6 percent annually to meet the GDP per capita growth target. By contrast, holding hours per capita growth constant at 0.2 percent, future productivity needs to grow by 1.2 percent annually to meet the target.

Additional migration changes the age mix and thus affects average weekly hours worked per capita, so we separately calculate how many additional migrants would be needed to reach the required increase in hours, assuming past productivity growth stays constant.

Labor intensity declines at older ages—before official retirement

Labor intensity, measured as weekly hours worked per person in an age group, starts declining everywhere before official retirement ages. Across first wave regions, weekly hours worked per capita peak at about 50 years of age and decline thereafter (Exhibit 11). The primary reason is falling labor force participation rates—fewer older people continue to work—but on average, older workers who are employed also work fewer hours.

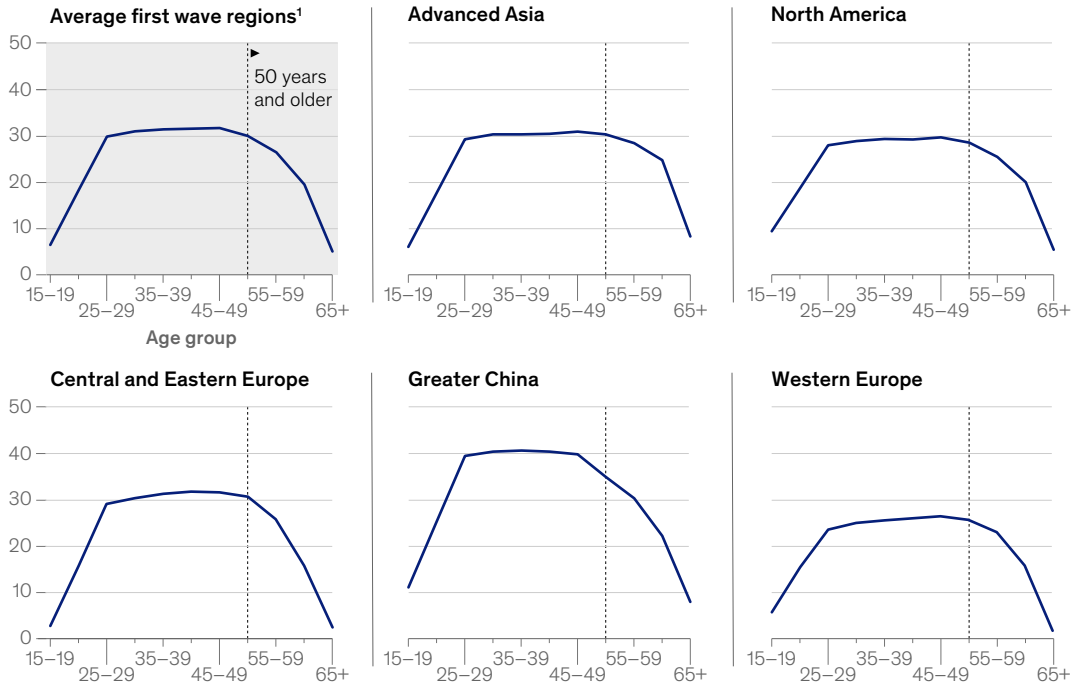
In Germany, for instance, people aged 25 to 54 years work 25 hours per capita a week, on average, while those aged 55 to 64 years work 21 hours a week.[20] Among Germans who are 65 years and older, this plummets to an average of two hours per capita per week—that is, two hours per person, including those who aren't in the labor force. The rapid decline of hours per capita reflects two trends: lower *participation* in the labor force and *less intensity* among those who do work—but the net effect is what matters for an economy.

Japan, a society with more older people, has more older workers, but labor intensity there still declines with age: Japanese between 25 and 64 years work 30 hours on average, and those 65 years and older work seven hours (see sidebar "Learning from Japan").

Exhibit 11

Labor intensity starts declining when workers are in their 50s.

Weekly hours per capita over a life cycle, 2023



Note: Hours per capita takes into account the entire population in each age group, not just workers.
[1]Simple average of first wave regions.
Source: ILOSTAT; *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

Sidebar: Learning from Japan

Countries within waves are not all aging at the same pace. Japan's fertility rate fell earlier than the rates of its first wave peers, and its average life expectancy at birth is the highest in the world at 84 years. In 2005, 20 percent of its population was 65 years and older, and today that age cohort makes up 30 percent of the Japanese population.

Projections suggest that the United States will be as old as Japan is today after 2100. France could reach this milestone in 2079, China in 2047, and Spain in 2037. This makes Japan an interesting case study and raises the question: What can other first wave countries learn from Japan?

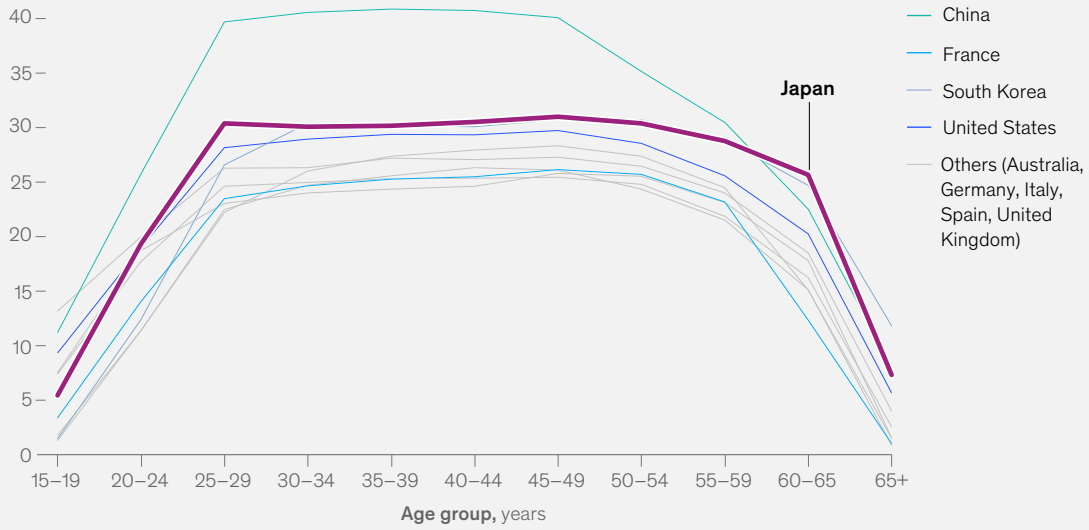
The first lesson is that as support ratios decline, labor intensity must rise—fewer working-age people means that, all else being equal, others may need to work more to sustain economic growth. Japan's labor intensity is higher than that of virtually all other developed countries, and even more so at older ages (exhibit). The labor force participation rate among Japanese aged 50 to 65 years is 84 percent, up from 73 percent in 1997. Among people 65 years and older, it is 26 percent, compared with 19 percent in the United States and 4 percent in France.

The second lesson Japan offers is that higher labor intensity alone may not be enough. Japan's annual labor productivity has grown 1.1 percent per year, on average, since 1997, faster than the 0.8 percent increase in Western Europe and somewhat less than the 1.5 percent growth in the United States. Yet Japan's GDP per capita has grown just 0.6 percent, compared with 1 percent in Western Europe and 1.4 percent in the United States.[1] The demographic drag is inexorable and severe, and when it hits, boosting productivity growth becomes even more relevant.

Exhibit

Japanese people work more hours, on average, than people in most other first wave economies.

Weekly hours per capita over a life cycle, 2023



Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

[1] For a discussion of the impact of demographics on Japan's economic growth, see Jesús Fernández-Villaverde, Gustavo Ventura, and Wen Yao, *The wealth of working nations*, National Bureau of Economic Research working paper number 31914, November 2023.

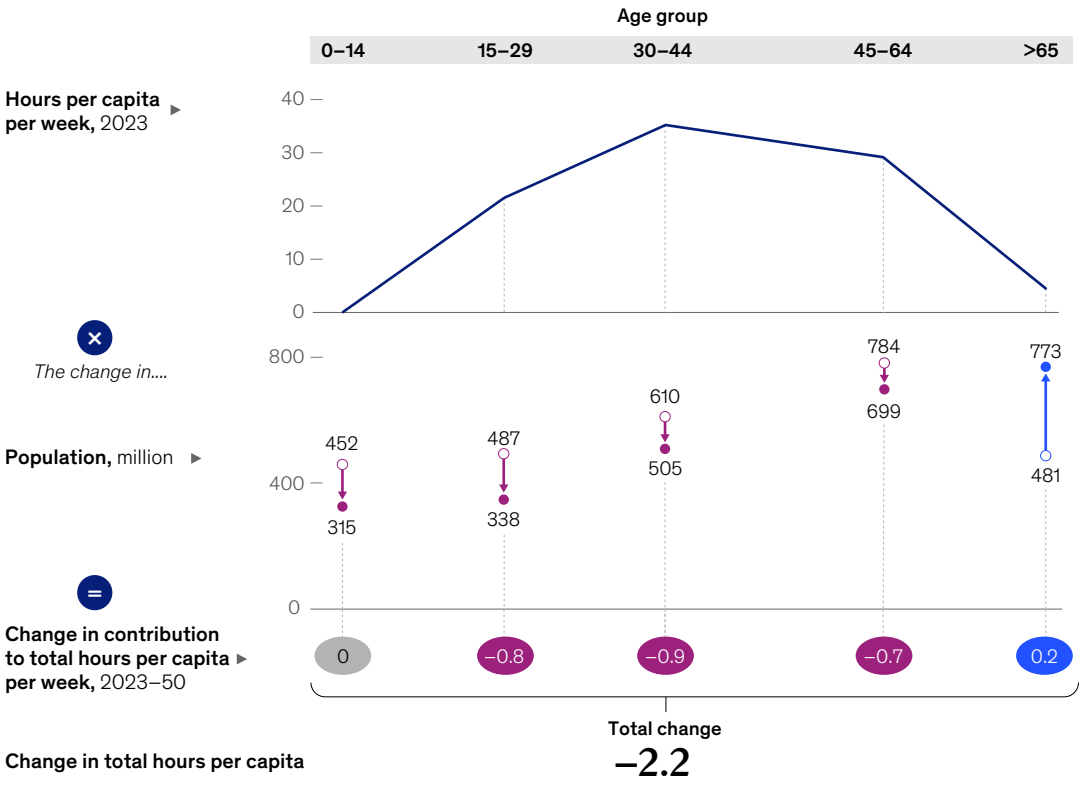
Fewer hours worked will depress economic growth

Because labor intensity declines with age, a future with fewer young and middle-aged people and more older people will mean lower growth in hours per capita per week, or labor intensity, all else being equal. From 1997 to 2023, the cohort aged 65 years and older was the fastest-growing age group in every first wave region. But the number of working-age people also increased in many first wave countries. The number of children younger than 15 years fell, a reflection of declining fertility rates. This combination helped partially balance the age mix for a while, diminishing the impact of increasingly aged populations. However, over the coming 25 years, the number of older people living in first wave regions will continue to grow while every other age cohort shrinks. This shift in the age mix could slow the growth in hours worked per capita across first wave regions by 2.2 hours per capita per week on average, thus slowing GDP per capita growth (Exhibit 12).

Exhibit 12

Demographic headwinds will be a drag on hours per capita.

Contribution to hours per capita decline by age group, first wave economies



Note: Figures may not sum to 100%, because of rounding.
Source: ILOSTAT; *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

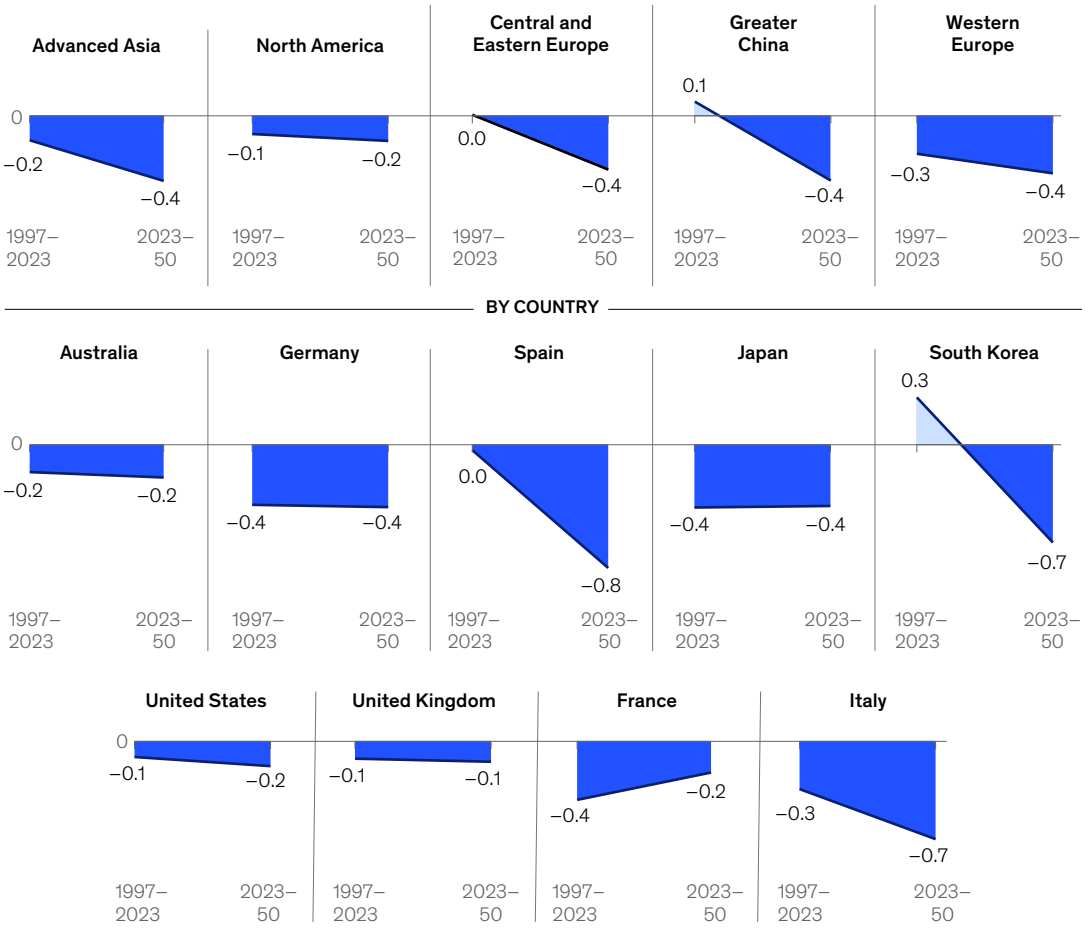
McKinsey & Company

From 1997 to 2023, the age mix effect was neutral or slightly negative across first wave regions, dragging down hours of work per capita by a negligible amount. Over the next quarter century, the age mix will slow the growth in hours per capita per week—and thus GDP per capita growth—by 0.4 percent annually in every first wave region other than North America (Exhibit 13). This is equivalent to a cumulative reduction in hours per capita per week of 2.2 hours across first wave economies from 2023 to 2050, ranging from 0.8 to 2.6 in different regions. A 0.4 percent drag on GDP per capita growth per year may seem trifling, but it isn't. The shift in age mix could slow GDP per capita growth over the next quarter century, for example, by an average of $10,000 in Western Europe and $6,000 in Greater China.

Exhibit 13

Demographic shifts will slow GDP per capita growth across first wave economies.

Contribution of age mix shift to hours per capita growth, 1997–2023 vs 2023–50, %



Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

Naturally, regional averages hide country variation. For instance, the effect of the demographic shift is already apparent in Australia, where a changing age mix has decreased weekly hours and GDP per capita growth by an average 0.2 percent per year over the past quarter century, a decrease forecast to continue at the same pace to 2050. Spain offers a particularly extreme example of the age mix effect. While it was neutral from 1997 to 2023, age mix could deduct 2.8 hours per capita per week, or 0.8 percent of annual GDP per capita growth to 2050.

More women and older people working—and productivity—have supported past growth

Before turning to changes needed in future labor intensity and productivity growth if GDP per capita is to be maintained, it is worth asking how they have evolved in the past.

Aggregate labor intensity increased in Western Europe from 1997 to 2023 and declined in Greater China and Advanced Asia (Exhibit 14). It remained flat on average in North America and Central and Eastern Europe.

But the labor intensity of two groups—women and older people—grew consistently in almost every region.

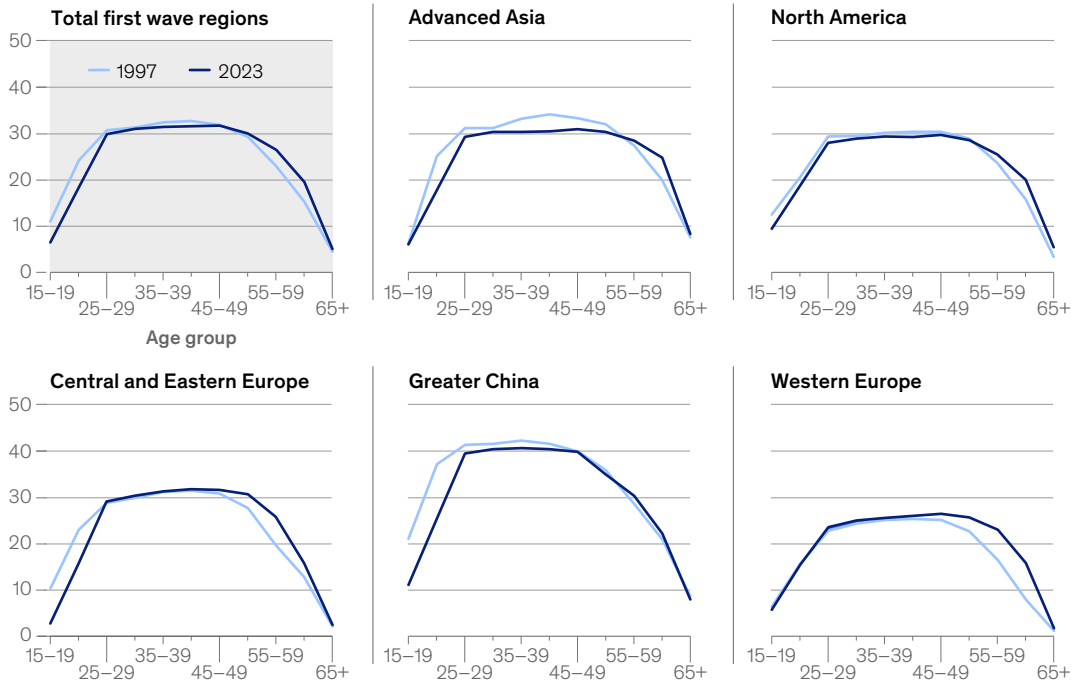
Those 50 years and older increased their participation in labor markets everywhere. This effect was most pronounced in Europe but apparent in every region, even in Advanced Asia, where labor intensity overall declined. Second, women aged 25 and older—particularly older women—worked more. This was true in every region except Greater China, where women's labor intensity did not change. In Advanced Asia overall, labor intensity grew, though it fell slightly among women aged 35 to 50 years.

Despite increased labor intensity among those older than 50 years and women in most first wave regions over the past quarter century, most regions had stagnant or falling aggregate labor intensity, largely because fewer people younger than 29 years worked. Western Europe was the only first wave region where overall labor intensity not only increased but more than completely offset the negative impact of the changing age mix.

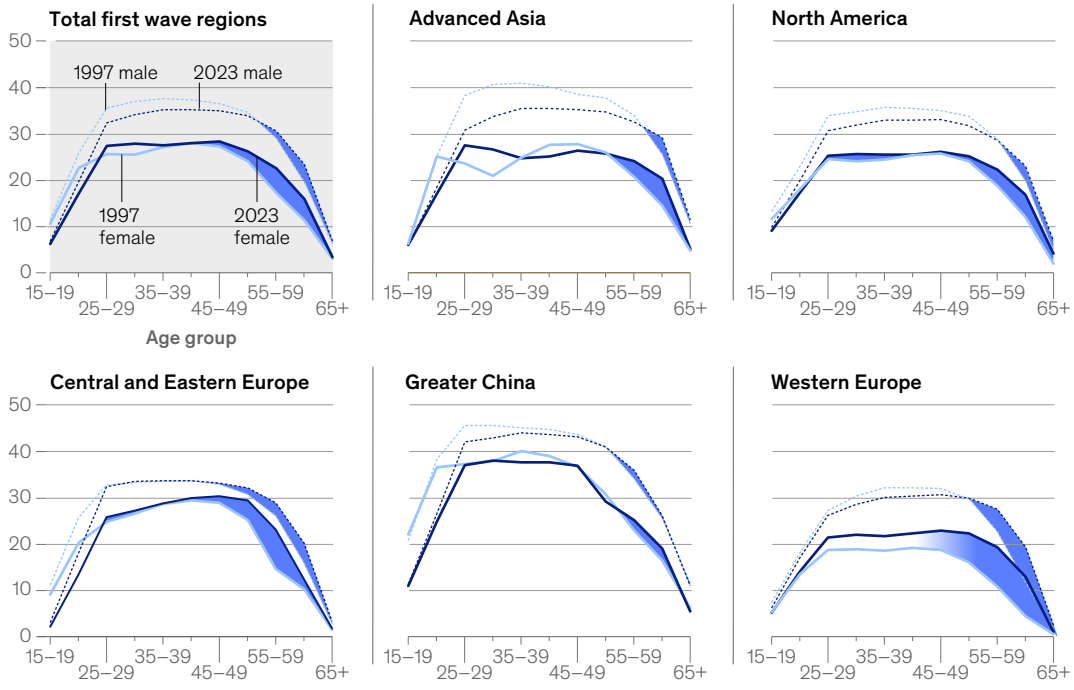
Exhibit 14

How has labor intensity evolved?

Weekly hours per capita over a life cycle, 1997 and 2023



Weekly hours per capita over a life cycle, by sex, 1997 and 2023



Note: Hours per capita takes into account the entire population in each age group, not just workers.
Source: ILOSTAT; *World Population Prospects 2024,* United Nations; McKinsey Global Institute analysis

McKinsey & Company

Spain once again offers an interesting and extreme example of the impact of labor intensity on economic growth. Overall, weekly hours per capita there grew by an average 0.5 percent per year from 1997 to 2023, boosting GDP per capita growth by the same amount. The age mix shift did not add to or subtract from growth, meaning all additional hours worked were the result of increased labor intensity. But Spain, like other countries, not only will see a growing drag from the age mix, but may also struggle to sustain the very high growth in labor intensity of the recent past. Over the past quarter century, labor force participation among working-age females in Spain jumped from 60 to 81 percent, an unrepeatable acceleration. Additionally, weekly hours per Spanish worker—those already in the workforce—have trended down for decades, and the country is currently discussing *reducing* the working week from 40 to 37.5 hours.[21]

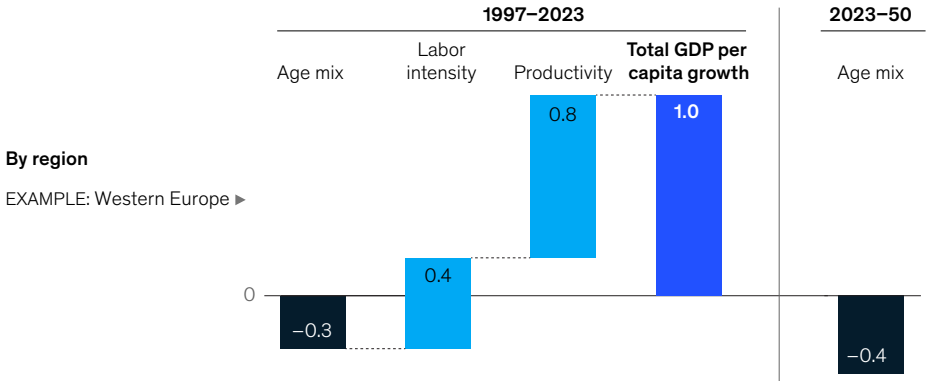
Productivity growth is the other lever underpinning GDP per capita growth, and generally the most important one. Across first wave economies, it has been the largest contributor to growth over the past quarter century (Exhibit 15).

With demographics dragging down future GDP per capita growth, labor intensity, productivity, or the age mix will need to shift. By how much is the question we turn to next.

Exhibit 15

Productivity growth was the main driver of growth in GDP per capita in the past quarter century.

Contribution of drivers to GDP per capita growth, 1997–2023 and 2023–50, %



	Age mix	Labor intensity	Productivity	Total GDP per capita growth	Age mix
By region					
EXAMPLE: Western Europe ▶	–0.3	0.4	0.8	1.0	–0.4
Advanced Asia	–0.2	–0.2	1.7	1.4	–0.4
Central and Eastern Europe	0.0	0.0	3.1	3.1	–0.4
Greater China	0.1	–0.3	7.0	6.9	–0.4
North America	–0.1	0.0	1.5	1.3	–0.2
By country					
Australia	–0.2	0.2	1.5	1.5	–0.2
France	–0.4	0.5	0.8	0.9	–0.2
Germany	–0.4	0.6	0.9	1.1	–0.4
Italy	–0.3	0.4	0.3	0.4	–0.7
Japan	–0.4	0.0	1.1	0.6	–0.4
South Korea	0.3	–0.9	3.7	3.2	–0.7
Spain	0.0	0.5	0.6	1.1	–0.8
United Kingdom	–0.1	0.2	1.0	1.0	–0.1
United States	–0.1	0.0	1.5	1.4	–0.2

Note: Figures may not sum to 100%, because of rounding.
Source: ILOSTAT; *World Population Prospects 2024,* United Nations; The Conference Board; Oxford Economics; McKinsey Global Institute analysis

McKinsey & Company

2.2

2.2. More workers, more hours, and more productivity needed

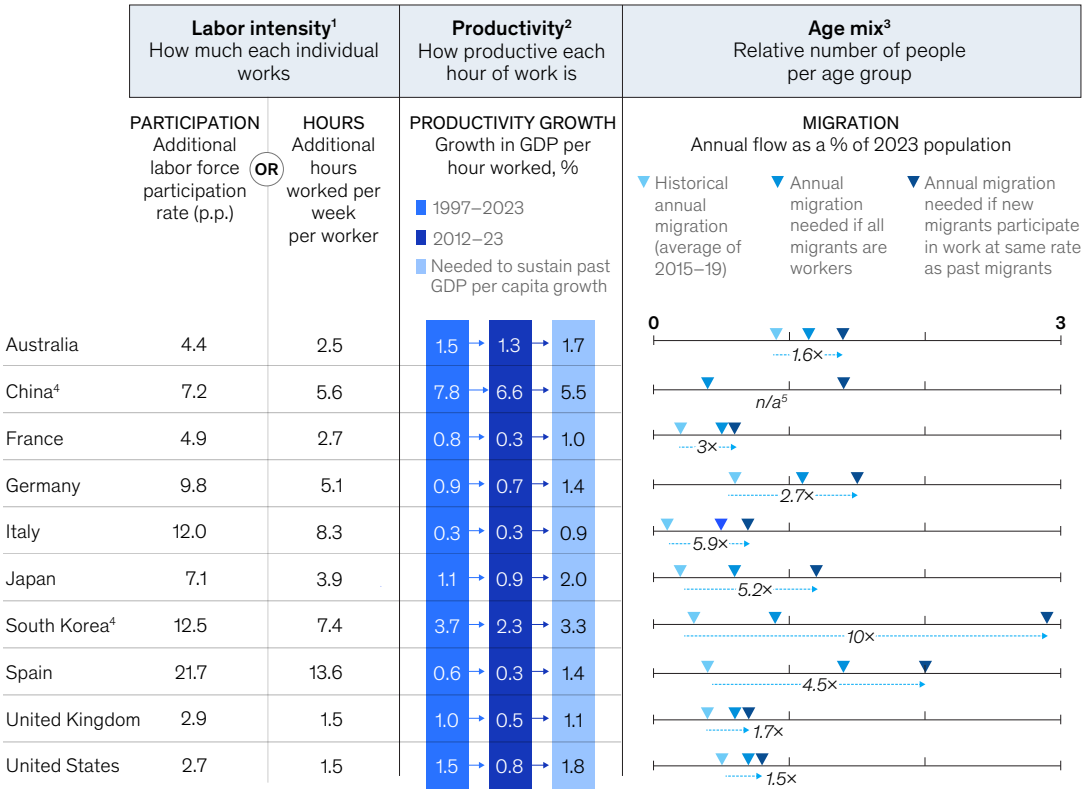
A growing youth deficit has already set first wave regions on a trajectory for declining hours of work per person and thus slower GDP per capita growth through 2050 compared with the past quarter century. Maintaining past economic progress, let alone increasing it, will require measures to address the impact of demographic headwinds. In this section, we explore the three levers available—labor intensity, productivity, and age mix—to neutralize the drag on economic growth caused by shifting age mix. The third lever, influencing the age mix by increasing the number of working-age people, can be pulled via migration and higher fertility. However, the impact of higher fertility rates by 2050 would be negligible, as a baby born today would be barely joining the workforce. So we only analyze the impact of migration here.

The conclusion is clear: pulling on only one of these three levers will be insufficient to achieve this goal in most countries, so using some combination of all three will be needed to maintain growth and raise living standards (Exhibit 16).

Exhibit 16

Changing the age mix, labor intensity, or productivity alone cannot sustain growth—a combination of all three is needed.

Change in age mix, labor intensity, or productivity growth needed to sustain GDP per capita growth in 2023–50



Note: Beyond migration, increasing fertility rates can shift the age mix and have positive effects on GDP per capita in the long run, but 2050 is too early to see the impacts.
[1]Assuming the same productivity growth as 1997–2023 continues. China and South Korea were less developed in 1997 and had very high productivity growth in the last quarter century; assuming constant productivity growth from the past would be unreasonable. For China, we assume productivity grows by 4.9%, in line with high-growth countries in the past, when they were at a similar development stage. For South Korea, we take the highest productivity growth across advanced economies in the last quarter century, 2.0%.
[2]Assuming the same hours per capita growth as 1997–2023 continues.
[3]Historical averages based on 2015–2019 (prepandemic) annual averages. Where available, historical numbers are cited from national statistics agencies (Australia, France, Germany, Spain, United Kingdom). United Nations estimates are used for the remaining countries (China, Italy, Japan, South Korea, US). Future migration required is calculated as the number of additional migrants required to maintain past growth if productivity growth remains constant.
[4]While "maintaining past GDP per capita growth" is a reasonable target for highly developed economies, China and South Korea were not as developed in 1997. Therefore, their GDP per capita growth targets are reduced, based on the trajectories followed in the past by other countries when they were at similar stages of development. China's target is 4.9% per year, while South Korea's is 2.0%.
[5]Historically, emigration has exceeded immigration in China, so needed migration cannot be expressed as a multiple of past migration.
Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

To size the degree to which each lever must be pulled to sustain GDP per capita growth, we continue to rely on the all-else-being-equal approach we used for the analysis in the preceding section. We consider a target GDP per capita growth rate for each country equal to its annual growth over the past 25 years in all countries other than China and South Korea. In those countries, we lowered the target, since replicating their past growth would be an unrealistically high goal given their much more advanced level of development today (see sidebar "Our approach to sizing the impact of demographic changes and how to counteract them").[22]

While the levers will likely need to be deployed in combination, each country can opt for a different "menu" of combinations, depending on its characteristics, opportunities, and challenges.

Both labor intensity *and* productivity must rise

The first lever, increasing labor intensity, will be key. We analyze the overall increase in labor intensity needed to maintain past GDP per capita growth as well as what it would take if the full lift were accomplished by just one of three population groups alone: males under 50 years of age, or "younger men"; females less than 50 years old, or "younger women"; and people older than 50 years, or "older people."

Consider Germany, where GDP per capita grew an average of 1.1 percent per year over the past quarter century. Productivity growth over that period was 0.9 percent annually. Changes in the German age mix going forward are expected to reduce that growth by 0.4 percentage point. This means the country will need to fill a gap in GDP per capita of 0.6 percentage point per year if past productivity growth is to persist, which translates into an overall increase in labor intensity of 2.2 more hours of work per capita per week, or 5.1 hours per worker. For any of the three cohorts—younger men, younger women, or older people—to achieve that on their own, weekly hours per capita would need to expand by 12.7 hours, 13.2 hours, and 6.1 hours, respectively by 2050 (Exhibit 17).

Hours per capita can in turn be increased in two ways: more people working—higher labor force participation—or more hours worked per worker in the labor force. While the latter is a possibility, recent trends in hours worked have gone in the opposite direction: German workers today work

Exhibit 17

The required increases in hours worked to sustain GDP per capita growth are large: Germany example.

Additional hours per capita per week needed in Germany by 2050 to sustain GDP per capita growth, hours[1]

[1]Calculated as the additional hours per capita per week required to offset the 2023–50 age mix effect (if negative) and maintain 1997–2023 hours growth (if positive). This is equivalent to maintaining past GDP per capita growth if productivity growth remains constant.
[2]Labor force participation among German men or women aged 20–49 would require an increase that would drive labor force participation levels over 100%, which is impossible.
Source: *World Population Prospects 2024,* United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

2.5 hours *less* per week on average than 25 years ago, and the country is testing a four-day work week, which would further reduce labor intensity.[23] Raising weekly hours worked by some groups, for example older people, may be feasible. Yet relying on only one cohort is challenging: if considering only existing workers, workers aged 50 to 79 would need to increase their weekly hours by 17.9 hours each, from an average of 27.0 hours today to 44.9 hours, to sustain past GDP per capita growth absent other changes.

Germany could also increase labor force participation, but the country already has one of the highest labor force participation rates in the world, at 90 percent among younger men and 81 percent of younger women. In fact, if the country were to rely solely on increasing labor force participation among these two cohorts to maintain past GDP per capita growth, younger workers' labor force participation would need to exceed 100 percent, which is impossible. Germany could raise the participation of older people, which today is at 45 percent. However, the increase needed would be large, 18 percentage points.

The German example illustrates how increasing labor intensity growth, while necessary, is unlikely to do the job of maintaining GDP per capita growth on its own. Some countries, such as Australia, the United Kingdom, and the United States, have a somewhat easier task, given their more favorable demographic prospects (Exhibit 18). Others, like China, Italy, South Korea, and Spain, have an even harder task than Germany. And keep in mind that this analysis depends on two important underlying assumptions. First, it assumes productivity growth continues to increase at the same rate, on average,

Exhibit 18

Some countries need to increase hours worked more than others to sustain past GDP per capita growth.

Additional hours per capita per week needed to sustain GDP per capita growth by 2050, hours[1]

		If worked only by...		
	All people	Males aged 20–49	Females aged 20–49	Older people aged 50–79
Total first wave	**2.2**	**12.5**	**13.6**	**5.6**
Australia	1.2	6.1	6.4	3.5
China[2]	2.7	15.2	17.4	6.1
France	1.1	6.2	6.3	3.5
Germany	2.2	12.7	13.2	6.1
Italy	2.7	16.7	17.9	6.9
Japan	1.8	9.1	11.9	4.7
South Korea[2]	3.4	24.4	24.3	7.4
Spain	4.7	29.1	29.7	12.0
United Kingdom	0.7	3.8	4.0	2.2
United States	0.7	3.7	4.0	2.3

[1]Calculated as the additional hours per capita per week required to offset the 2023–50 age mix effect (if negative) and maintain 1997–2023 hours growth (if positive). This is equivalent to maintaining past GDP per capita growth if productivity growth remains constant. China and South Korea were less developed in 1997 and had very high productivity growth in the last quarter century; assuming constant productivity growth from the past would be unreasonable. For China, we assume productivity grows by 4.9 percent, in line with high-growth countries in the past, when they were at a similar development stage. For South Korea, we take the highest productivity growth across advanced economies in the last quarter century, 2.0%.
[2]While "maintaining past GDP per capita growth" is a reasonable target for highly developed economies, China and South Korea were not as developed in 1997. Therefore, their GDP per capita growth targets are reduced, based on the trajectories followed in the past by other countries when they were at similar stages of development. China's target is 4.9% per year, while South Korea's is 2.0%.
Source: *World Population Prospects 2024,* United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

as it did over the past 25 years. In a scenario with lower productivity growth, the growth in labor intensity needed would be even bigger, whereas if productivity growth increases, it would be smaller.

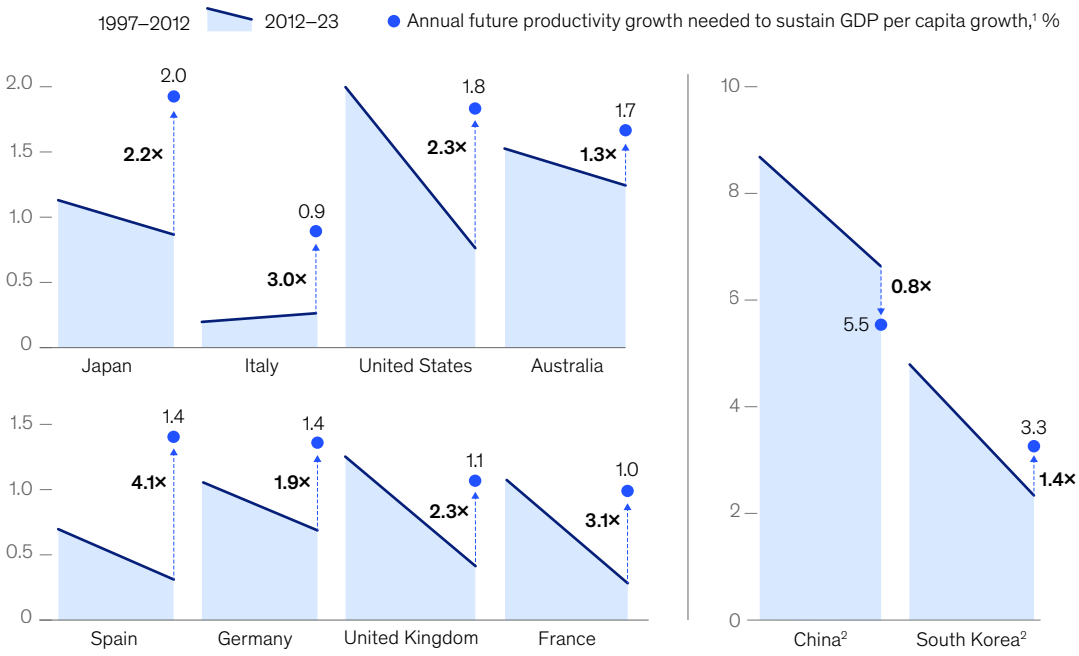
Second, the target for each country is equal to its past GDP per capita growth, which in many cases is not high. Italy's target, for example, is a mere 0.4 percent annual growth. Should Italy want to achieve a healthier GDP per capita growth of, say, 1.5 percent, similar to that of the United States or Australia, the growth in hours per capita required would jump from 2.7 to a whopping 7.9, assuming constant past productivity growth of 0.3 percent per year.

Given the big, and in some cases unfeasible, requirements for increased labor intensity, countries also need to find ways to propel productivity growth, the second key lever. Assuming hours worked per capita grow at the same rate as in the past quarter century, productivity in most first wave countries would need to grow between 1 and 2 percent a year to maintain past GDP per capita growth (Exhibit 19). That level of increase may seem modest, but in Germany, for example, it means doubling the past decade's average rate of annual productivity growth of 0.7 percent. In Spain, productivity growth needs to increase by about four times, even assuming labor intensity grows at past rates. If labor intensity does not increase—a plausible scenario—productivity in Germany and Spain would need to grow by 1.5 percent and 1.9 percent, respectively, per year.

Exhibit 19

Productivity growth would have to accelerate substantially to match GDP per capita growth rates from 1997 to 2023.

Productivity growth, %



[1]Assuming the same hours per capita growth as 1997–2023. Calculated for first 8 countries displayed as the percentage of annual growth in productivity needed to offset the 2023–50 impact of aging (if negative) and maintain GDP per capita growth matching 1997–2023 (if positive). For China and South Korea, calculated as the productivity growth needed to achieve 4.9% and 2.0% annual GDP per capita growth, respectively. While "maintaining past GDP per capita growth" is a reasonable target for highly developed economies, China and South Korea were not as developed in 1997. Therefore, their GDP per capita growth targets are reduced, based on the trajectories followed in the past by other countries when they were at similar stages of development.
Source: *World Population Prospects 2024,* United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

While productivity can grow by raising capital investment and harnessing digital and automation technologies, most first wave countries have long struggled to do so.[24] In fact, productivity growth has slowed in many of those countries over the past decade. For instance, US productivity over the past decade grew 0.8 percent per year on average, much less than its earlier annual growth of 2.0 percent.

From the beginning of 2023 through the second quarter of 2024, productivity growth spiked in the United States to top 2 percent per year, while it flatlined in many Western European countries and Australia. This suggests that the United States may be better positioned to jump-start growth, although that remains an open question. The future holds opportunities and risks for productivity growth everywhere. For example, while AI promises to propel productivity, increasingly fragmented global value chains and the growth of traditionally low-productivity service sectors like healthcare due to increasing longevity could restrain productivity growth.[25]

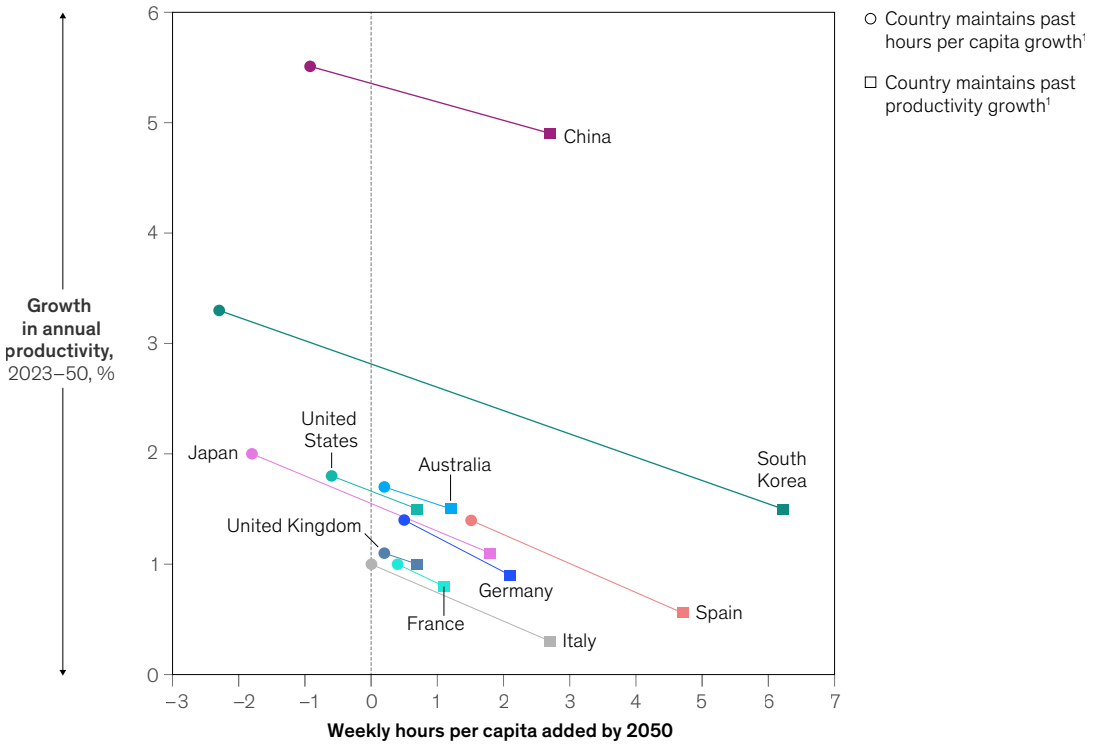
China faces a special challenge. It is a first wave country because of its current demographic profile, but its GDP per capita of $21,000 (after adjusting for purchasing power) is closer to that of later wave regions. The country's population is aging faster than almost anywhere else on Earth due to its low and declining fertility rate. To achieve a 4.9 percent growth target, China would need to grow its productivity by 5.5 percent a year, on average, through 2050 to counteract the demographic shift. This target is challenging, though not unattainable. While Chinese annual productivity growth over the past quarter century has been impressive, above 8 percent, it has slowed down more recently. Since the pandemic and through 2023, Chinese productivity grew by 5.2 percent annually.[26] As the country develops further, maintaining such very high rates of productivity growth will not be an easy feat.

All in all, relying on either of these levers, labor intensity and productivity growth, to offset the impact of the demographic shift on its own is unlikely to do the job. Fortunately, countries can use them in combination (Exhibit 20). The possible combinations of hours and productivity growth needed to maintain GDP per capita growth vary by country. For example, Germany could achieve past growth by increasing productivity at 0.9 percent per year while also increasing hours of work per capita by 2.2 or, alternatively, by growing productivity at 1.4 percent and hours of work per capita by 0.5 hour.

Exhibit 20

Many combinations of productivity and labor intensity growth could sustain past GDP per capita growth.

Combinations of productivity and hours per capita growth to sustain GDP per capita growth[1]



Note: For each economy, we show two points of the isoquants and the line that represents all possible combinations between the two. For visibility, we decide to not extend beyond the two points that mark the extremes of each isoquant, but the line technically extends infinitely in both directions.
[1]While "maintaining past GDP per capita growth" is a reasonable target for highly developed economies, China and South Korea were not as developed in 1997. Therefore, their GDP per capita growth targets are reduced, based on the trajectories followed in the past by other countries when they were at similar stages of development. China's target is 4.9% per year, while South Korea's is 2.0%.
Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

It could also attain past growth with a middle point of productivity and hours between these two outcomes, for example productivity growth of 1.1 percent and an additional 1.6 weekly hours per capita (see sidebar "'Isoquants' help plot the many potential paths to sustaining growth"). What is clear is that most countries in the first wave will likely need to rely on both.

Sidebar: 'Isoquants' help plot the many potential paths to sustaining growth

An "isoquant" is an economic concept that describes different combinations of inputs—in this case, productivity growth and increased labor intensity—that result in a given level of output; here, GDP per capita growth.

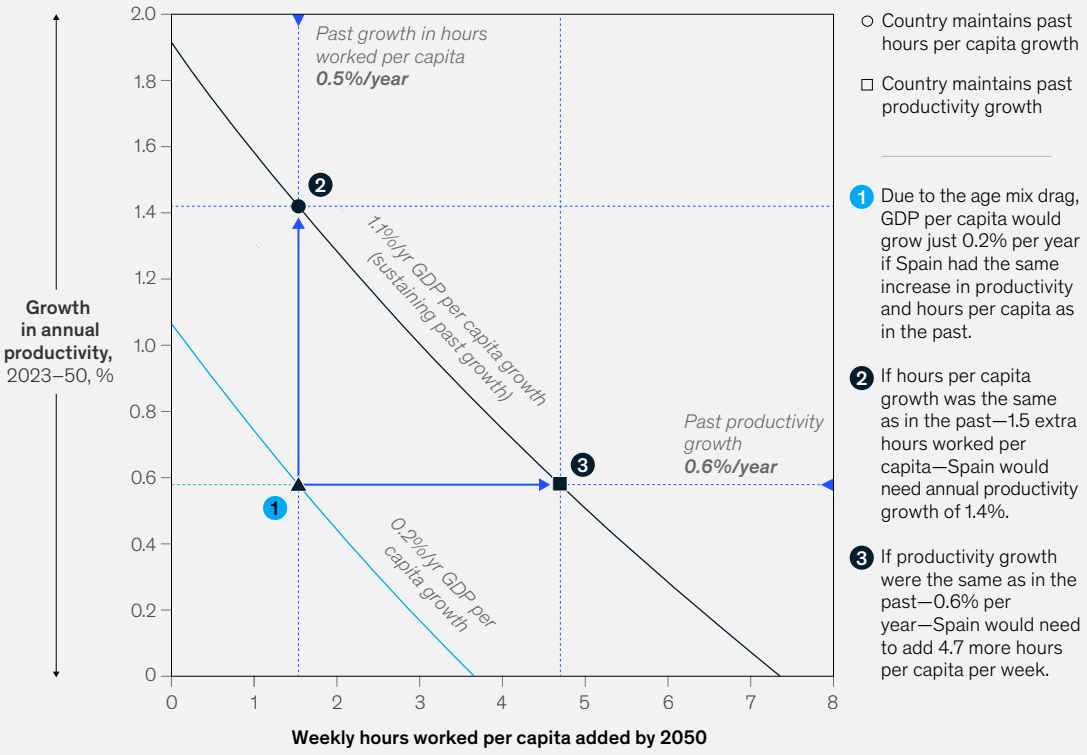
Take Spain as an example (exhibit). Given the impact of the demographic shift there through 2050, if labor intensity and productivity growth stayed the same, GDP per capita would grow 0.2 percent per year on average, significantly less than the country's average annual past GDP per capita growth of 1.1 percent.

If Spain maintained its past growth in hours worked, or 1.5 extra hours of work per person per week, productivity would need to grow by 1.4 percent a year. By contrast, if productivity growth remained stable at 0.6 percent a year, Spaniards would need to add 4.7 hours per week per capita to their current labor intensity levels. In fact, if Spain were unable to replicate the same labor intensity growth as in the past, which is not unlikely, the productivity growth needed to offset the demographic drag would exceed 1.4 percent and reach 1.9 percent.

Exhibit

Isoquants example: By increasing both hours worked per capita and productivity growth, Spain can sustain its past GDP per capita growth.

Isoquant productivity and hours worked per capita growth to sustain past GDP per capita growth



Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

The age mix can be changed, but with insufficient impact by 2050

The third lever to counteract the coming demographic drag is to influence the age mix itself, shifting the path already projected by the United Nations. This would require changes in fertility rates or migration patterns.

While increasing fertility rates is critical for population growth over the long term, babies born today will barely have entered the labor market by 2050, reducing the potential impact of higher fertility rates over much of the next quarter century.[27] Migration can more immediately help countries grow their working-age population. However, the increase in migration needed to maintain GDP per capita growth is significant.

For example, the United Kingdom's historical net migration is about 270,000 individuals per year, or 0.4 percent of its 2023 population annually, on average.[28] Holding past productivity growth constant, sustaining the country's past GDP per capita growth rate would require an average additional 140,000 migrant workers annually assuming that all migrants work, which would mean increasing the country's population by 0.6 percent per year through 2050. But not all migrants work, at least right away, which increases the number of people of working age but does not necessarily boost GDP. Assuming that the share of new migrants to the United Kingdom participating in the workforce is the same as in the past, or 80 percent, then the annual flow of migrants needed to maintain GDP per capita growth in the United Kingdom at past levels would need to be an additional 185,000 above historical levels, or a total of 0.7 percent of the current population annually.[29] Migrants also come with relatives who may not work—for example, children—so the real number needed would be even larger.

Other metrics illustrate the scale of migration required to maintain the economic status quo. For instance, new research estimates that if advanced economies relied on migration alone to maintain support ratios at today's levels, in many cases as much as half of their populations would be foreign born by 2050, assuming each migrant brings one dependent.[30]

2.3

2.3. A growing societal bill for dependency

Older people consume more than younger people, directly through purchases and indirectly via in-kind transfers such as government-financed healthcare services, even as their income from working decreases and eventually disappears at retirement. This creates an imbalance between total consumption and labor income earned by seniors within a given year; we call this difference the senior gap.[31]

This gap requires funding via public or private means. In first wave regions, the largest source of funding comes from governments taxing workers over their careers and making transfers in the form of pensions and in-kind services like healthcare to seniors. Additionally, some older households finance part of their consumption by spending savings that they accumulated while working.

As numbers of older people grow, all else being equal, aggregate senior gaps will widen. To date, increasing public transfers, mostly pensions, and rising asset prices have funded growing consumption among seniors. Whether and for how long these sources are sustainable as life expectancy extends remains an open question. Pension systems in first wave economies, especially those with defined-benefit programs, are already stretched. If returns on assets decline or public finances can't stretch any further, the only way to avoid savings depletion or falling consumption among seniors is some combination of the levers previously described—increased labor intensity and higher productivity growth over the short haul and effective migration and accelerated fertility rates in the longer term.

Older people consume marginally more than younger people

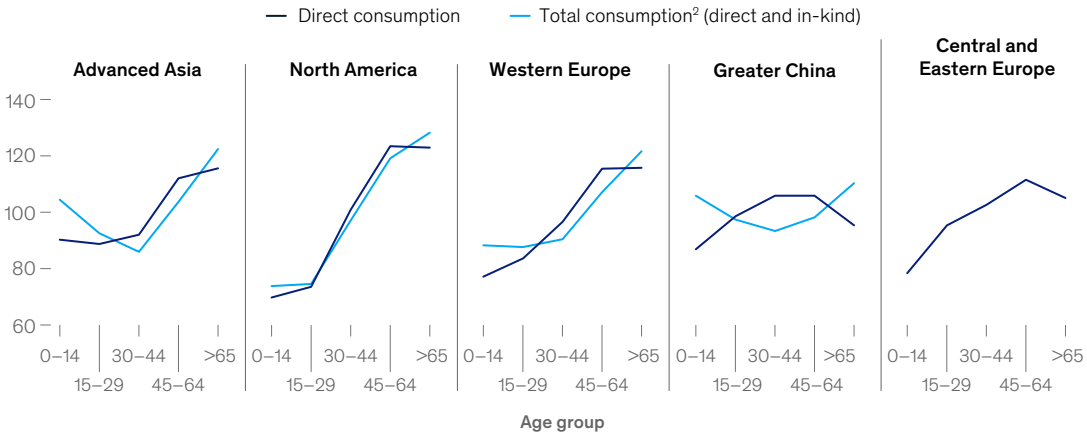
Our analysis of consumption encompasses out-of-pocket spending by households and individuals, which we refer to as direct consumption, and, when data is available, in-kind services paid from the public purse. Such transfers are often an important share of consumption, especially in first wave economies with generous public education and healthcare programs. For example, the average German receives $8,000 in public in-kind transfers a year, in addition to $30,000 they spend on direct consumption.[32]

In most first wave regions, older individuals consume marginally more even as they earn less.[33] In places where this isn't true, consumption doesn't fall substantially as people age. Both direct and in-kind consumption grow with age. In 2023, those 65 years and older had the highest consumption per capita in most first wave regions (Exhibit 21). Compared with overall average direct consumption by all age groups, this cohort spent 16 percent more per capita annually in both Western Europe and Advanced Asia. When measuring direct and in-kind consumption together, the discrepancy is even larger: seniors "spent" 24 percent more per capita a year in Western Europe and 22 percent more in Advanced Asia.

Exhibit 21

Older people consume marginally more than younger cohorts.

Average consumption per person in 2023,[1] indexed to 100 = average consumption per capita in 2023



[1]Average per region calculated as unweighted average of index-based consumption per country, with base 100 = average consumption per people in 2023 for each country.
[2]Data on in-kind consumption, necessary to calculate total consumption, is not available for all countries. In Advanced Asia, total consumption is available only for Australia, Japan, and South Korea; in North America, only for the United States; in Western Europe, only for Austria, Finland, France, Germany, Italy, Spain, and the United Kingdom; and in Greater China, only for Mainland China. No data on in-kind consumption is available for countries in Central and Eastern Europe.
Source: *World Population Prospects 2024,* United Nations; OECD; World Data Lab; McKinsey Global Institute analysis

McKinsey & Company

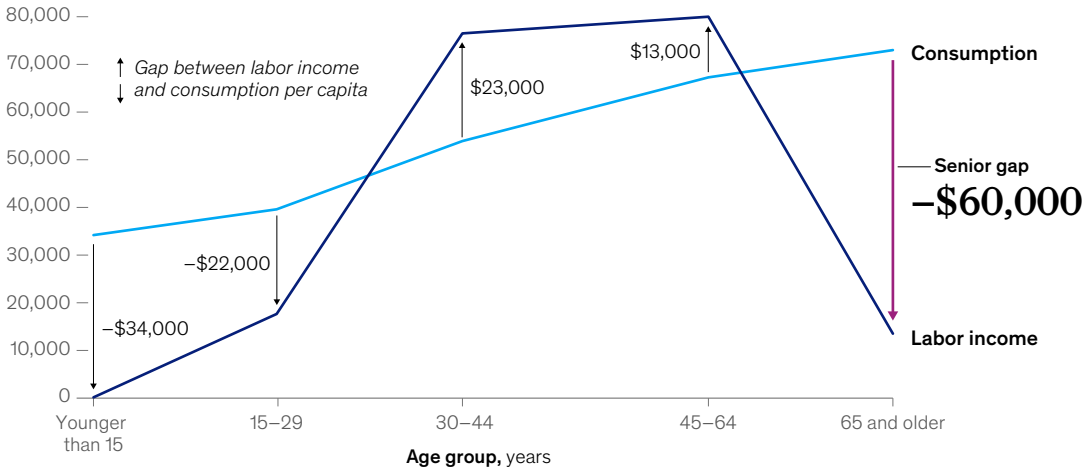
The aggregate senior gap will grow

Labor income and consumption change across a life cycle. Children are dependent on their families. When they reach adulthood, they join the workforce and generate income that may exceed their consumption needs, allowing them to save and accumulate wealth. At retirement, labor income decreases but consumption does not, creating a deficit—the senior gap.[34] In the United States, when direct and in-kind consumption were combined, the gap equaled $60,000 on average per person 65 years and older in 2023 (Exhibit 22).

Exhibit 22

The senior gap measures the difference between labor income and consumption among individuals 65 years and older.

Example: US labor income and consumption per capita by age group, 2023, $, 2021 PPP



Note: Consumption includes direct, out-of-pocket spending as well as the value of in-kind public goods and services.
Source: National Transfer Accounts Project; World Data Lab; McKinsey Global Institute analysis

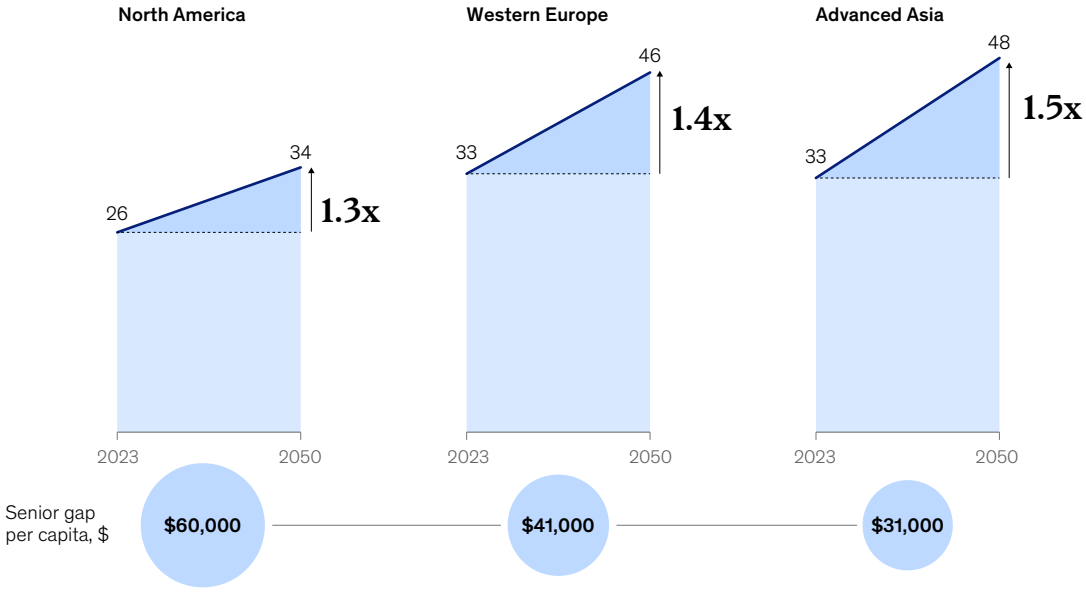
McKinsey & Company

As the share of older people rises, all else being equal, aggregate gaps will widen considerably by 2050.[35] To compare the burden over time, we divide the aggregate gap by the total labor income of each region. Take North America, where it was 26 percent in 2023 (Exhibit 23). This means that the total consumption of seniors not funded by their own labor income was equivalent to 26 percent of *all* labor income in the country. Seen another way, this is the equivalent of a flat tax that, if imposed on all worker incomes, would be required to cover the total senior gap. As the shift in age mix intensifies, North America's gap will rise to 34 percent by 2050 and go from 33 percent to 46 percent in Western Europe and from 33 percent to 48 percent in Advanced Asia.

Exhibit 23

The aggregate senior gap will increase between 1.3 and 1.5 times across regions.

Senior gap as a percentage of total labor income in 2023 and 2050[1]



Note: Data needed to calculate the senior gap is not available for all countries. In Advanced Asia, the gap can only be calculated for Australia, Japan, New Zealand, and South Korea; in North America, only for the United States; and in Western Europe, only for Austria, Finland, France, Germany, Spain, and the United Kingdom. The senior gap cannot be calculated for Greater China or any country in Central and Eastern Europe.
[1]Increases in the senior gap after 2023 account for the age mix effect by holding labor income and consumption per capita at 2023 levels and applying projected demographic changes from 2023 to 2050.
Source: National Transfer Accounts Project; World Data Lab; McKinsey Global Institute analysis

McKinsey & Company

The size of the gap may vary between countries based on consumer preferences. For example, consumers in one economy may choose to save more during their working lives and consume more in retirement, while those in another may choose to save less and consume less in retirement. Regardless of the gap's absolute size, it will rise across all first wave economies.

Individual seniors fund retirement in many ways: by saving directly during working years, by earning returns on assets, through public pensions, transfers and subsidized in-kind services, and through familial care and private transfers. In recent years in advanced economies, two of these sources—public pensions, mostly in the form of pay-as-you-go programs, and asset price appreciation, particularly in family homes, which has buoyed accumulated savings—have been central to funding seniors' consumption, but they may be increasingly hard to maintain for future generations of retirees.

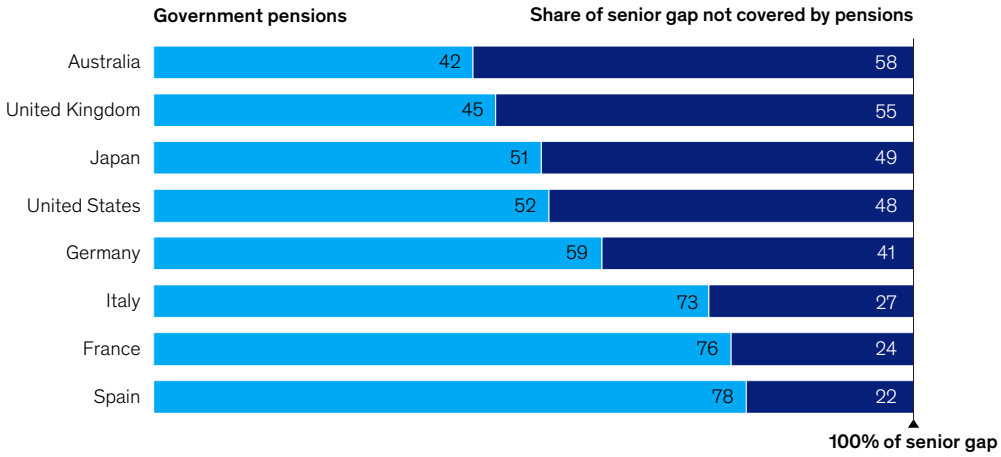
Public pensions will put increasing pressure on government finances

Public transfers, primarily in the form of public pensions, cover more than half of the senior gap in many first wave countries. In the United States, Social Security covered about half of the senior gap in 2023, while in Spain and France, public pensions funded close to 80 percent of it (Exhibit 24).[36] Other government programs, including in-kind government transfers, fund between 15 and 30 percent of senior gaps, depending on the country. Private sources such as returns on assets filled in the remainder.

Exhibit 24

Government pensions in 2023 covered between 40 and 80 percent of the senior gap in the countries we analyzed.

2023 share of senior gap covered by government pensions, %



Note: Pensions in this analysis do not include any private pension plans managed by employers, such as US private pension plans.
Source: OECD; European Union 2024 Ageing Report; McKinsey Global Institute analysis

McKinsey & Company

As support ratios—the number of working-age individuals for every person 65 years and older—fall fast, first wave countries will grapple with the question of whether public pensions and other age-related public transfers are sustainable. In most advanced economies, public pensions have pay-as-you-go systems that are funded by taxes on current workers. In addition, seniors often receive a range of in-kind benefits, which vary by country and individual but usually include healthcare and sometimes extend to housing, utilities, nutrition, or transportation.

Since 1970, time spent in retirement has increased substantially, from eleven to 18 years, according to research by the OECD.[37] As lives lengthen, getting the pension math to "add up" is increasingly challenging. Countries across the developed world have opened conversations on changes ranging from increasing the statutory retirement age to switching to defined-contribution systems, in which retirement benefits are calculated based on the money paid into the program (see sidebar "Pension tensions: Sense on the dollar?"). Absent changes, increasing numbers of seniors will cause government deficits and debts to continue rising.

Sidebar: Pension tensions: Sense on the dollar?

More than 2,000 years ago, the fall of the Roman republic was inextricably linked to the payment, or rather the nonpayment, of military pensions. During the American Revolution, army pensions became such a sensitive issue that only the intervention of George Washington himself prevented a mutiny of Continental Army troops over delays in the payment of their promised pensions.[1]

Today, almost all advanced economies have some form of pension system, although the comprehensiveness of these systems varies widely and their future is uncertain.

Modern pension systems take the following three main forms, and most developed countries have more than one form, or a multi-pillar pension system:

- *Pay-as-you-go systems:* Most common in Western Europe, these systems pay retirees from contributions made by today's workers.
- *Defined-contribution systems:* Workers contribute to a retirement fund during their employment and receive payouts from it in retirement. Both the United Kingdom and China are shifting funding to defined-contribution systems from publicly funded pension systems.
- *Personal savings:* Workers save and invest their own money for retirement spending. Sometimes this may be facilitated or encouraged by the government, for example through tax-advantaged retirement savings vehicles.

The US system features a blend of the three types. Social Security is a pay-as-you-go system; employer-sponsored 401(k) plans are a flavor of defined-contribution pension; and individual retirement accounts (IRAs) are a commonly used personal retirement savings tool. Seventy-three percent of civilian workers in the United States had access to some form of employee retirement benefits in 2023.[2]

Public pension systems around the world are under big strains due to slow economic growth, inadequate contribution rates, and increasing longevity, as seniors spend more time in retirement. For example, in the OECD, men are spending 18 years in retirement and women 23 years, compared with 11 and 15 years, respectively, in the early 1970s.

The global gap between retirement savings and the amount of savings needed to replace 70 percent of preretirement income for retirees was projected in a 2019 World Economic Forum report to exceed $400 trillion by 2050, more than five times the size of the global economy.[3] The report projected that 25 percent of that gap could stem from unfunded government pension obligations. In the United States, the fund that supports Social Security benefits could be depleted by 2034, at which point benefits could be reduced by about 25 percent unless action is taken to shore up the system.[4]

For many years, the retirement paradigm was that one worked into their mid-60s and then lived off pensions and other savings for just a few years before dying. Traditionally, lower life expectancies meant the average person could only expect to live a few years in retirement. As countries grapple with looming issues, that paradigm may need to shift, and countries are experimenting with different ways.

Many first wave countries have adjusted funding strategies or moved from a defined-benefit to a defined-contribution system. For example, the Netherlands passed a systemic reform of private pensions that included that switch.

Other countries are raising the retirement age. Current retirement ages are set to increase in three-fifths of OECD countries. In China, a 1950s-era system that allowed men to retire at 60 years and women between 50 and 55 years was recently overhauled, increasing the retirement age for men to 63 years and for women to 58 years.[5] Sweden raised the retirement age and will link it to two-thirds of life expectancy gains. France has tightened early and minimum retirement ages. The age requirements for pension eligibility range from 62 years in Colombia, Luxembourg, and Slovenia to 70 years or more in Denmark, Italy, and the Netherlands.[6]

Still others are focusing on mandating and facilitating private savings. Australia's retirement system relies on mandatory private savings via superannuation, requiring employers to contribute 9 percent of wages. Some independent entities project that workers will retire with two to three times the pension income they would have had under the public pension system in the future.[7] And in the United States, the Internal Revenue Service recently increased the percentage of pretax income workers can contribute to IRAs each year.[8]

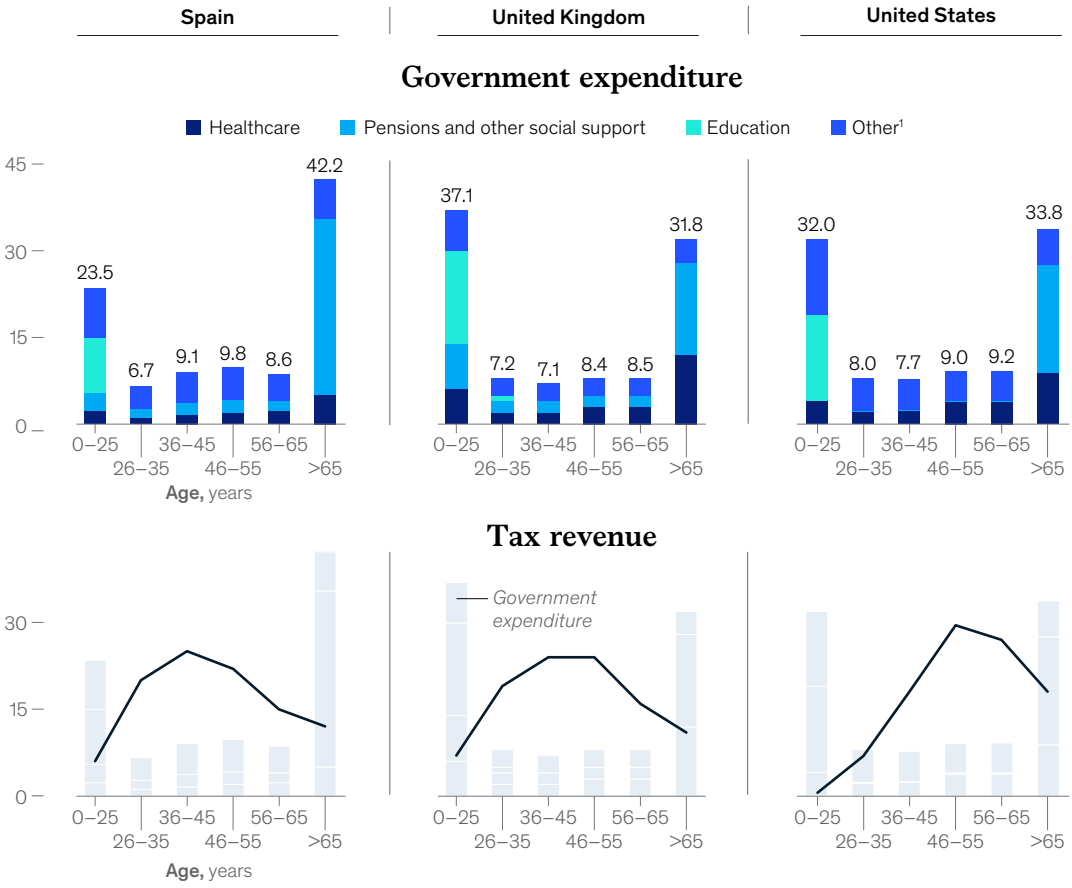
1 Robert L. Clark, Lee A. Craig, and Jack W. Wilson, "The evolution of public pensions," in *A history of public sector pensions in the United States*, University of Pennsylvania Press, 2003.
2 "73 percent of civilian workers had access to retirement benefits in 2023," *Economics Daily*, US Bureau of Labor Statistics, accessed November 26, 2024.
3 Han Yik, *Solving the global pension crisis*, World Economic Forum, December 16, 2019, updated September 10, 2024.
4 *The 2023 annual report of the board of trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance trust funds* (Trustees Report), Social Security Administration, March 2023.
5 Farah Master, "China approves plan to raise retirement age from January 2025," Reuters, September 13, 2024.
6 *Pensions at a glance*, OECD, December 2023.
7 Daniel Mitchell and Robert O'Quinn, *Australia's privatized retirement system: Lessons for the United States*, The Heritage Foundation, December 1997.
8 "401(k) limit increases to $23,000 for 2024, IRA limit rises to $7,000," Internal Revenue Service, November 1, 2023.

To illustrate this, we focus on three first wave economies: Spain, the United Kingdom, and the United States; they publish reliable public statistics on government income and expenses by age and have widely accessible public pay-as-you-go pension systems.[38] Governments in these economies collect most tax revenues from their working-age citizens and spend most of that revenue on the youngest and oldest. For example, in Spain in 2023, seniors contributed 12 percent of total tax revenues but consumed more than 40 percent of government spending, mostly in the form of pension payments and healthcare. On the flip side, Spaniards 36 to 45 years delivered 25 percent of all tax revenue and accounted for just 9 percent of government spending (Exhibit 25). This intergenerational social contract works so long as a balance between younger and older people is maintained. However, when that balance tips and there are too few workers to sustain the obligations that societies have to retirees, that social contract is strained.

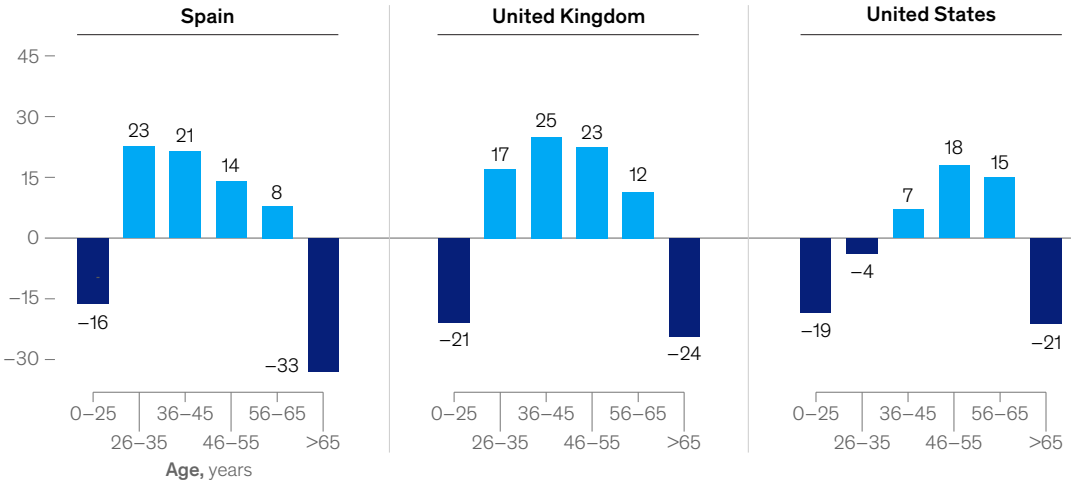
Exhibit 25

Government transfers peak in young and old age, while tax payments peak in middle age.

Government expenditure by category and by age, and tax revenue by age, 2023, % of total



Government primary surplus/deficit per capita by age in 2023, $ thousand 2021 PPP



Note: Analysis of the United Kingdom used national statistics, while analysis for Spain and the United States used age-group allocation proxies.
[1]Other refers to all other categories of government expenditure, including those that do not finance individual consumption. Examples include defense and security, recreation and culture, environmental protection, and general public services.
Source: *World Population Prospects 2024,* United Nations; UK Office for Budget Responsibility; Tax Foundation; OECD; CaixaBank Research; McKinsey Global Institute analysis

McKinsey & Company

Seniors are the largest group of net recipients of government expenditures. The difference between taxes paid and transfers received by the average senior ranges from $21,000 in the United States to $33,000 in Spain. This amounts to a total difference of more than $1.2 trillion in the United States and $325 billion in Spain annually.

Due to the age mix effect, deficits will increase as tax revenues fall and age-related expenditures increase, all else being equal (Exhibit 26). Keeping per capita tax revenue and public expenditures constant and applying the impact of the demographic shift, the overall per capita deficit would increase by 4.5 times in Spain in the next quarter century, from $1,700 to $7,900.[39] In the United Kingdom, where the population 65 years and older will continue to grow but at a slower pace, the average gap could double, reaching $1,800.

In the United States, the average gap will increase by 12 percent, all else being equal, since taxes will increase slightly as those 46 to 64 years old pay more tax on average than younger people. The US Congressional Budget Office's annual deficit projections, which dynamically consider many more relevant variables, estimate that total deficits will grow from 6.2 percent of GDP in 2023 to 8.1 percent in 2050, with about a fifth of the increase explained by a changing age mix. This equates to a 16 percent increase per capita based on age mix alone, slightly higher than our 12 percent projection.[40]

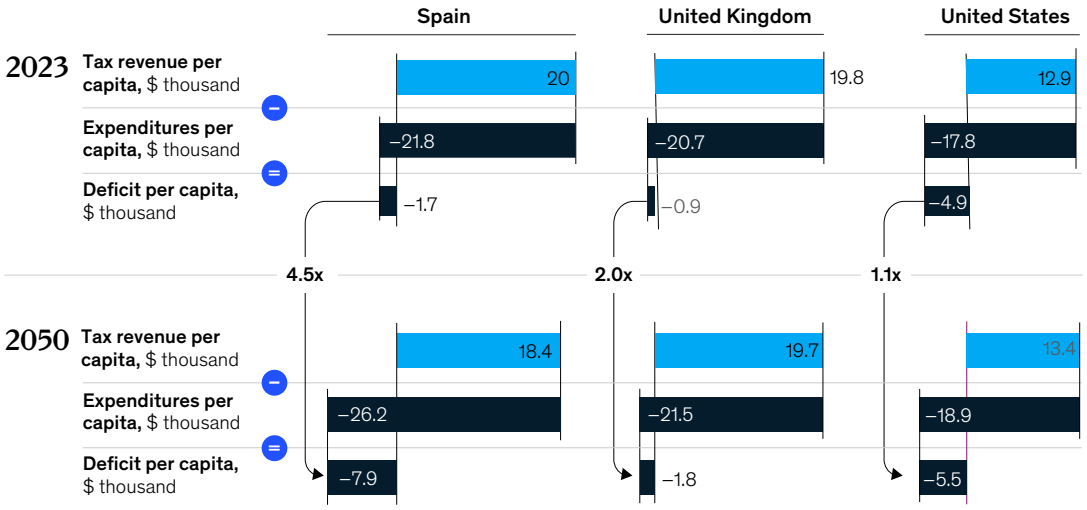
These growing gaps come at a time when government finances are already strained. In numerous first wave countries, including France, Italy, Japan, Spain, the United Kingdom, and the United States, public debts exceed 100 percent of annual GDP.[41]

Age-related public expenditures have accounted for much of the growth in public expenditures that exceed tax revenues. For example, healthcare expenditure in the United Kingdom increased 3.2 percent on average annually from 1997 to 2021, while the country's total expenditures grew an average of just 1.2 percent. Similarly, in the United States, spending on Social Security increased

Exhibit 26

All else being equal, government deficits will increase as tax revenues fall and age-related expenditures increase.

Evolution of tax revenue, expenditure, and national deficit per person,[1] 2023–50



[1]2050 values represent changes if age mix were to shift but all other variables, including rates of tax and expenditure within each age group, were to remain constant. These are not projections.
Source: UK Office for Budget Responsibility; Tax Foundation; OECD; National Transfer Accounts Project; CaixaBank Research; McKinsey Global Institute analysis

McKinsey & Company

annually by 2.4 percent on average across the same period, more than twice as fast as the average 0.9 percent growth in total government expenditure.[42] Over that period, tax revenue in the United Kingdom and the United States increased less than 1 percent on average per year.[43]

Asset appreciation, especially in real estate, has supported senior consumption—so far

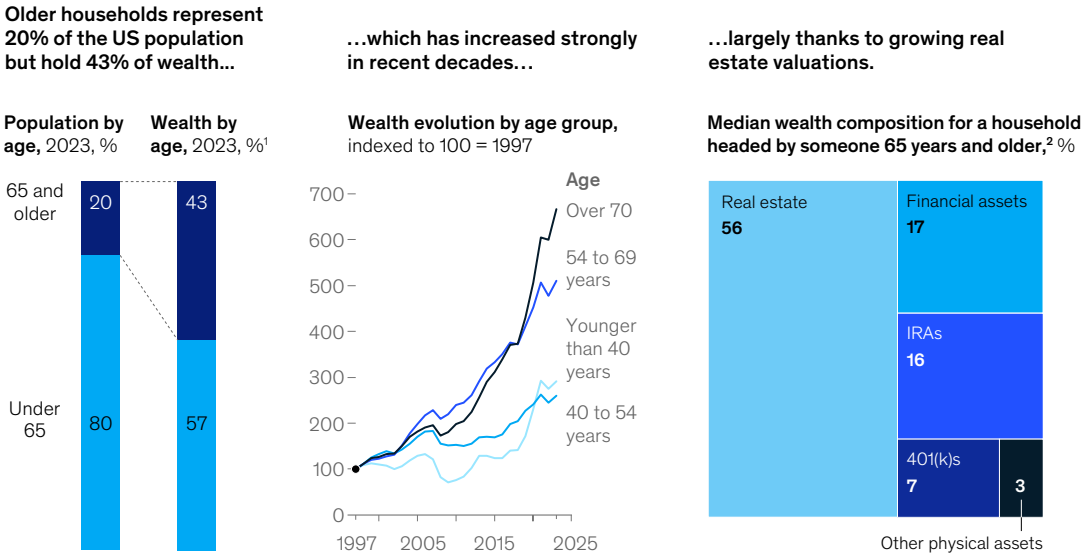
Personal savings fund the balance of consumption in retirement not covered by government transfers. How these savings are accumulated depends on individual savings behavior and asset returns. Retirees in many advanced economies have accumulated wealth in recent decades, in large part thanks to rising asset prices, particularly for housing but also via equity markets.[44] To understand the link between wealth and senior gaps, we focus on the United States, which has high-quality and granular data.

Overall, wealth is unevenly distributed—across the US population, the top 1 percent of households hold 26 percent of the country's wealth, while the bottom 50 percent hold 3 percent of it.[45] As more people enter retirement, those without wealth will need to rely primarily on public pensions that are already strained.

In aggregate, though, older people are generally wealthier than younger people, which provides a kind of buffer for retirement. American households where the primary householder is 65 years and older held 43 percent of the country's total wealth, although they made up only 20 percent of the US population in 2023 (Exhibit 27).[46] The wealth held by older households grew by a factor of 6.6 from 1997 to 2023.[47] By contrast, among households with a primary householder 40 years and younger, wealth increased by a factor of 2.9 over the same period.[48]

Exhibit 27

US seniors have accumulated significant wealth, mostly due to rising real estate values, complicating wealth accumulation for future generations.



[1]Population and wealth counted at the US household level on the basis of the age of the head of a household.
[2]Median value of assets for a US household owning each asset class, adjusted for the ownership rate.
Source: US Census; US Federal Reserve Board; S&P Global; Federal Reserve Bank of St. Louis; McKinsey Global Institute analysis

McKinsey & Company

One big contributor to wealth in the United States has been real estate. Almost 80 percent of Americans 65 years and older are homeowners, and 60 percent of them are mortgage-free.[49] Older homeowners in the United States typically don't pay rent, which frees up resources to consume other goods and services. As we show in the following section, individual consumption of housing and utilities, including imputed rents, among those 65 years and older accounts for about 40 percent of total consumption, a sizable portion.[50] Homeowners also have the option of moving to smaller, cheaper homes to free up equity. Research indicates that housing mobility among individuals 55 years and older can be as high as 39 percent.[51] Homes can be used as loan collateral, and more expensive homes allow for larger loans with better terms. Value from homeownership is sometimes hard to unlock—for example, selling a home is not always easy and has costs associated with it—but these options are nonetheless available to homeowners, who are disproportionately older.

Other sources of private wealth have also had outsize returns in recent years. For example, returns from US stock markets averaged 10.8 percent annually after adjusting for inflation from 2013 to 2023, significantly higher than the 50-year average of 6.4 percent from 1973 to 2023.[52] A significant portion of 401(k) retirement assets benefit from these stock market returns for the 56 percent of US workers who have them.[53]

One question is whether future seniors will be able to fund consumption with earnings linked to accumulated wealth to the same extent that current seniors can. For instance, young savers may face challenges in buying a house, an asset that has increased markedly in price over the past two decades. The average US single-family home was 6.6 times more expensive in 2023 than in 1980.[54] Back then, the median home price was 4.4 times the median annual household income.[55] In 2023, that ratio was 7.1 times and as high as 12.5 times in Los Angeles, California.[56] Younger families buying homes may be left with a double burden of a higher mortgage and higher taxes to fund retirees. Younger people who eventually inherit homes may do so at older ages as their parents live longer. Additionally, there is no guarantee that home prices will keep rising in the face of declining populations. For example, Japan has experienced low real price appreciation in recent years, in part due to low population growth, especially in rural areas where housing prices fell faster as populations declined.[57]

Future generations may face obstacles to accumulating the same levels of private wealth as today's seniors, and more of them will be retiring and living longer in their retirement. First wave countries will need to ensure the sustainability of public pension systems. Tweaking retirement ages will not be sufficient. In many countries, it will take raising labor intensity across different age groups and simultaneously increasing productivity, alongside migration and long-term increases in fertility. None of these are easy fixes, but in combination, they can offset the demographic drag, protect public finances, and boost human well-being and prosperity.

2.4

2.4. Older workers, older consumers

As demographic shifts change the composition of labor forces and consumption pools, businesses will find new opportunities and challenges. By 2050, the share of the population 65 years and older in first wave countries will rise to 29 percent, up from 17 percent today and 10 percent in 1997. Companies can revisit strategies and adapt mindsets to remain relevant. Those that understand how shifting demographics will affect their customers and employees and adapt accordingly will gain a competitive advantage in the rest of this century.

Welcome the senior workforce

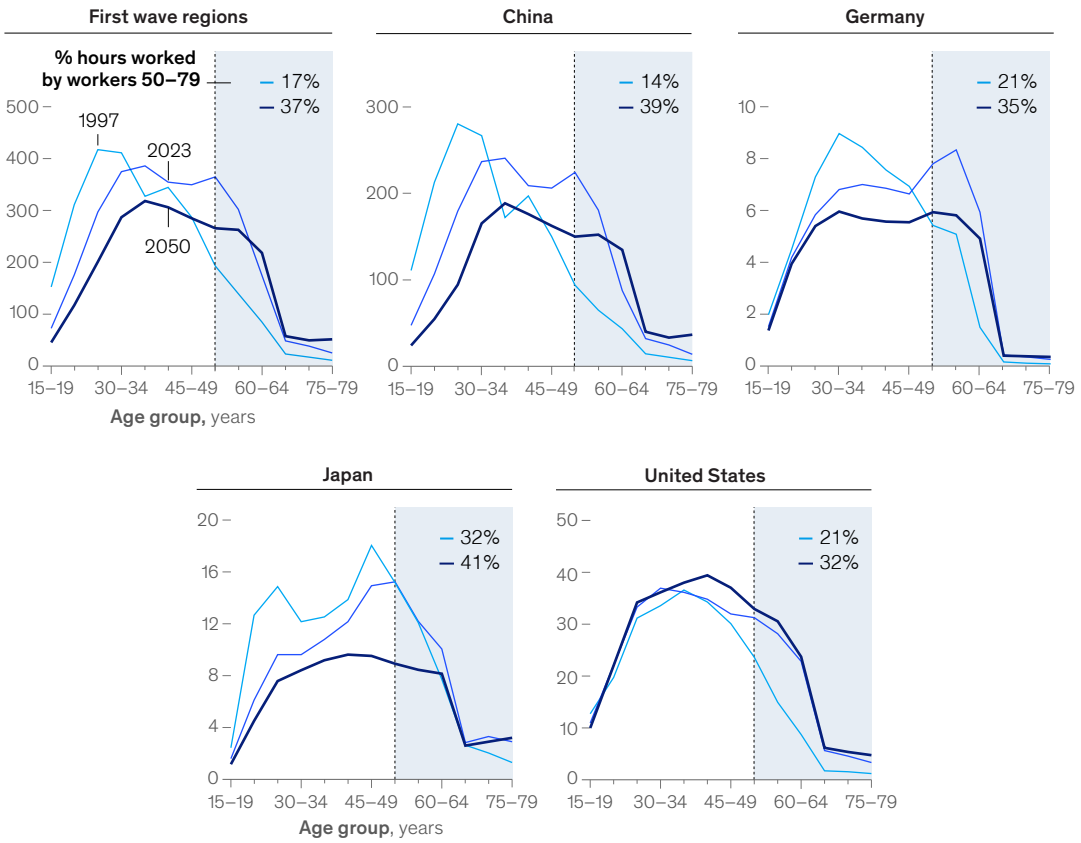
One big consequence of the demographic shift in first wave regions is a likely increase in the share of older workers in the labor supply. An older workforce presents unique needs and challenges that organizations must address as well as skills and experiences they will want to harness to ensure continued productivity. With more older people in their workforces, businesses will need to adapt career planning, reorganize teams, encourage lifelong learning, and expand and adjust retraining programs. We examine what businesses and policy makers can do more fully in chapter 4.

By 2050, if hours of work per capita for each age cohort are held constant and only the age mix shifts, people 65 years and older will contribute 6 percent of the total hours worked in first wave economies, up from 4 percent today. Among people 50 years and older, the trend is more stark: their share will climb to 37 percent on average by 2050, up from 32 percent today and 17 percent in 1997 (Exhibit 28).[58] In China, for example, workers aged 50 and older will account for 39 hours of every 100 hours worked, up from 31 hours in 2023.[59] For many economies in Advanced Asia and Europe, this trend began during the past 25 years, and their share of older workers will level off. For example, in Japan, people aged 50 and older account for 42 percent of hours worked today, up from 32 percent in 1997, and that level is expected to stay relatively flat through 2050. However, if labor intensity among older people keeps growing, as it has in the past quarter century, their share of the workforce will increase even more. For example, if older Germans kept increasing their working hours as they did over the past quarter century, they would account for as much as 42 percent of the country's labor force rather than 35 percent by 2050.

Exhibit 28

The age profile of worked hours will flatten in the future compared with the youth-centric structures of the past.

Total hours worked per age group,[1] million



[1]Taking into account both the population and average hours worked within each age group.
Source: *World Population Prospects 2024*, United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

The share of consumption from seniors will grow

As discussed in the previous section, consumption grows with age. Healthcare expenditures account for much of the higher spending by seniors, but even excluding it, per capita consumption goes up—or does not decline meaningfully—as people age. However, the effects of age shifts on overall consumption appear slowly.[60]

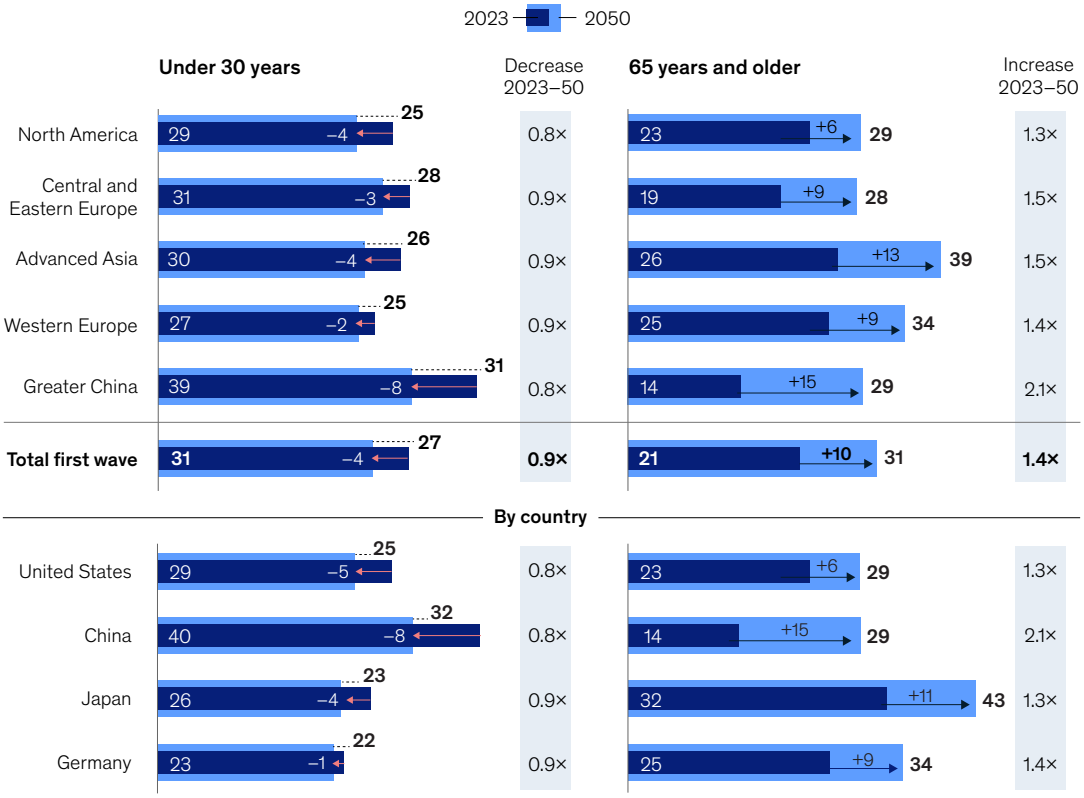
What may change more quickly is the share of consumption that seniors account for. Today, residents of first wave economies who are 65 years and older account for 21 percent of direct consumption, which is the share of consumption paid for by households, compared with 15 percent a quarter century ago. As countries become increasingly youth scarce, this share will increase to 31 percent by 2050, assuming consumption per capita in each age group remains constant and only demographic patterns change (Exhibit 29).

Some regions may see much more dramatic shifts. In China, for instance, those 65 years and older accounted for 14 percent of direct consumption in 2023, a share that could more than double by 2050. In Advanced Asia, the share of direct consumption by older people could rise from 26 percent today to 39 percent over that period. In dollars and cents, that means $4 of every $10 of direct spending there may come out of the wallet or bank account of a senior.

Exhibit 29

If 2023 spending patterns are maintained, the share of consumption by those 65 years and older in first wave regions will rise from 21 to 31 percent.

Share of direct consumption, 2023 and 2050, %



Source: *World Population Prospects 2024*, United Nations; World Data Lab; McKinsey Global Institute analysis

McKinsey & Company

Due to falling fertility rates, the share of consumption among those younger than 30 years will decrease from 31 percent in 2023 to 27 percent in first wave regions, including a fall of as much as eight percentage points in China. In most first wave countries, however, this declining share of young consumers is likely to be offset by rising incomes and thus not result in absolute decreases in consumption dollars through 2050. Consumers aged 45 to 65 years are likely to maintain a relatively flat share of total consumption through 2050.[61]

What is consumed will change: More health and wellness, less education spending

Global consumption is set to shift toward categories of goods and services consumed in greater quantities by those 65 years and older. At a category level, some of the biggest shifts will be in healthcare among older people and education among younger people. These categories are driven by in-kind consumption funded directly by governments. For example, an average individual in Germany spends just $1,000 annually on out-of-pocket healthcare consumption, an amount that increases to more than $8,000 when combined with in-kind transfers to capture all forms of health spending.[62]

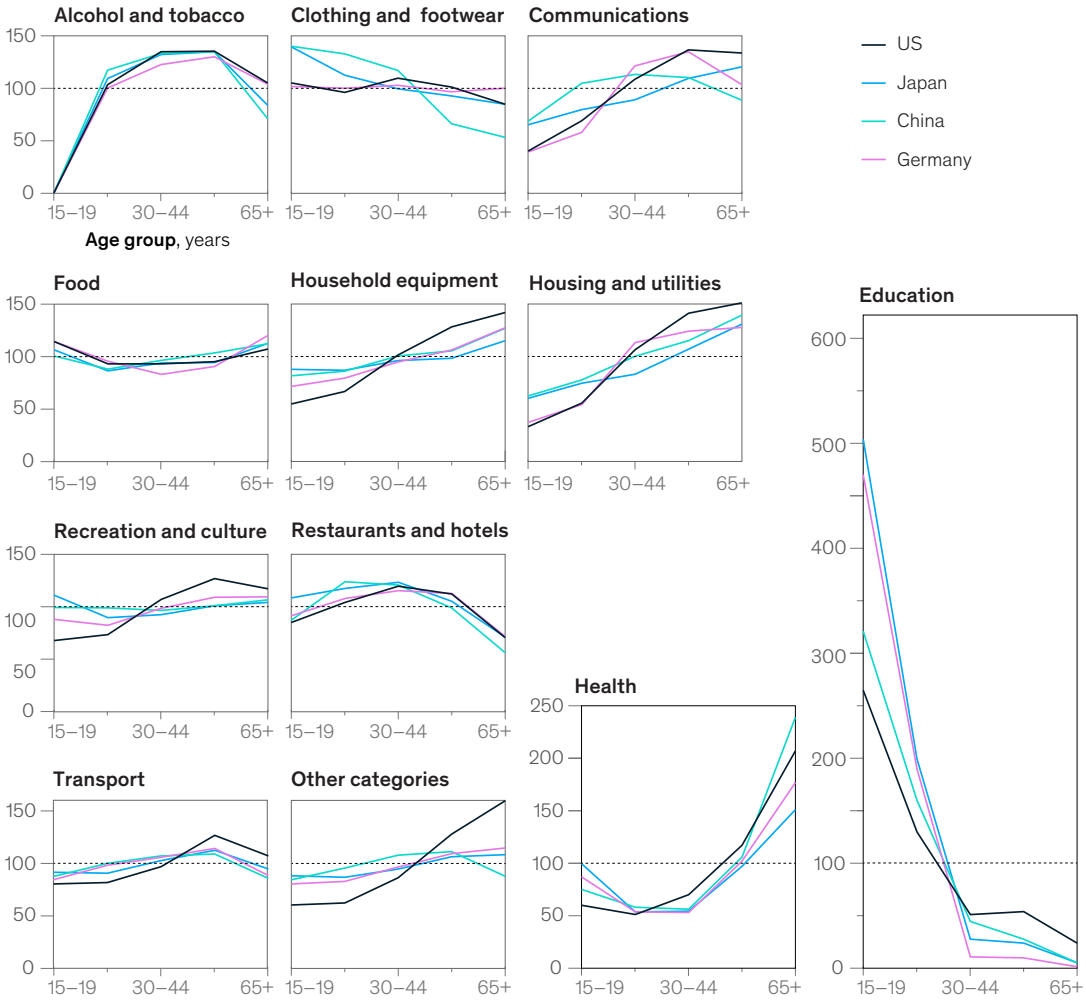
To analyze overall consumption among categories across a life cycle, we focus on China, Germany, Japan, and the United States, where granular data exists for in-kind government expenditure, which we add to household expenditure. Not surprisingly, education consumption decreases sharply with age, going from a range of 20 to 40 percent of consumption for children up to 15 years old to less than 1 percent for those 65 years and over. In absolute values, governments and individuals in the United

States, for instance, spend an average of $7,000 on education annually for each child younger than 15 years, whereas an individual over 65 years spends only $600 on average annually on education.[63] By contrast, seniors' expenditure on healthcare, both directly and in kind, is significantly bigger than that of children. In the United States, healthcare consumption varies from $3,400 a year on average for those younger than 15 years to $11,600 a year for those older than 65.[64] In China, it more than triples over a life cycle, from $800 to $2,600 (Exhibit 30).

Exhibit 30

All countries we analyzed have similar patterns of consumption by category over a lifecycle.

Per capita consumption by category in 2023, indexed to 100 = total per capita expenditure across age groups within country and category



Source: World Data Lab; McKinsey Global Institute analysis

McKinsey & Company

Of course, there is some variation. For instance, American seniors spend significantly more on housing and utilities than their younger counterparts, a trend that is less pronounced in China, Germany, and Japan. In the clothing and footwear category, Chinese seniors spend significantly less than younger cohorts, but not in Germany, Japan, and the United States. For most categories of consumption, however, trends across a life cycle are broadly consistent in the four countries highlighted here.

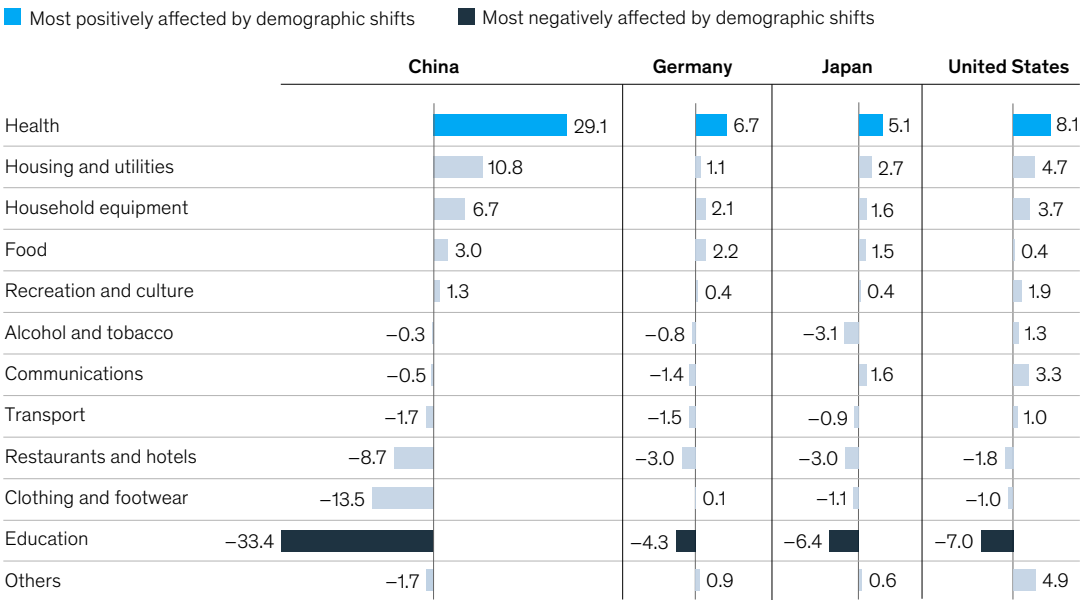
Given how consumption plays out over a life cycle, we can measure how shifting demographics could affect the size of different spending categories.[65] In three of the four countries analyzed, healthcare will be the consumption category most increased by demographic shifts, with spending on healthcare per capita increasing between 5 and 29 percent as a result of changes in age mix alone. In Japan, the average person will spend 5 percent more on healthcare per year in 2050 compared with 2023, considering only the age mix shift. In the United States, per capita healthcare consumption could increase by 8 percent, or $380 billion in 2050, solely as a result of the shift in age mix.

Conversely, education spending could shrink most due to the demographic shift in all four countries as falling fertility rates cause the number of young individuals to decline. Average yearly education consumption per capita could be 4 to 33 percent lower by 2050 due to age mix shifts, or as much as $465 billion less in China in aggregate by 2050 solely due to age mix (Exhibit 31).

Exhibit 31

Age mix shifts will drive increased healthcare expenditures and shrink spending on education on a per capita basis.

Additional per capita consumption expected in 2050 compared to 2023 based only on the age mix effect, %



Source: World Data Lab; OECD; McKinsey Global Institute analysis

McKinsey & Company

Other factors, including population growth or decline and changes in per capita income, will also influence future consumption in these categories. Japan's population is expected to shrink by 15 percent by 2050, while that of the United States is projected to grow by 11 percent, which will cause market sizes to diverge in aggregate. In addition, our analysis suggests that more than 80 percent of the increase in aggregate consumption has stemmed from rising per capita incomes over the past few decades and only very little from demographic effects.

Including expected income and population effects, World Data Lab projects that US healthcare expenditures could grow by as much as $1.2 trillion by 2050. Despite negative population growth, overall consumption across all categories is expected to grow by 15 percent in Japan and to more than double in China by 2050 solely on the basis of income effects. Even in a category like clothing and footwear that will be negatively affected by the age mix effect, total consumption is projected to increase by 4 percent per year in the United States and 73 percent in China based on rising incomes.

Businesses in first wave countries will need to learn and adapt to changing patterns among consumers and the workforce. These shifts are already under way in some places, which we explore in Chapter 4. Ultimately, if businesses can make these adjustments, they can not only improve their own competitive positioning but also contribute to counteracting the demographic drag and lift their workers' and consumers' living standards.

3. Anticipating demographic shifts in later wave regions

The same demographic shift reducing the share of working-age people in first wave regions today is gathering force and will engulf many later wave economies in one to two generations. These regions—Emerging Asia, India, Latin America and the Caribbean, the Middle East and North Africa, and Sub-Saharan Africa—have the benefit of some time to prepare for the consequences of changing population structures, though how much time each has before shifting demographics become a drag on GDP per capita varies widely. In Sub-Saharan Africa, for example, the working-age share of the population won't decline until sometime after 2080, while in Latin America, it will do so 50 years earlier, in the 2030s.

However, later wave regions overall face a challenge most first wave regions do not, namely the need to "get rich" before their populations "get old." Today, most countries in first wave regions have attained high incomes and have high-quality infrastructure, extensive provision of public services, and high productivity. Over the next quarter century, most later wave economies will have first wave population structures but significantly lower GDP per capita. Their challenge is to increase wealth *before* their populations age. While Sub-Saharan Africa has more time, its GDP per capita is significantly lower than any other region's, increasing the imperative to raise productivity faster than population growth.

Later wave regions can learn what to emulate—and what to avoid—from the experiences of first wave regions. These younger regions have the gift of time, though that, too, is limited.

Later wave regions face the challenge of 'getting rich' before they 'get old'

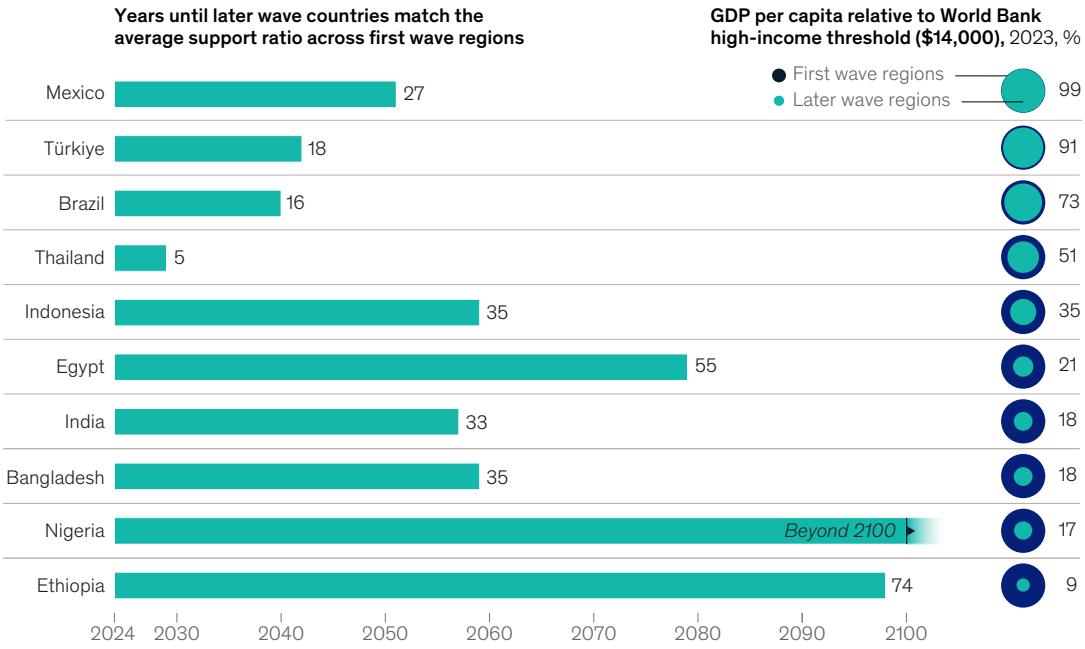
Many emerging economies have struggled to achieve per capita income and living standards that match those in rich countries, despite remarkable progress to reduce extreme poverty. According to the World Bank, more than 60 percent of the world's population lived in low-income countries in the 1990s, while today less than 10 percent do.[66] Yet the share of people living in high-income countries has stubbornly remained less than one-fifth of the global population over that period.[67]

Meanwhile, the demographic clock is ticking for emerging economies. Fertility rates in one-third of the 138 countries in later wave regions are already below replacement. For example, India's fertility rate is 1.98 and Türkiye's 1.63. Fertility rates in Latin America and the Caribbean stand at 1.8 on average, and each of the region's six biggest economies—Argentina, Brazil, Chile, Colombia, Mexico, and Peru—has a fertility rate below 2.0. By 2050, fertility rates will drop below the replacement rate in 32 more countries in later wave regions, according to UN projections. Only in Sub-Saharan Africa will the average fertility rate, 2.9, exceed the replacement rate of 2.1.

As fertility rates fall, so subsequently will support ratios—the number of working-age people for every person over 65. These regions therefore have limited time before their population structures take the shape of those in first wave regions today, reaching their support ratios (Exhibit 32). They will need to accelerate their economic growth to get ahead of their demographic shift and attain living standards that can support seniors.

Exhibit 32

Countries in later wave regions, with lower GDP per capita, are one to two generations behind the demographic changes in first wave regions.



Source: *World Population Prospects 2024*, United Nations; McKinsey Global Institute analysis

McKinsey & Company

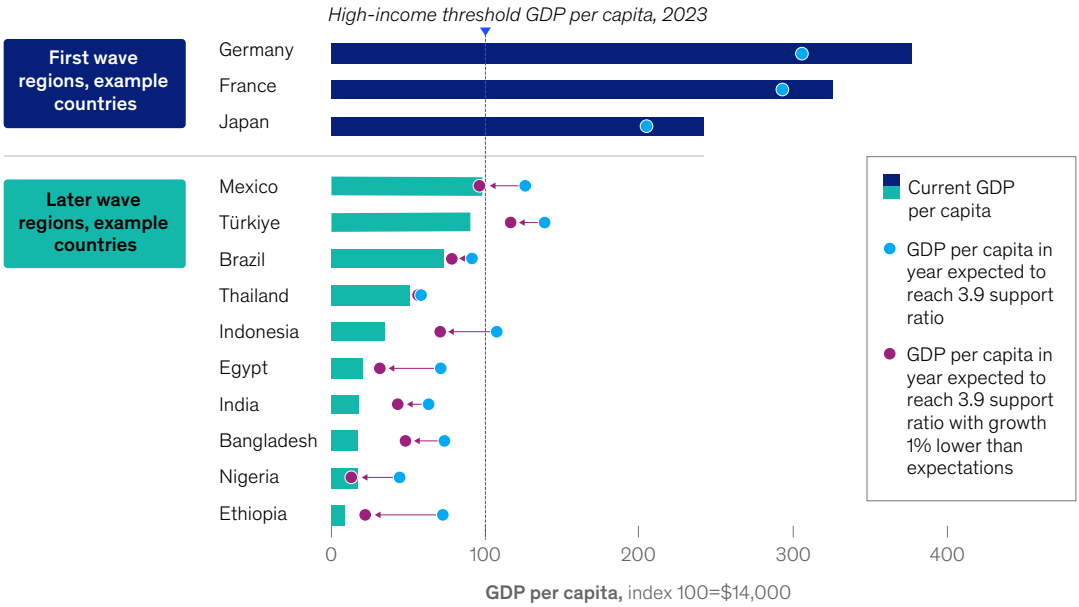
Achieving the high-income threshold of per capita GDP is a challenge for many developing countries. For example, Brazil's GDP per capita is 73 percent of the World Bank threshold for high-income countries, and the country is expected to reach the average support ratio of first wave economies, 3.9, in 16 years. Bangladesh has 35 years until it reaches that ratio, but its GDP per capita is just 18 percent of the high-income threshold at present.

Sub-Saharan Africa has more time but also starts with lower GDP per capita. For example, GDP per capita in Ethiopia is roughly $1,200, or 9 percent of the high- income threshold, while in Nigeria, GDP per capita is $2,400, or roughly 17 percent of the threshold. Estimates of potential economic growth are notoriously uncertain, and even small deviations in economic growth compound over time. But existing projections suggest that more than two-thirds of later wave countries would not reach the high-income threshold before their support ratios fall to the current level in first wave regions (Exhibit 33).[68] If all countries in later wave regions underperformed projections by just 1 percent a year, 80 percent of them would fail to achieve the high-income threshold before their populations were as aged as in first wave regions. If they fell short by 2 percent, 87 percent would not be high-income by that time.

Exhibit 33

Two-thirds of later wave countries are not expected to 'get rich' before they 'get old,' and even more will miss the target if growth slips by 1 percent.

GDP per capita today and in the year a country is expected to reach a support ratio of 3.9, indexed to 100 = high-income threshold GDP per capita, 2023[1]



[1]GDP per capita of $14,000, the high-income threshold defined by the World Bank.
Note: GDP estimates for 2024–50 are based on projections from World Data Lab using IMF forecasts. Projections for years 2050–2100 rely on the 2045–50 CAGR from those forecasts. The alternative scenario is based on subtracting 1 percentage point to forecast GDP per capita growth per year.
Source: *World Population Prospects 2024,* United Nations; World Bank; World Data Lab; Oxford Economics; McKinsey Global Institute analysis

McKinsey & Company

The demographic dividend will diminish in later wave regions, other than Sub-Saharan Africa, through 2050

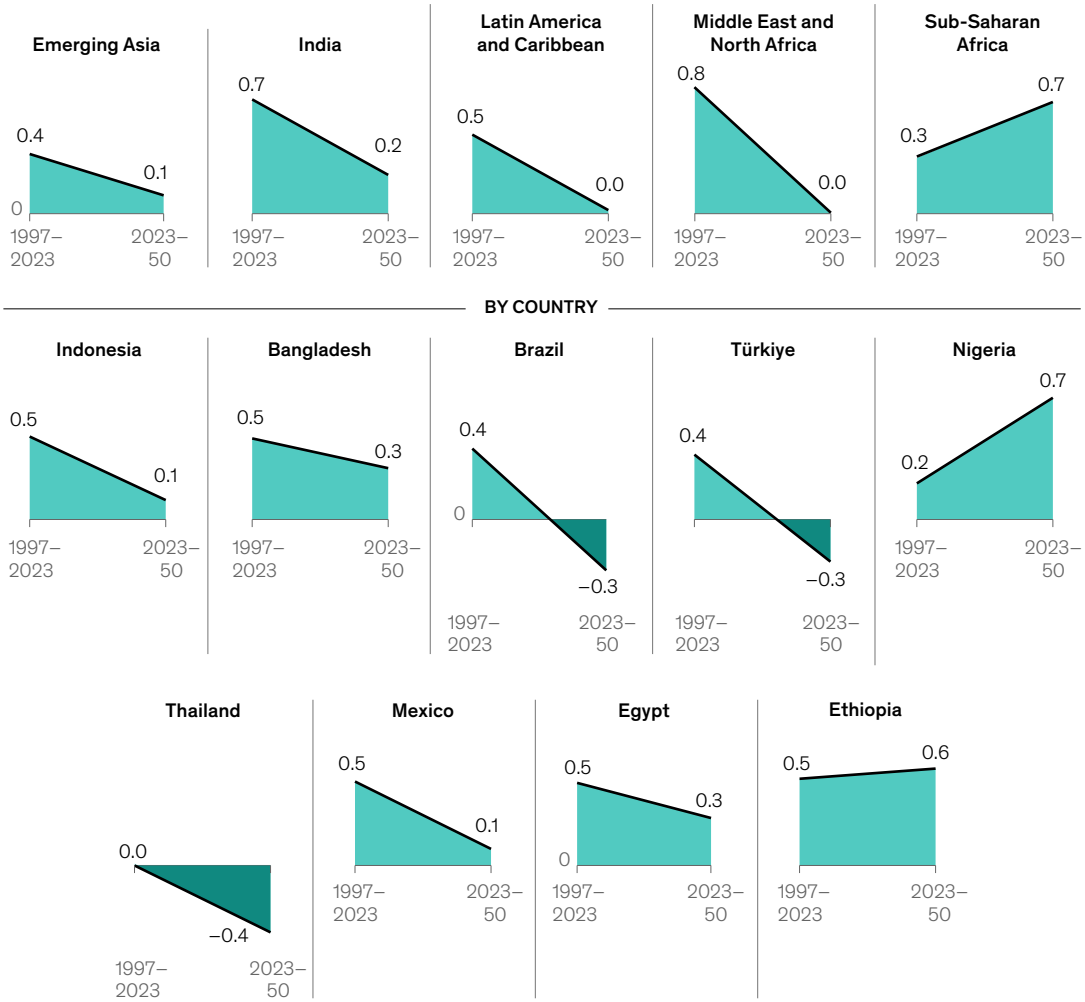
Over the past quarter century, GDP per capita increased in most later wave regions as a result of increasing working-age populations as a share of total population, creating a demographic dividend. Yet in most regions, this dividend will diminish or disappear entirely by 2050. Only in Sub-Saharan Africa will the dividend increase over the next 25 years compared with the past quarter century. This will aid growth, provided countries in the region create incentives to invest in human and physical capital and infrastructure (Exhibit 34).

Take India. The dividend added 0.7 percentage point each year on average to the country's GDP per capita growth, but as the age mix skews older, it will contribute only 0.2 percent annually on average to Indian incomes to 2050. In Latin America and the Caribbean, the shifting age mix has added an average of 0.5 percent to GDP per capita over the past quarter century, but its contribution will fall to zero over the next 25 years. In Mexico, real GDP per capita will be $2,600 less in 2050 due to the changing age mix compared with what it would be were there no shift in age mix. Conversely, the demographic dividend will *increase* GDP per capita in Sub-Saharan Africa, which will gain an average of 0.7 percent annually to 2050, more than double the 0.3 percent annual rate of growth over the past 25 years.

Exhibit 34

The demographic dividend of the last quarter century will diminish or disappear by 2050 in all later wave regions except Sub-Saharan Africa.

Contribution of age mix to hours worked per capita growth, 1997–2023 vs 2023–50, %



Source: *World Population Prospects 2024,* United Nations; ILOSTAT; The Conference Board; McKinsey Global Institute analysis

McKinsey & Company

Between 2023 and 2050, Sub-Saharan Africa will increase its working-age population by 650 million. However, these new workers will boost GDP per capita growth and realize the benefits of the demographic dividend only if they can find good jobs. Today, many workers in the region hold low-wage, low-productivity jobs; in 2018, 90 percent of people living there were informally employed.[69] More than half its population—and as much as 69 percent in Chad, for example—works in the low-productivity agriculture sector.[70]

Boosting productivity is key to raising living standards ahead of demographic shifts

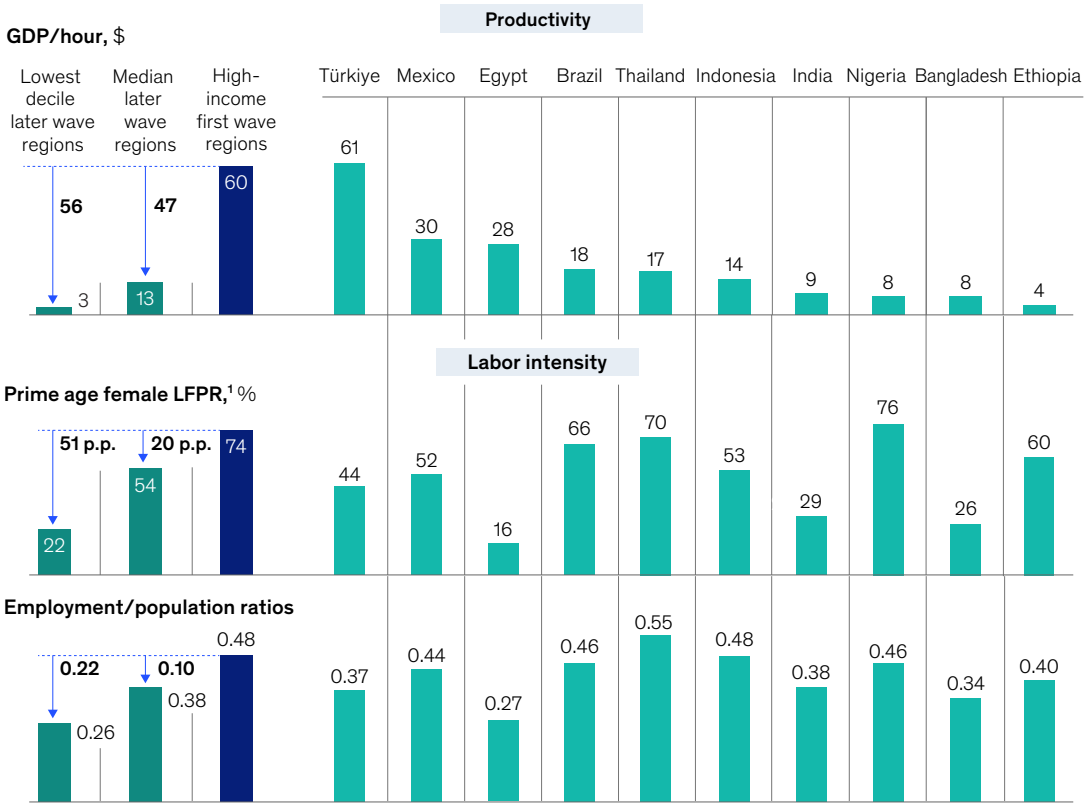
The per capita GDP of an economy is determined by the size of its workforce relative to population and the productivity of each worker. Later wave economies have the opportunity to develop a "flywheel" effect in which productivity gains encourage investment that, in turn, spurs further productivity gains and so on. This leads to meaningful employment opportunities and boosts purchasing power, thus expanding opportunities for companies to invest in even more productive capacity. Absent such investment, workers in these emerging economies will struggle to find gainful work opportunities and accumulate the savings their economies need to finance retirement.

Since the first spin of the wheel depends on increased productivity, the biggest priority for countries in later wave regions is to boost productivity growth, converging with levels of high-income economies. The productivity gap today is large in later wave regions, ranging from $3 per hour in the bottom decile to a median of $13 per hour compared with $60 an hour in high-income countries. In fact, closing this gap is important for the world economy at large, given the profound implications it has for global productivity (see sidebar "Labor pools and global productivity").

Countries with lower productivity levels can experience catch-up growth by creating conditions to raise investment and spurring innovation that generates higher initial returns on new capital (Exhibit 35).

Exhibit 35

Increased productivity and labor intensity can help make up for the falling demographic dividend.



Note: We have excluded non-sovereign UN entities, countries with population less than 2 million, and outliers. Figures may not sum to 100%, because of rounding.
[1]Defined as labor force participation rate (LFPR) for women aged 20–49 years old.
Source: *World Population Prospects 2024*, United Nations; ILOSTAT, Oxford Economics; McKinsey Global Institute analysis

McKinsey & Company

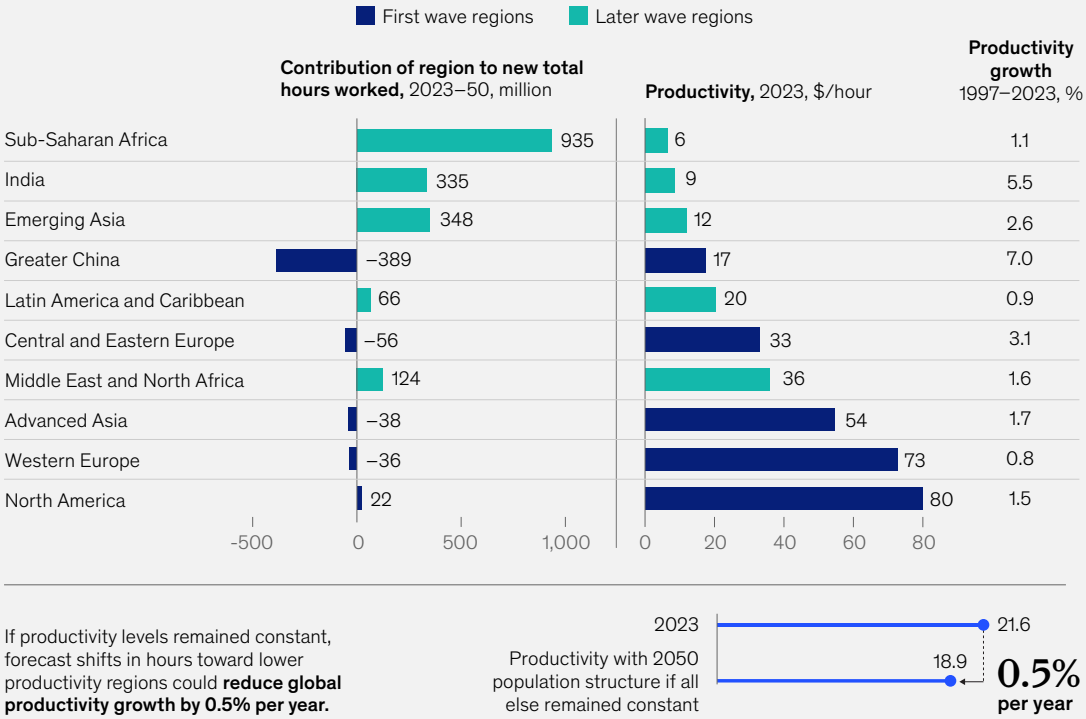
Sidebar: Labor pools and global productivity

First wave regions are significantly more productive today than later wave regions. For example, productivity per hour worked is as high as $80 in North America and $73 in Western Europe, while India's productivity per hour is $9 and Sub-Saharan Africa's just $6. But later wave regions have the potential to improve productivity as their aggregate hourly contribution to global labor pools increases (exhibit).

If productivity per hour of work remains constant in all regions and working hours shift to later wave regions, as changing demographic structures suggest they will, total average global productivity would drop by 12 percent to 2050, or 0.5 percent a year on average. This underscores the importance of increasing productivity in later wave regions.

Exhibit

Total employment will grow relatively more in less productive regions, potentially reducing global productivity growth by 0.5 percent per year.



Source: ILOSTAT; *World Population Prospects 2024,* United Nations; The Conference Board; Oxford Economics; McKinsey Global Institute analysis

McKinsey & Company

However, emerging economies have had mixed success in raising productivity. Over the past quarter century, some "fast-lane" economies narrowed their productivity gap rapidly.[71] Yet at their current pace of productivity improvement, several "slow-lane" economies that are home to 1.4 billion people would never match advanced-economy levels. Then there are the additional 1.3 billion people living in "middle-lane" economies where productivity is growing only slightly faster than in advanced economies, meaning it would take them more than 100 years on average to converge. Unless these slow- and middle-lane economies accelerate their productivity growth, their populations will get old before becoming rich.

Fast-lane economies have made progress toward narrowing their productivity gap with advanced economies at a rapid pace. India's annual productivity grew 5 percent on average over the past quarter century, while Cambodia's and Bangladesh's grew at about 4 percent. Productivity in middle-lane countries, such as Egypt, Indonesia, and Kenya, has grown only slightly faster, about 2 percent on average, than in advanced economies. The opportunity is large. If Indonesia were to improve its productivity by $5 per hour worked, it would result in a 34 percent increase in GDP per capita.

The need to jump-start productivity growth is most pressing in Latin America and the Caribbean and in Sub-Saharan Africa. Sub-Saharan Africa's annual productivity growth was 1.1 percent on average over the past quarter century, while Latin America's grew by 0.9 percent. To be sure, there are countries within these regions that have increased productivity faster, such as the Dominican Republic and Rwanda, at 2.3 percent and 3.8 percent, respectively. But most countries in these regions are in the slow lane.

In addition to—and, in many ways, facilitated by—productivity growth, later wave regions have opportunities to boost labor intensity, in some cases reversing trends of the past. While the demographic dividend has increased GDP per capita over the past quarter century, changes in participation rates in these regions have offset some of those gains. For example, a changing age mix that increased the working-age population in India helped increase GDP per capita by 0.7 percent on average from 1997 to 2023. However, labor intensity fell by 1.1 percent over the same period, more than offsetting the positive impact of a bigger working-age cohort. This was in part because more younger people remained in school longer and attained more robust educations, a welcome development, but it also reflects stagnating labor force participation rates among women.

Indeed, the female labor force participation rate in the median economy in later wave regions is 54 percent, or 20 percentage points less than in the median first wave country, although the rate varies widely, from 16 percent in Egypt to as high as 76 percent in Nigeria, according to the International Labour Organization. If India were to increase its female labor force by ten percentage points, it would increase its GDP per capita by 4 to 5 percent.

Even among people already in the labor force in late wave regions, unemployment, underemployment, and employment in informal or low-productivity activities are persistent problems. Raising capital investment and creating jobs in more productive sectors would create opportunities to engage labor forces in more gainful work. If Brazil increased its employment-to-population ratio by four percentage points, GDP per capita could increase by 8.7 percent, for instance.

Later wave countries can capitalize on opportunities and sidestep foreseeable problems

Businesses and governments in later wave countries can learn from the experiences and trajectories of first wave countries navigating the demographic shift today and leverage their comparative advantages. By doing so, they can boost productivity and GDP per capita and set a course to successfully navigate their own aging in one to two generations, keeping two broad objectives in mind.

The first objective is to leverage the advantages of a youthful population to compete in the global economy. Later wave countries can develop their relatively young populations into the highly skilled workforces the world will need. Investment in developing human capital should start with today's children. For example, improving nutrition to prevent stunting and wasting will deliver returns many times over. Similarly, investing in high-quality and accessible education for children and young adults can help build the crucial job skills needed for workers to be highly productive. Developing robust public infrastructure, including on the digital front, is crucial for later wave countries.

As the center of gravity of global consumers and talent tilts toward later wave regions, policy makers and businesses can also support the development of the next generation of global superstar

companies. Previous MGI research has found that developing economies that outperform their peers are propelled by large, competitive companies.[72] Nurturing such businesses requires creating an environment conducive to their growth and innovation, including robust institutions, necessary physical infrastructure, intellectual property protections, and the ability of companies to leverage outside investment and partnerships.

The second objective is to design and implement effective and sustainable support systems for the elderly and for society at large. Learning from the successes and failures of first wave countries will be crucial here. Old-age support systems in later wave countries are often informal and family based, but as countries develop, they should anticipate pressure for stronger and better-integrated social support systems for seniors.[73] At the same time, the looming burden of a senior gap that needs to be increasingly funded through public debt in first wave countries (as we described in chapter 2.3) should make later wave governments cautious about what they promise. It will be vital to create retirement systems that emphasize fiscal sustainability and acknowledge the realities of declining fertility and increasing longevity as well as their implications for supporting aging populations. Financial inclusion and incentives for private savings and wealth accumulation today can be bedrocks for economic resilience in the future.

Another foreseeable problem that later wave countries could sidestep with early action is that of burgeoning healthcare costs. Younger countries can invest in the health and well-being of their young to middle-aged populations to keep them thriving well into older age. This includes investing in access to preventive healthcare and public education to increase "healthspans." Research from the McKinsey Health Institute has identified specific actions that governments and businesses can take to promote healthy longevity, ranging from accelerating innovation and health measurement to scaling specific interventions proven to promote healthy aging.[74]

To get rich before getting old, later wave regions will need to pull on all growth levers. Companies aiming to capitalize on the opportunities that will arise in later wave countries will play an important role, alongside infrastructure and public services that policy makers can provide. By compensating for a dwindling demographic dividend with more productive jobs, populations of later wave countries can ensure a better chance of navigating demographic change successfully.

4. Responding to a new demographic reality

Over the next quarter century—and perhaps beyond—demographics is destiny. Changing population structures have already begun forcing changes in business operations and production and altering long-standing social norms and practices. As demographic shifts pick up steam, however, we can no longer simply react in isolation to each of the tectonic changes they will compel. Workforces, productivity, global trade, family structures, and the social contract all will change as a result of the impact—and we haven't even begun to grasp the feedback loops these changes may kick off.

The long-term effects of falling fertility rates will reach far

The economic calculus that has improved living standards for so many people around the globe for so long will need to change—and profoundly. In previous chapters, we've examined individually the effects of aging on economic growth, labor markets, consumption, and the gap that nations will face in sustaining senior consumption. Yet these factors are not independent. The world is powered by an interconnected economic system with feedback loops that reinforce one another. As demographic drags intensify and low fertility rates compound and snowball into population decline, there could be potential knock-on effects for aggregate demand, investment, the generation of innovative ideas, and, ultimately, productivity that go beyond the economic consequences we have outlined.

In particular, depopulation could affect many sectors of the economy in unanticipated ways. Just imagine schools needing to adjust to a precipitous drop in the number of students or even closing altogether, as they already have in some places. Many home buyers today look for houses with "in-law rooms" to accommodate aging parents, yet the value of those homes could plateau or decline if the number of households shrinks. For decades, rural communities have faced plateauing home prices as they lost people to fast-growing urban centers, but whole nations depopulating would have significantly more severe consequences. Declining asset prices and shrinking pools of workers to generate income could challenge debt sustainability and the social contract, sparking struggles that reverberate throughout society.

The challenges go beyond the economic hurdles that we have examined—they could have big implications for human development and the geopolitical balance. On the human development side, shifts in the weights of global population could amplify the importance of issues such as gender parity and child nutrition, as more population growth occurs in regions that lag behind on these dimensions. Shifting global demographics will also influence the reconfiguration of global trade flows. The view of future global interconnections will require a new lens that incorporates demographic changes in the aperture as the world's center of gravity tilts toward later wave regions in the coming half century. Businesses can consider talent supply as an additional factor to shape their global footprint, along with the shifting global map of consumers. Meanwhile, policy makers can weigh options to secure longer-term access to human capital by investing in infrastructure and education in less developed later wave regions.

Societies are entering uncharted waters as they address changing population trajectories

Looking to the longer term, forecasts of the balance of population are not necessarily fixed. As the reality of the demographic shift sets in, social discourse about fertility rates and aging is escalating, and issues to do with population size, growth, and composition are increasingly becoming the flashpoint of many local and national debates. Society at large will increasingly engage in questions and choices about fertility and migration, particularly in first wave countries but increasingly in later wave ones as well.

Relatedly, fundamental questions about families, their structures, and where they live will arise. How many children to have and who should take care of them—alongside parents who are living longer and longer—will raise difficult questions about cultural norms, social standards, and traditional, gender-based expectations of caregiver roles and whether and how they could change. So far, countries have struggled to have these difficult conversations, but the dialogue will continue.

Policy makers have attempted to turn back the clock on societal aging by implementing family-friendly policies and economic incentives to remove barriers to raising the fertility rate, among other objectives. These have met with limited success; no country where the fertility rate has ever fallen below 1.9 has a rate above replacement today. At the same time, we have limited experience of concerted efforts to cause fertility to rebound across a range of countries or subnational regions, and so we can't clearly foresee what the future might look like. Scientific discovery may kick in, for example, mitigating contributors to low and falling fertility rates or resulting in innovation in reproduction that shifts people's willingness to have more children. Cultural shifts may be triggered by changing societal attitudes and human behavior in a myriad of ways that are more conducive to rising fertility rates.

Even as societies grapple with grave long-term implications of changing demographics, businesses and policy makers have many options in the shorter term. Improved child- and eldercare programs can help increase labor force participation and encourage workers to plan for families alongside work. Tailored migration programs can attract workers who have in-demand skills, provided migrants are well integrated into both labor markets and society more broadly.

Economic responses to societal aging are already visible and will intensify

Businesses and policy makers are changing their strategies and processes to reflect the emerging reality of an older population with a shifting global footprint, and we will both need and see more innovation on the following fronts in the coming decade.

— *Doubling down on productivity growth through investment.* Productivity has grown sluggishly in much of the world over the past two decades, and the need for it is strongest in places, sectors, and skill categories where labor supply is tightening the most. Recent MGI research suggests that occupations with historically low productivity and low productivity growth, such as healthcare, construction, leisure and hospitality, and professional services, will be most affected by the demographic shift.[75] Automation and AI technologies hold great potential to augment dwindling workforces, and companies can develop more strategic reskilling practices for humans to work alongside machines, which can increase productivity. Policy makers can find opportunities to increase public investment in infrastructure and R&D, creating conditions that generate adequate returns on investment for productive enterprises that are the biggest force creating jobs and raising living standards.

— *Creatively managing an older workforce to sustain productivity.* The concept of retirement has blurred and may become an outdated construct altogether with societal participation later in life. More flexible work hours could encourage retirees to pick up part-time work, even as companies build their capacity to hire from these nontraditional labor pools and onboard older workers with the coaching and mentorship they need to succeed. Creating opportunities specifically for seniors is important: 19 to 25 percent of respondents aged 65 and older surveyed by the McKinsey Health Institute say they want to work but are not currently doing so for a variety of reasons, including a lack of attractive opportunities and societal barriers.[76] In first wave regions already experiencing youth scarcity, companies have begun focusing more on opportunities to hire senior workers. For example, CVS, the drugstore chain, is tapping some of its older customers to be employees through a program called Talent Is Ageless.[77] CVS supports mature workers with working arrangements like telecommuting, flexible time, job sharing, and compressed work weeks. It also offers continuing career education. ANZ, the Australia and New Zealand bank, launched an age diversity strategy to create a workplace culture where "age is no barrier." It includes multiple career extension options, eliminating qualifications-based career advancement, and age-inclusive recruitment ads.[78]

— *Tapping the potential of senior consumers.* Businesses will face shifts in the relative sizes of markets as the purchasing power of senior consumers grows while that of younger consumers plateaus or shrinks. Demand at the category level will change, with society needing more healthcare and less education. Within-category shifts, for instance more dog strollers and fewer baby strollers, are changes that have implications for product portfolios. Companies will need to shed tired stereotypes and generalizations about older consumers and gain granular consumer insights to reach varied segments of seniors effectively. Some companies are already making significant bets on older consumers. For instance, Nestlé Health Science, a division of Nestlé devoted to nutrition, health, and wellness, shuttered a baby food manufacturing facility in Ireland due to declining birth rates in China. Now it plans to offer more supplements and nutritional products aimed at the needs of seniors to, say, manage their weight or blood sugar levels.[79] Vayyar in Israel has developed sensor technology to help detect falls and reduced mobility among older adults; the technology doesn't require cameras and wearables but instead uses radar systems to maintain privacy.[80] In Canada, Silverts offers innovative, fashionable, adaptive clothing and shoes for older adults, with fewer small buttons and hooks, to allow older adults to remain independent longer.[81] Not all needs of senior customers are obvious. In the Netherlands, for example, Jumbo Supermarket created "chat checkout" lanes in its grocery stores.[82] These allow for a slower checkout process aimed at providing an opportunity for older adults to converse with the cashier to combat an increasing problem of loneliness among seniors.

— *Managing dependency through increased workforce participation.* Policy makers in many advanced economies have taken steps to reform pension systems to encourage older people to work longer. For example, Italy's reform of early retirement in 2011 raised labor force participation among 55- to 64-year-olds from roughly 40 percent to 60 percent in 2023 (for more on pensions, see sidebar "Pension tensions: Sense on the dollar?"). Policy makers also can promote age-friendly workplaces, for example, by promoting flexible work arrangements in the public and private sectors and addressing barriers that prevent older adults from working. Additionally, policy makers can take steps to expand workforce participation, particularly among women. In Japan, for instance, "Womenomics" policies provide daycare support and tax incentives to boost female labor force participation, which increased 12 percentage points from 2010 to 2023, double the initial goal.[83] Policy makers can also invest in lifelong learning opportunities and retraining initiatives to enable adaptation to changing job market demands. Examples include Singapore's SkillsFuture program, which retrains workers 65 years and older, and voluntary welfare organizations that help seniors make career transitions and financial plans for retirement.[84]

— *Evolving fiscally sustainable systems for an aging world.* Policy action coupled with corporate talent for innovation will be essential to develop substantially new approaches to pensions and retirement savings. First wave economies might consider ways to help citizens save for retirement from a younger age, for example via tax-advantaged retirement investment accounts. Steps to boost affordable healthcare services, including long-term care, could reduce the costs of longevity to individuals and society. Policy makers can avoid expensive rewiring by designing public services to address the demographic profile of the future. For instance, urban design and zoning can be optimized to account for future needs, such as zoning for smaller housing units to better suit a future with fewer children. Investing in public amenities that support aging in place would allow seniors to maintain independence and mobility, reducing the need for public resources. Policy makers can also encourage healthy living through public health campaigns that promote access to nutritious foods and provide opportunities for physical activity to facilitate healthy longevity.

▪ ▪ ▪

The uncertainties of demographic change will persist for decades, and societies will need to wrestle with them. Meanwhile, the world will need to learn to live with the change, at least in the short term, and policy makers and civil society will need to inform and guide choices that society at large must make over the coming half century.

Acknowledgments

The research was led by Anu Madgavkar, a McKinsey Global Institute (MGI) partner in the New Jersey office; Marc Canal Noguer, an MGI senior fellow in the Barcelona office; Chris Bradley, a McKinsey senior partner in the Sydney office and a director of the McKinsey Global Institute; Olivia White, a senior partner and MGI director in the Bay Area office; Sven Smit, a senior partner in the Amsterdam office and MGI chair; and TJ Radigan, an engagement manager in the Greater Boston office.

TJ Radigan and Madeleine Idoux, an engagement manager in Paris, led the project team, which included Yacine Radi Benjelloun (alumnus), Hugo Clerget, Mauricio De Zarobe, Lilian Lu, Francesca Pagani, Shreyangi Prasad, and Ananya Sivaraman. We are grateful to Stephanie Strom, senior editor, who helped write and edit the report, and to Juan M. Velasco, senior data visualization editor, who designed the charts.

For kindly sharing insights, we thank MGI academic advisers Martin Baily, senior fellow emeritus in economic studies at the Brookings Institution; Hans-Helmut Kotz, resident fellow at the Center for European Studies and visiting professor of economics, both at Harvard University; Rakesh Mohan, president emeritus and distinguished fellow at the Center for Social and Economic Progress; and Sir Christopher A. Pissarides, a Nobel laureate in economics and the Regius Professor of Economics at the London School of Economics. We also thank our former adviser Alan Taylor, professor of international and public affairs at Columbia University and an external member of the Bank of England's Monetary Policy Committee.

We are also grateful to a number of other experts who generously shared their time, perspectives, data, and support. They include Adrien Auclert, associate professor of economics at Stanford University; Jesús Crespo Cuaresma, professor of macroeconomics at WU Vienna University of Economics and Business; Ignacio Fernández-Huertas, director of the budget analysis division, Autoridad Independendiente de Responsabilidad Fiscal (AIReF); Homi Kharas, cofounder and chief economist, and Wolfgang Fengler, CEO, of World Data Lab, along with Matthew Cooper and the rest of the WDL team; Andrew Mason, emeritus professor, department of economics, University of Hawaii, and founding director of the National Transfer Accounts Project; Ció Paxtot, professor of economics, University of Barcelona; Andrés Rodríguez-Pose, Princesa de Asturias Chair and professor of economic geography at the London School of Economics; and Andrew J. Scott, director of economics at the Ellison Institute of Technology Oxford and cofounder of The Longevity Forum.

Many McKinsey colleagues gave us valuable input and guidance. We want to thank Rebecca J. Anderson, Tamara Charm, Jeffrey Condon, Gemma D'Auria, Kweilin Ellingrud, Ellen Feehan (alumna), Pragun Harjai, Brad Herbig, Sylvain Johansson, Ahmed H. Khan, Dymfke Kuijpers, Krzysztof Kwiatkowski, Camillo Lamanna, Tarek Mansour, Jan Mischke, Neeraja Nagarajan, Marco Piccitto, Jose Maria Quiros, Jeongmin Seong, Cannon Shipman, Shubham Singhal, Tilman Tacke, Simone Tai (alumna), Nikol Vargas (alumna), and Peixi Wang.

In MGI's publishing team, we would like to thank Rachel Robinson, Rishabh Chaturvedi, Janet Bush, and David Batcheck. In communications, our thanks go to Rebeca Robboy, Nienke Beuwer, Ashley Grant, Crystal Zhu, and Cathy Gui. Thanks also go to McKinsey's design team, especially Diane Rice, Nathan R. Wilson, and Janet Michaud. We are also grateful for the collaboration of McKinsey's digital production team, including Mary Gayen, Katie Shearer, Dana Sand, Charmaine Rice, and Regina Small.

As with all MGI research, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution. While we gathered a variety of perspectives, our views have been independently formed and articulated in this report. Any errors are our own.

Glossary

Age mix: The age composition of a population, representing the proportion of people in different age groups at a specific time. This composition changes over time as a result of populations aging and changes in fertility rates, longevity, and migration.[85]

Age-related public expenditures: Spending composed of public expenditures, which vary according to the age of constituents; for example, pensions, healthcare, and education.

Demographic dividend: The benefit a country accrues when the growth rate of its working population outstrips that of minors and seniors, setting the stage for population-driven economic growth and prosperity.[86]

Demographic drag: The opposite of demographic dividend. If fertility rates remain low over the long run, population dynamics negatively affect economic growth, as older cohorts that are not in the labor force grow faster than cohorts of working individuals.[87]

Depopulation: The sustained net decrease in population size in a defined territory over time.

Labor intensity: The amount of work done per person at each age, measured as weekly hours worked per person in an age group (increments of five years) across both workers and nonworkers in the population.

Net migration: The net total of migrants during a period; that is, the number of people who enter a region (immigrants) minus the number of people who leave a region (emigrants), including citizens and noncitizens.[88]

Population pyramid: A graphic illustration of a population's age structure, with the x-axis representing the number of men (on the left) and women (on the right) across different age groups, which are plotted on the y-axis. In economies with high birth rates, this graph takes the form of a pyramid, with a wide base representing a high share of young people and the number of individuals decreasing progressively in older age groups.[89]

Productivity: A measure of output relative to input. We focus on labor productivity, which is defined as GDP per hour worked. This is a commonly used productivity measure and the most consequential determinant of long-run economic and real wage growth.[90]

Replacement rate: The level of fertility, or live births per woman, at which each generation exactly replaces itself without migration but including mortality up to reproductive ages. This is typically about 2.1 births per woman when mortality is very low.[91]

Senior gap: The gap between the total consumption and the labor income earned within a given year by seniors aged 65 and over. For a senior to maintain consumption, this gap needs to be "filled" via personal savings, returns to assets, public transfers such as pensions, and private transfers such as family care.

Support ratio: A ratio that compares the number of individuals aged 15 to 64 years, or working age, to the population aged 65 and over. It provides a rough indicator of the number of working-age people who could support seniors economically and socially.[92]

Total fertility rate: The average number of live births that a hypothetical cohort of women would have at the end of their reproductive period, assuming that during their whole lives, they had the single-year fertility rates of a given period. It is expressed as live births per woman.[93]

Weekly hours per capita: The total annual working hours per person for an entire population divided by 52 weeks (regardless of holidays). This is distinct from the number of hours worked *per worker*, which measures the average (or, in some cases, modal) number of hours worked by those in the labor force in a week.

Working-age population: The share of 15- to 64-year-olds in the total population. A basic indicator of potential employment, it includes the economically active population and the economically inactive population.[94]

Endnotes

Introduction

1 We primarily focus on demographics in relation to populations and age distributions. While we recognize the significance of changes in other demographic categories, including race, gender, and other population characteristics, they are not the focus of this report.

2 The International Monetary Fund's World Economic Outlook classifies 39 economies as "advanced," based on factors such as high per capita income, exports of diversified goods and services, and level of integration in the global financial system. The remaining countries are classified as "emerging market and developing" economies. Rupa Duttagupta and Ceyla Pazarbasioglu, "Miles to go: Emerging markets must balance overcoming the pandemic, returning to more normal policies, and rebuilding their economies," *Finance & Development*, Summer 2021.

3 See, for example, Matthew J. Delventhal, Jesús Fernández-Villaverde, and Nezih Guner, *Demographic transitions across time and space*, National Bureau of Economic Research working paper number 29480, November 2021; "Making babymaking better: A special report on the future of fertility," *Economist*, July 22, 2023; and Charles Goodhart and Manoj Pradhan, *The great demographic reversal: Ageing societies, waning inequality, and an inflation revival*, Palgrave MacMillan, 2020.

Chapter 1

4 Ole J. Benedictow, *The Black Death 1346–1353: The complete history*, first edition, Great Britain, Boydell Press, 2006.

5 The word "fertility" has a different meaning in the vernacular compared with its use among demographers. In demographic terms, the total fertility rate is the total number of children each woman in a population would be expected to have over her lifetime if the fertility rates at each age remained constant over time. The United Nations defines replacement-level fertility as 2.1 children per woman over her lifetime, which represents the rate needed to keep population flat over time.

6 Jesús Fernández-Villaverde, a researcher in economics and demographics, argues that the world is already below the replacement rate. Some UN fertility rates are slightly higher than reported by some countries, and the world's replacement rate is slightly higher than 2.1, given gender bias in some countries and higher infant mortality rates. He discusses his research on "How does low fertility affect economic growth, worldwide? Jesús Fernández-Villaverde," *Rocking our priors* podcast, Alice Evans, October 2, 2024.

7 For more, see *Pixels of Progress: A granular look at human development around the world*, McKinsey Global Institute, December 7, 2022.

8 Advanced Asia consists of Australia, Japan, New Zealand, Singapore, and South Korea.

9 Examples of countries that will have fewer people in 2050 than today include China, Germany, Italy, and South Korea, while some countries that will have more people by 2050 but decline thereafter are Ireland, Sweden, Switzerland, and the United Kingdom.

10 Sub-Saharan Africa's population is projected to increase by 2.23 billion from now to 2100, while the total global population will increase only 2.09 billion due to declining populations in all other regions combined. To be sure, this total figure masks variation between individual regions that offset each other: for example, North America will continue to gain population while China will shrink.

11 Based on population projections from *World Population Prospects 2024*, United Nations, July 2024, and hours per capita estimates from ILOSTAT. Hours per worker, participation, and employment are assumed to be constant for each age and sex over the period.

12 World Data Lab, 2024.

13 See, for example, Worldwide Governance Indicators, World Bank.

14 Unprecedented outside disasters; see "Population, 10,000 BCE to 2023," Our World in Data, accessed November 24, 2024.

15 Charlotte Lytton, "Could South Korea's maternity retreats solve its population crisis?" *Telegraph*, April 8, 2024. South Korea's president said the country has poured more than $200 billion into programs to raise fertility rates in the past 16 years. However, the country's fertility rate has kept falling. Ashley Ahn, "South Korea has the world's lowest fertility rate, a struggle with lessons for us all," NPR, March 19, 2023.

16 "President Novák: Pro-family is answer to demographic crisis," About Hungary, Cabinet Office of the Prime Minister of Hungary, June 9, 2023.

17 "Daily cash benefits at childbirth and parental leave," *Nordic Health & Welfare Statistics*, September 9, 2024.

18 John Burn-Murdoch, "Why family-friendly policies don't boost birth rates," *Financial Times*, March 28, 2024.

19 For more, see Melissa S. Kearney and Phillip Levine, "The causes and consequences of declining US fertility," in *Economic policy in a more uncertain world*, Melissa S. Kearney and Amy Ganz, eds., Aspen Institute, December 2022; and Elizabeth Brainerd, *Can government policies reverse undesirable declines in fertility?* IZA World of Labor, 2014. For a review of the literature on cash incentives, see Lyman Stone, "Pro-natal policies work, but they come with a hefty price tag," *Institute for Family Studies*, March 5, 2020.

Chapter 2

20 This accounts for every person in these age brackets, including those unemployed or outside the labor force. Hours worked *per worker*, which we analyze later, are higher.

21 "Díaz warns employers about working hours: 'We are in the final stages of negotiation,'" *El País*, October 21, 2024.

22 For more information about past GDP per capita growth, or the future target by country, see chapter 2, Exhibit 15. The target for China is adjusted downward relative to past growth, from 7.7 percent to 4.9 percent, and for South Korea from 3.2 percent to 2.0 percent, based on the growth trajectory of countries that developed earlier.

23 Sonja Wind, "Four-day work week pilot convinces most German firms in trial," Bloomberg, October 18, 2024.

24 For more, see *Investing in productivity growth*, McKinsey Global Institute, March 2024.

25 For more, see "The economic potential of generative AI: The next productivity frontier," McKinsey, June 2023.

26 "Statistical communiqué of the People's Republic of China on the 2023 national economic and social development," National Bureau of Statistics of China, February 29, 2024.

27 In fact, all else being equal, higher fertility rates may reduce GDP per capita growth in the short to medium term, because the denominator (number of people) increases without necessarily increasing the numerator (GDP). Dynamically, other forces, such as additional births increasing demand, may also raise GDP, but these are unlikely to be enough.

28 Based on migration from 2015 to 2019, before COVID-19 pandemic disruptions.

29 Based on OECD indicators of foreign-born participation rates in persons aged 15 to 64.

30 Lance Pritchett, *Rotational labor mobility is the biggest global economic opportunity*, London School of Economics working paper, June 2024.

31 Of course, some gap is expected as individuals save during working years and spend those savings in retirement. Differences in the level of this gap may reflect differences in rational preferences about

how much an individual wants to consume before retirement versus during retirement. As such, the absolute level of the senior gap is less informative than the change in the gap over time. This analysis is inspired by the "old-age gap," a concept conceived by Andrew Mason and Ronald Lee. See Andrew Mason et al., "Six ways population will affect the global economy," *Population Development and Review*, volume 48, number 1, March 2022.

32 Calculated based on data from World Data Lab and from OECD, "General government spending by destination, individual," 2022, adjusted for purchasing-power parity.

33 Economists have long held that consumption, like labor, follows an inverted U-shape indicating that those 65 years and older consume less than those in middle age. This shape is a result of consumption as typically measured at the household level. Middle-aged households generally include children and thus have more people, making their expenditure as a unit larger than that of smaller households like those of elderly couples. However, adjusted for household size, consumption grows with age. Data from Eurostat shows that household consumption peaks when the head of the household is aged 45 to 59 years, but average individual consumption peaks past age 65 when household size is taken into account. This produces a flattened, slightly upward sloping consumption curve rather than the traditional inverted U.

34 Andrew Mason et al., "Six ways population change will affect the global economy," *Population Development and Review*, volume 48, number 1, March 2022.

35 To calculate the future aggregate gap, we assume the senior gap stays fixed for each individual and then measure the effect of adding the additional population aged 65 and older projected by the United Nations.

36 Significant differences exist between countries, such as the prevalence of private employer pensions in the United States, which could have an impact on these estimates and complicate direct comparisons between countries.

37 *Pensions at a glance 2017: OECD and G20 indicators*, OECD, December 2017.

38 Total tax revenue and category-level government expenditure data is taken from the OECD, UK Office for Budget Responsibility, CaixaBank Research, Tax Foundation, Centers for Medicare and Medicaid Services, Spanish Ministry of Health, and National Transfer Accounts. In the United States, it is divided among age categories using data from the Tax Foundation. In Spain, it is divided using sources including the Ministry of Health and NTA. In the United Kingdom, it is divided using data from the UK Office for Budget Responsibility.

39 This is not a forecast but rather a sizing of a momentum case—what could happen in a hypothetical future if only demographics change. Individuals and governments are likely to respond to changing conditions in ways that would influence these outcomes.

40 *The long-term budget outlook: 2024 to 2054*, Congressional Budget Office, March 2024.

41 "General government gross debt," International Monetary Fund (IMF), accessed November 26, 2024.

42 "General government spending," 2021, OECD, accessed November 26, 2024.

43 "Revenue statistics—OECD countries: Comparative tables," updated March 27, 2024.

44 Past MGI research has found that higher asset prices accounted for about three-quarters of the growth in net worth between 2000 and 2020, while saving and investment accounted for the balance. For more, see *The rise and rise of the global balance sheet: How productively are we using our wealth?* McKinsey Global Institute, November 2021.

45 Ana Hernández Kent and Lowell R. Ricketts, *The state of U.S. wealth inequality*, Federal Reserve Bank of St. Louis, October 2024. *Trends in the Distribution of Family Wealth: 1989 to 2022*, Congressional Budget Office, October 2024.

46 The US Census Bureau defines a householder as "the person (or one of the people) in whose name the housing unit is owned or rented (maintained) or, if there is no such person, any adult member, excluding roomers, boarders, or paid employees. If the house is owned or rented jointly by a married couple, the householder may be either the husband or the wife. The person designated as the householder is the 'reference person' to whom the relationship of all other household members, if any, is recorded."

47 "Distribution of household wealth in the U.S. since 1989," US Federal Reserve, updated September 20, 2024.

48 Two factors explain this. First, older individuals have higher homeownership rates than younger cohorts, at 82 percent compared with 64 percent for average adults. Second, most seniors have owned their homes for longer, enabling them to pay off bigger portions of their mortgages and benefit from increasing real estate prices for longer.

49 Robert R. Callis, "Younger householders drove rebound in U.S. homeownership," US Census Bureau, July 25, 2023; "Mortgage status by age of householder," US Census Bureau, accessed November 26, 2024.

50 World Data Lab. Data not available to distinguish imputed rent from actual rents paid.

51 Burkhauser, Butrica, and Wasylenko found that 39 percent of US adults aged 55 and older moved over a ten-year period from 1985 to 1995. In 2000, Bayer and Harper found that 12 percent of adults aged 75 and older moved over a five-year period. Richard V. Burkhauser, Barbara A. Butrica, and Michael J. Wasylenko, "Mobility patterns of older homeowners: Are older homeowners trapped in distressed neighborhoods?" *Research on Aging*, 1995. Ada-Helen Bayer and Leon Harper, "Fixing to stay: A national survey of housing and home modification issues," AARP, 2000.

52 Rachel Warren, "Average stock market return," *Motley Fool*, updated November 4, 2024.

53 "73 percent of civilian workers had access to retirement benefits in 2023," *Economics Daily*, US Bureau of Labor Statistics, accessed November 26, 2024.

54 "House price index datasets," US Federal Housing Finance Agency, accessed November 26, 2024.

55 "Median household income in the United States," Federal Reserve Bank of St. Louis, updated September 11, 2024; Jessica Semega and Melissa Kollar, *Income in the United States: 2021*, US Census Bureau report P60-276, September 13, 2022; Robert Shiller, "Online data Robert Shiller," Yale University, accessed November 26, 2024; "Home price to income ratio," Longtermtrends, accessed November 26, 2024.

56 Jonathan Jones, "Cities with the highest home price-to-income ratios," Construction Coverage, updated June 29, 2024.

57 Yuko Hashimoto, Gee Hee Hong, and Xiaoxiao Zhang, "Demographics and the housing market: Japan's disappearing cities," *IMF Working Papers*, volume 2020, number 200, September 2020.

58 Assuming current age-specific employment, labor force participation rate, and hours worked per week persist through 2050. This forecast is likely to be conservative. Some evidence suggests that the labor force participation rate among the elderly increases as a country ages, as has been seen in Japan, for example.

59 The share of workers over 50 is approximated by those in 50- to 79-year-old age group, because ILOSTAT does not publish hours estimates for individuals aged 80 and older.

60 Over the past 25 years, increasing incomes have spurred the largest increases in consumption, while growing populations and demographic shifts have played a secondary role. Between 1997 and 2023, increasing incomes explained almost 80 percent of aggregate consumption growth, and as population growth stagnates over the next quarter century, higher incomes are likely to explain almost all of consumption growth.

61 These ceteris paribus calculations are based on today's consumption patterns. As fertility rates fall and middle-aged households become smaller on average, this could cause increases in the consumption levels of remaining household members.

62 "Health expenditure per capita," in *Health at a glance 2023: OECD indicators*, OECD, November 2023.

63 Category consumption estimates are based on responses to household-level surveys. Expenditure is allocated among age groups using a marginal effects model, which estimates the additional amount a household would spend on average if it gained one new member in a given age group. Data and marginal effects calculations are from World Data Lab.

64 These World Data Lab figures represent household healthcare expenditure based on US consumer expenditure surveys as well as payments made by Medicare and Medicaid on behalf of individuals. They do not reflect all components of healthcare expenditure included in GDP, for example capital investment and R&D. Therefore, they cannot be compared directly to estimates by the Centers for Medicare & Medicaid Services of National Health Expenditure, which are higher.

65 We have looked at what spending would be in 2050 if each age cohort continued to spend the same amount on each category, without considering shifting preferences or growing incomes.

Chapter 3

66 Espen Beer Prydz and Divyanshi Wadhwa, "Classifying countries by income," World Bank, September 9, 2019.

67 The World Bank lower threshold for a high-income country is $14,000, not adjusted for purchasing power, in 2023. The upper threshold for a low-income country is $1,145. Other economies are considered middle income.

68 Our projections are based on projections made by the IMF through 2030 and World Data Lab from 2030 to 2050. A constant growth rate is used after 2050, which may represent an optimistic scenario, because growth rates tend to decline over time as countries develop. Sub-Saharan Africa is excluded here because first wave support ratios will not be reached until far beyond available GDP projections.

69 "Informality in Sub-Saharan Africa," in *Global economic prospects: Darkening skies*, World Bank, January 2019.

70 Mariama Sow, "Figures of the week: Sub-Saharan Africa's labor market in 2017," Brookings Institution, January 11, 2017.

71 For more, see *Investing in productivity growth*, McKinsey Global Institute, March 2024.

72 For more, see *Outperformers: High-growth emerging economies and the companies that propel them*, McKinsey Global Institute, September 2018.

73 Sri Wening Handayani and Babken Babajanian, eds., *Social protection for older persons: Social pensions in Asia*, Asian Development Bank, 2012.

74 For more, see Martin Dewhurst, Katherine Linzer, Madeline Maud, and Christoph Sandler, "Living longer in better health: Six shifts needed for healthy aging," McKinsey, November 2022.

Chapter 4

75 For more, see "Help wanted: Charting the challenge of tight labor markets in advanced economies," McKinsey Global Institute, June 2024.

76 "Age is just a number: How older adults view healthy aging," McKinsey Health Institute, May 2023.

77 "Talent Is Ageless," CVS, accessed November 26, 2024.

78 "Diversity and inclusion," ANZ, accessed November 26, 2024.

79 Madeline Speed, "Nestlé CEO says feeding ageing populations a priority as birth rates fall," *Financial Times*, June 2, 2024.

80 Vayyar Care.

81 "Universal dressing solutions," Silverts, accessed November 26, 2024.

82 "Jumbo opens 'chat checkouts' to combat loneliness among the elderly," Dutch News, September 28, 2021.

83 "Womenomics is pushing Abenomics forward," *We Are Tomodachi*, Government of Japan, Summer 2014.

84 "SkillsFuture Singapore," Government of Singapore, updated November 22, 2024.

Glossary

85 Hannah Ritchie and Max Roser, "Age structure," Our World in Data, February 2024.

86 *Demographic dividend atlas: The future is young*, United Nations Population Fund, accessed November 26, 2024.

87 Rainer Kotschy and David E. Bloom, P*opulation aging and economic growth: From demographic dividend to demographic drag?* National Bureau of Economic Research working paper number 31585, August 2023.

88 "Net migration," DataBank, World Bank, accessed November 26, 2024.

89 "Demographic change," Glossary of demographic terms, Max Planck Institute for Demographic Research, accessed November 26, 2024.

90 For more, see *Investing in productivity growth*, McKinsey Global Institute, March 2024.

91 *World Population Prospects 2024: Methodology of the United Nations population estimates and projections*, United Nations Department of Economic and Social Affairs, July 2024.

92 "Old-age support ratio," in *Society at a glance: Asia/Pacific 2019*, OECD, March 2019.

93 *World Population Prospects 2024: Methodology of the United Nations population estimates and projections*, United Nations Department of Economic and Social Affairs, July 2024.

94 "Working age population," OECD, accessed November 26, 2024.

McKinsey Global Institute
January 2025

Designed by the McKinsey Global Institute

mckinsey.com/mgi

@McKinsey_MGI
@McKinseyGlobalInstitute
@McKinseyGlobalInstitute

Subscribe to MGI's podcast, *Forward Thinking:*
mck.co/forwardthinking