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Embracing Demographic Transition

Health and Wealth in an Aging World

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EMBRACING DEMOGRAPHIC TRANSITION

Health and Wealth in an Aging World

One of the most dramatic societal shifts of the 21st century will be the demographic transition to a population that is older than it ever has been.

In the nineteenth century, no continent had a life expectancy of more than 40 years. By 2019, the average person could expect to live to 73 years old. Driven by declining childhood mortality and improved access to high-quality healthcare, these gains in life expectancy are an extraordinary achievement of global development.

Declining fertility compounds population aging, and it is driven by efforts in global development too. Rising rates of education and increased access to contraception have pushed down the number of children that families have.

Yet population aging has far-reaching consequences that governments, businesses, and wider society must reckon with. Economists have already sounded the alarm bells on some of these consequences: a ballooning older population will be dependent, they say, on a working-age population that is too small to support it.

We argue that, while the trend towards a population that is older than it ever has been is intractable, the trend towards an increasingly dependent one need not be.

In this report, we collate perspectives from across Citi and our global network to explore how our extra years of life expectancy can be lived as social contributors rather than dependents. From these expert contributions, we find that supporting the health and wealth of an aging population are the levers to pull if our aim is to minimize the dependence of an aging population. We see four dimensions:

- **Maximizing the economic contribution of older groups**, including evolving labor markets in support of longer working lives.
- **Supporting economic resilience in later life**, through financial inclusion and incorporating longevity into financial planning.
- **Preventing the onset of dependence by supporting healthy aging**, including the shift to a more preventive healthcare system.
- **Ensuring access to affordable healthcare for all**, including boosting the supply of care work and joining up health and care systems.

This demographic transition is not happening in a vacuum: some wider shifts already abate the potential economic consequences of population aging. For example, technologies like artificial intelligence which could prop up the productivity of a shrinking workforce are already being adopted.

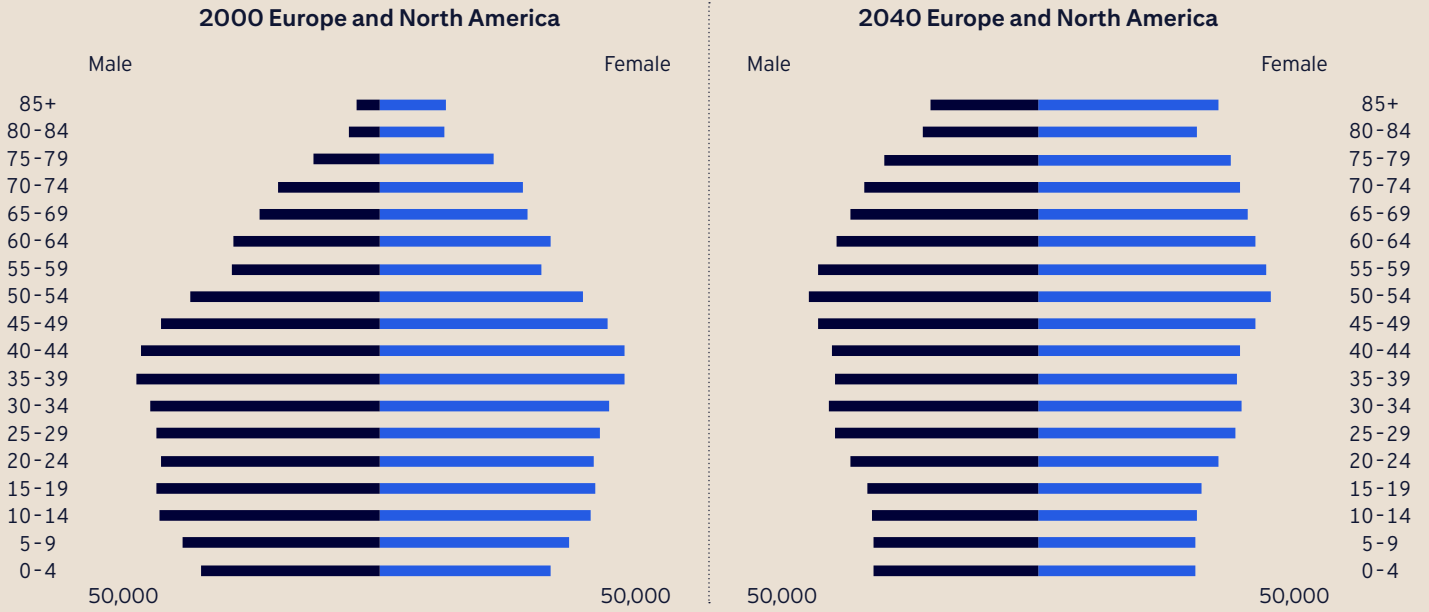
Other elements of the response require more action – like joining up health and social care or increasing labor market flexibility. We therefore conclude the report with concrete recommendations for businesses to respond to the demographic transition, which we have co-produced with the Global Coalition on Aging.

We hope this report helps to shift the discussion of population aging towards an optimistic vision in which we can spend our extra years as healthy and active participants in flourishing, and merely numerically older, societies. After all, what good are longer lives if we cannot truly *live* them?

Embracing Demographic Transition

Global population is older than ever

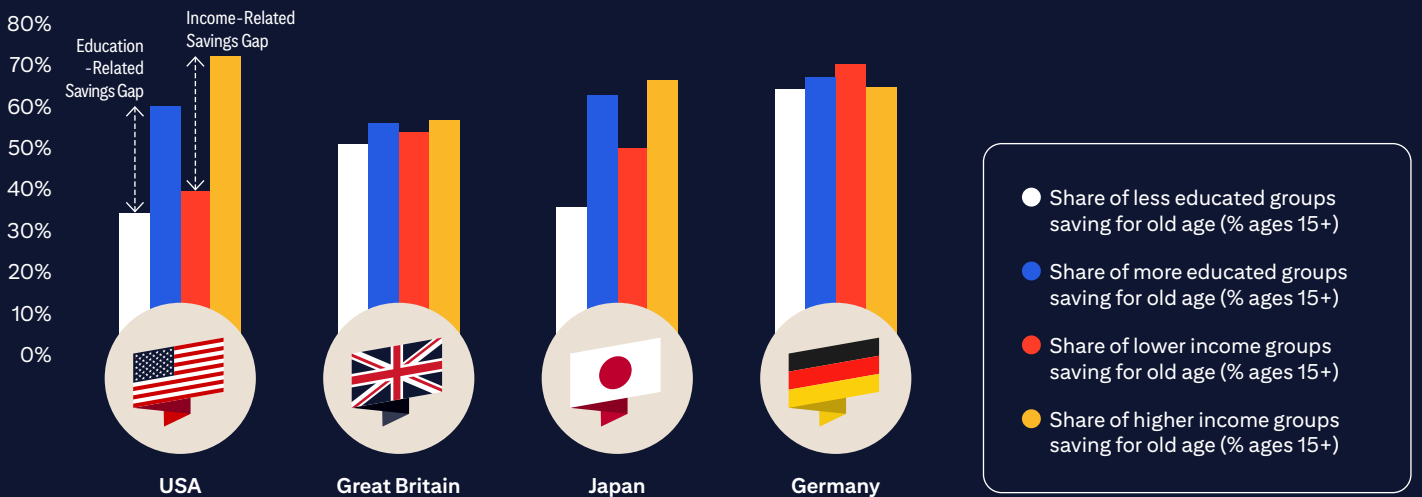
The “population pyramid” is changing shape. Increased life expectancy drives a widening at the top of the pyramid at the same time as declining fertility shrinks younger age groups at the bottom of it.



Source: UN World Population Prospects (2022)

Supporting economic resilience

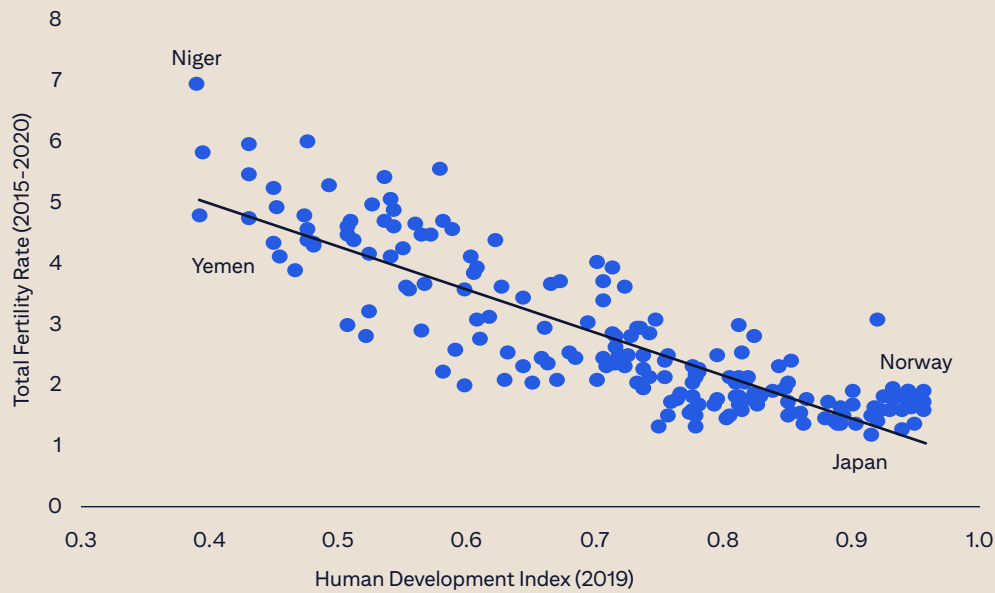
There are already concerns about the economic resilience of future retirees, especially those in lower socioeconomic groups.



Source: World Bank, Global Findex Database (2021)

Development drives aging

Declining fertility and increasing life expectancy have been among the aims of global development work for decades and they result in population aging. As development increases, fertility trends downwards.



Source: UN Human Development index (2024) and UN World Population Prospects (2022)



Increasing Life Expectancy



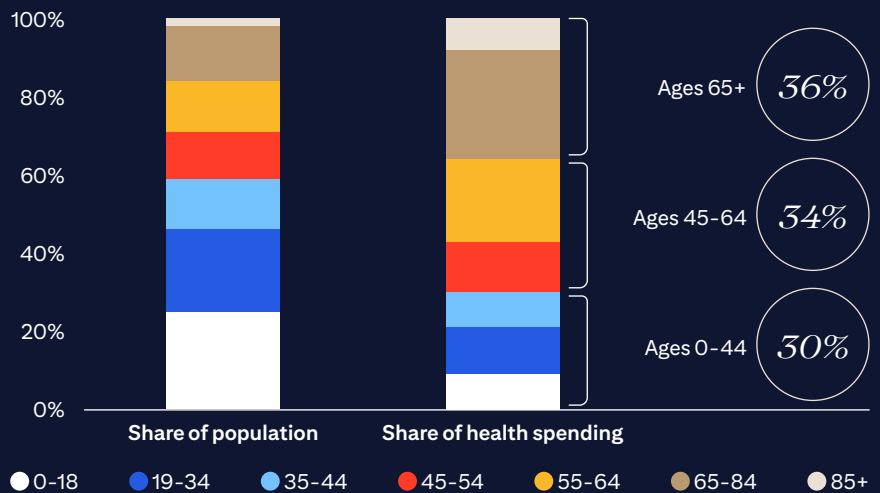
Declining Childhood Mortality



Access to Healthcare

Facilitating access to good health

An increasing number of over 65s might risk driving up healthcare-related spending.



Source: KFF analysis of 2021 Medical Expenditure Panel Survey data



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Foreword from Professor Ian Goldin



Professor Ian Goldin
Professor of Globalization and Development
Oxford University

Professor Goldin was the founding Director of the Oxford Martin School. During his decade as Director, the School established 45 programmes of research, bringing together more than 500 academics from across Oxford, from over 100 disciplines, and becoming the world's leading center for interdisciplinary research into critical global challenges.

He is currently Oxford University Professor of Globalization and Development, Senior Fellow at the Oxford Martin School, a Professorial Fellow at the University's Balliol College and responsible for the Oxford Martin School Programmes on the Future of Work, Technological and Economic Change and Future of Development.

He has published over 50 articles and 25 books, the most recent of which are *Age of the City* and *The Shortest History of Migration*.

The combination of lower fertility and aging is having a dramatic demographic and economic impact, and the world of business has an enormous role to play in shaping the societal response.

Life expectancy has increased by about 2 years per decade over the post-war period and globally, it's still increasing. At the same time, fertility is declining everywhere, and in over half the countries of the world is below the replacement level of an average of 2.1 children per adult woman.

A range of circumstances lead to changes in fertility rates and aging. These trends can be changed by disasters, wars, conflicts, pandemics, poverty, and economic crises – but generally as countries get richer and more urbanized, as women get rights and jobs, as girls get educated, and as contraception offers the potential to make choices, fertility declines.

The decline in fertility is destiny – and it's universal, across countries with different cultures, religions, and political systems. The increased cost of living associated with children – which includes needing bigger homes and paying for the cost of raising a child – is another factor. In rural communities, the benefits have also declined: children previously looked after the animals and helped with the harvest but fewer people now live in the countryside and young adults tend to leave home for the cities and are not around to care for their aging parents. The growing cost of children and the decline of family support systems is a global phenomenon, as is the progress, although much too slow, in women having more education, jobs and choice.

The consequences of this transition are manifold

As a result of the combination of fertility declines and an aging population, the workforce will contract, and dependency ratios will increase. A shrinking workforce means a declining tax revenue base at the same time expenditure to care for the elderly is increasing.

The consequences for social security and retirement are also significant. When social welfare packages were developed over fifty years ago, average life expectancy on retirement was about 7 years and real risk-adjusted returns were about 4%. Since then, average life expectancy has increased by over a decade, the age of retirement has come down, and real risk-adjusted returns are barely positive. The result is that people need to save 50 to 100 times more now than when these packages were built. Key questions are 'where will this money come from, which asset classes will it go to, and who will manage these investments?'

The consequences for consumption patterns are also significant: when elderly people spend down their savings, they will spend on different things to what they would have as young people. Increasingly, the elderly will hold onto their assets and the inter-generational wealth divide will get bigger. The growing share of elderly people in the population also means that they will become increasingly significant politically.

Aging will have to result in policy changes

Labor forces are currently built on the idea that you enter at about age 18 and exit around age 65 – or in some professions even earlier. This assumes that you have a growing labor force that can provide for dependents – both children and the elderly.

We need to shift expectations around retirement and pivot the labor market toward greater flexibility so that people can work well into their 70s, if they choose. This might involve facilitating part-time and remote working or otherwise changing the nature of work, including giving greater prestige to mentoring and charitable work.

We need to think about education systems that prepare people for longer working lives. If technology continues to develop at the rate that it is, relying on education only up to age 18 will be increasingly unfit for purpose. Continuous education will become more important.

Tax systems will need to evolve from a work-based system toward both a more wealth-based approach and broader definitions of income, by including income from property. We will not be able to balance the budget if our tax systems are based on income taxes and national insurance contributions from a diminishing workforce.

We need to rethink retirement ages and packages. Defined benefit packages are extremely risky, as we have seen with the volatility of returns. Combining them with improved life expectancy and declining workforces would be disastrous. Where they continue to exist, we need to move towards defined contribution packages.

Healthy aging is also key. One of the challenges of aging is the risk of many elderly people who are not active and become dependent. Addressing neurodegenerative diseases is particularly important: they are not being tackled as effectively as physical diseases. More people are living into their 80s and 90s who are physically well but mentally deteriorating. This poses growing care, cost and social burdens on families and economies.

Businesses must respond to the demographic transition

Businesses have responsibilities that impact on demography. These include maternity and paternity policies which allow people to have children and retirement policies that allow people flexibility as to when and how employees leave the work force.

As the population ages, firms will need to explore how to allow people to work in different ways and to work for longer. The danger that older workers dominate executive positions needs to be mitigated by ensuring rotation out of senior positions into collaborative and ambassadorial roles. This is necessary to prevent elderly people monopolizing leadership and blocking the promotion and career paths of younger people. Firms should shift towards a more circular approach to careers where more experienced workers can also choose to transition to other roles. The size of pension contributions and retirement packages will also become a growing preoccupation for employees given the inadequacy of projected savings relative to needs.

Among the questions that business leaders need to consider is their attitudes to migration. The need for migrants is growing in many societies and yet the politics is pushing in the opposite direction.

Demography is too important to be left to demographers. The decline in fertility, aging of societies and the role of migration will play a vital role in shaping the opportunities and challenges facing businesses and economies around the world. This timely report offers insights which greatly enrich our understanding of questions which we all need to understand and address.

Chapter 1: The Demographic Story

“The demographic future is not easy to manipulate, especially without violating human rights. Instead, we must plan for our demographic reality.”

- Melanie Channon and Jasmine Fledderjohan

Shifts in the basic structure of the family are driving a demographic transition that is one of the defining trends of our time. For generations, the family tree of living relatives was wide but not very deep: most people had many siblings as families had multiple children, but few generations were alive at the same time due to short life expectancies. Now family trees have gone vertical as families shift towards fewer children and an increasing number of generations’ lifetimes overlap. In the language of demographers, we have transitioned to low fertility and low mortality.

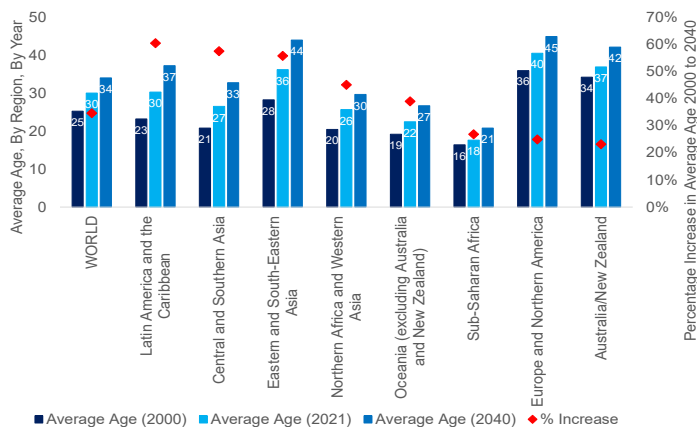
The drivers of the demographic transition – like longer lives, increased access to healthcare, and the ability to exercise choice over fertility – are positive achievements and the outcomes of global development. However, aging has significant consequences: the most significant from an economic point of view include the risk of a higher level of economic and social dependence on an ever-shrinking workforce. But while aging is inevitable, this increasing dependence is not. We therefore argue that population aging demands a response – in the shape of supporting economic resilience and facilitating healthy aging – rather than an attempt to reverse course.

Businesses, governments, and financial institutions can unite to minimize dependence by supporting the health and wealth of an aging population. This is especially urgent in higher income countries which are advanced in their demographic transition, and we conclude with some practical recommendations for businesses in higher income countries.

The global population is becoming older

The global population is becoming, in aggregate, older than it ever has been. Figure 1 shows that between 2000 and 2040, a 35% increase in the average age of the population is projected, from 25 in 2000 to 34 before mid-century.¹

Figure 1. Median age 2000, 2021, and 2040, by region



Source: UN Population Prospects

¹ Demographics can be forecasted with greater certainty than many other metrics. As the UN Population Division notes: “the size and age structure of the population over the next few decades are the result of demographic processes that have already taken place”. United Nations Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022: Summary of Results*, pp. 4

The average person in Europe and North America will be over 45 years old before the middle of this century.

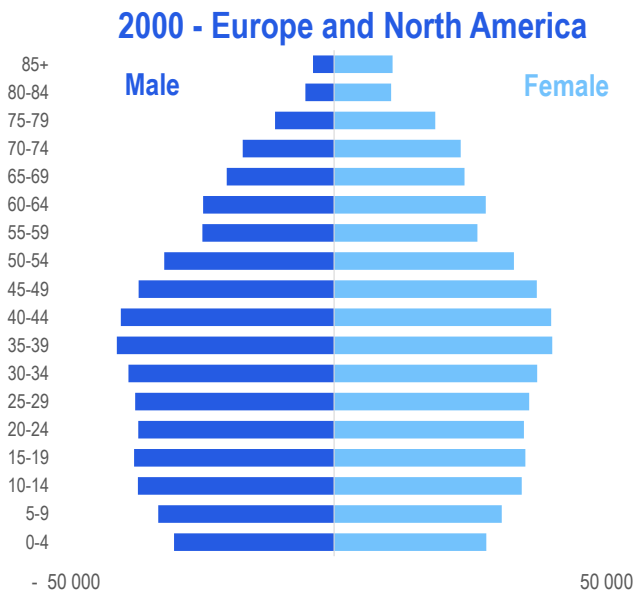
Variations exist between regions. The greatest projected age increases are in Latin America and the Caribbean – which expects a 60% increase between 2000 and 2040 – and Central and Southern Asia, which expects a 56% increase. Expected gains are lower in Europe and North America, reflecting the already higher average age but the average person in Europe and North America will be over 45 years old before the middle of this century. Clearly the demographic transition is not happening at the same pace in all places, but the trend is in one direction – toward an older population globally.

In Europe and North America, the demographic transition has already left its mark on the so-called population pyramid, which charts the distribution of the population across age brackets. Figure 2 and Figure 3 compare the structure of the population in Europe and North America in 2000 and 2040.

At the turn of the millennium, 14% of the population in Europe and North America was over 65; by 2040, it will be 25%.

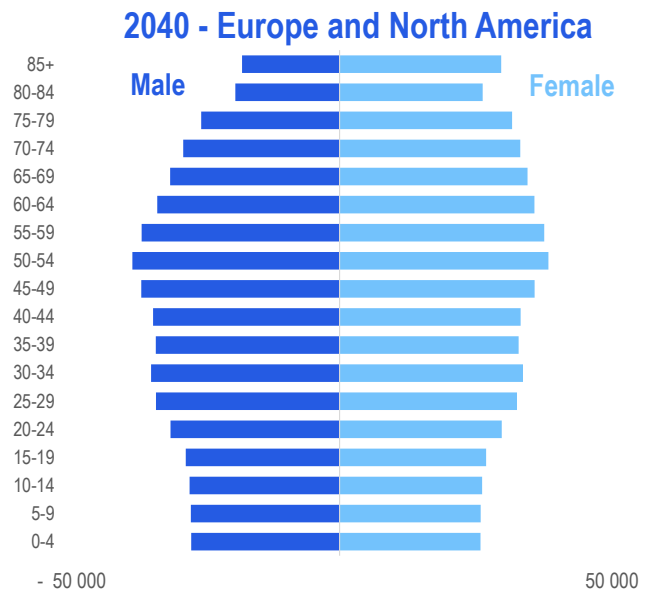
Two forces are acting on the population pyramid: 1) increased life expectancy drives a widening at the top of the pyramid and 2) declining fertility shrinks younger age groups. The top of the pyramid has ballooned as the number of older people increases. At the turn of the millennium 14% of the population in Europe and North America was over 65; by 2040 it will be 25%. At the same time, the bottom of the pyramid is now narrower than its middle: by 2040, there will be about as many over 65s as under 25s in Europe and North America. The consequence is a population that is older than ever before.

Figure 2. Population pyramid for Europe and North America - 2000



Source: UN Population Prospects

Figure 3. Population Pyramid for Europe and North America - 2040



Source: UN Population Prospects

In this chapter, we characterize the nature of the demographic transition and examine these twin drivers in increased life expectancy and declining fertility. We argue that these are positive outcomes of global development marking the culmination of decades of (continuing) efforts.

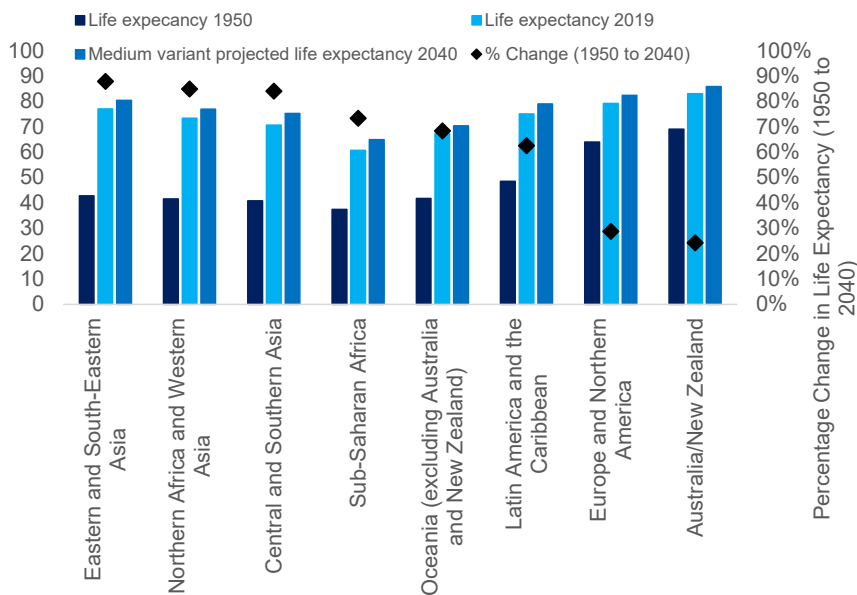
Increasing life expectancy drives population aging

Gains in life expectancy have contributed to population aging.² While there have been periods of decline – e.g., during pandemics and conflicts – the global trend over centuries is toward increasing life expectancy. In the 19th century, no continent had a life expectancy of more than 40.³ By 2019, the average life expectancy globally was 73. By 2040, life expectancy is expected to rise modestly again to 76, driven by increases in areas that currently have the lowest life expectancy.

In the 19th century, no continent had a life expectancy of more than 40. By 2019, the average life expectancy globally was 73.

This trend is more advanced in high income countries which have substantially higher life expectancies. Children born in 2019 in high income countries could expect to live to more than 80 years of age. A dent has been made in regional inequalities over the last century. Figure 4 shows that the greatest gains between 1950 and 2040 were on the Asian continent, where life expectancy was lowest at the beginning of that period and is expected to have almost doubled. As a result, the global population can be expected to age in coming decades, albeit at different rates.

Figure 4. Life expectancy at birth in 1950, 2019 and 2040, by region



Source: UN World Population Prospects (2022)

Increasing life expectancy is a long-desired outcome of global development.

In recent decades it has been driven by 1) declining childhood mortality and 2) improved management of noncommunicable diseases. Both are targets under the third UN Sustainable Development Goal.⁴

² United Nations Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022: Summary of Results*, pp. 4

³ Saloni Dattani et al. 2023, 'Life Expectancy' published online at OurWorldInData.org. Accessible [here](#).

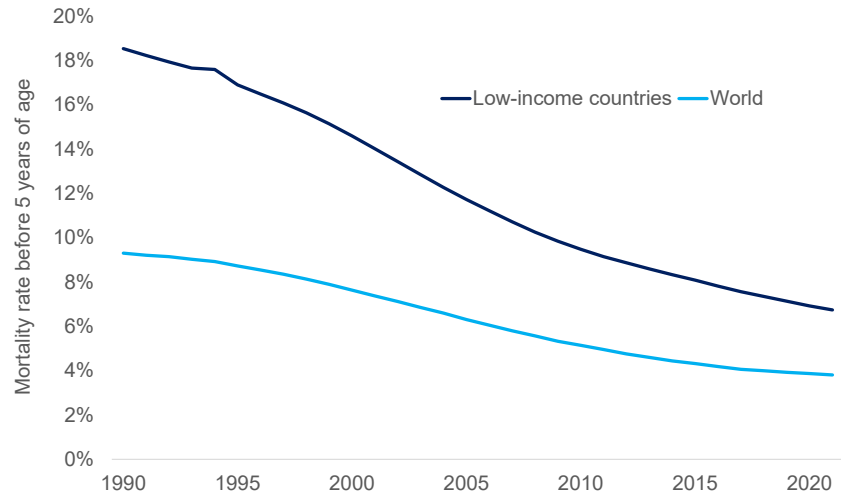
⁴ Targets 3.2 (Neonatal and child mortality) and 3.4 (Noncommunicable diseases)

Declining childhood mortality supports gains in life expectancy

In 2020, less than 4% of children died before their fifth birthday globally.

The first driver of increased life expectancy is declining childhood mortality. One estimate finds that even in the mid-19th century, up to 50% of children could expect to die before reaching the age of 15.⁵ Figure 5 illustrates the declining share of children who die before the age of five on a much reduced, 30-year time horizon. Marking an extraordinary achievement, in 2020, <4% of children died before their fifth birthday globally; in high-income countries, the figure is less than 1%.

Figure 5. Chance of death before age five has declined globally



Source: UN Inter-Agency Group for Childhood Mortality

Medical and social factors have combined to drive this progress.⁶ Medical factors like access to ante- and post-natal healthcare, sanitation and infection control, and vaccination coverage, have all contributed. Social factors, like access to nutrition and reductions in conflict, have also played a part in these extraordinary reductions in childhood mortality. Further reductions likely lie ahead and will power reductions in remaining regional inequalities in life expectancy.⁷

Treatments for chronic conditions support life expectancy at older ages

More than two-thirds of life expectancy gains in the last thirty years have been attributed to gains after age 60.

Life expectancy at older ages has also increased. A 45-year-old in 1950 could expect to live 24 years more while someone who turned 45 in 2019 could expect to live another 34 years. Declines in childhood mortality do not fully explain the global increase in life expectancy: in countries with a life expectancy of more than 75,

⁵ Max Roser, 2023. 'Mortality in the past: Every second child died,' published online at OurWorldInData.org. Accessible [here](#)

⁶ Despite this progress, we are not on track to achieve the target of <25 deaths before age 5 in every 1000 children codified in the UN SDGs. On the current trajectory, 53 countries will fail to achieve this target by 2030, including 25 countries after 2050 and 8 after 2099. See Emmanuel Yovo, 'Challenges on the road to achieving the SDG3.2 targets in resource-limited settings,' *The Lancet Global Health* 10.2 (2022)

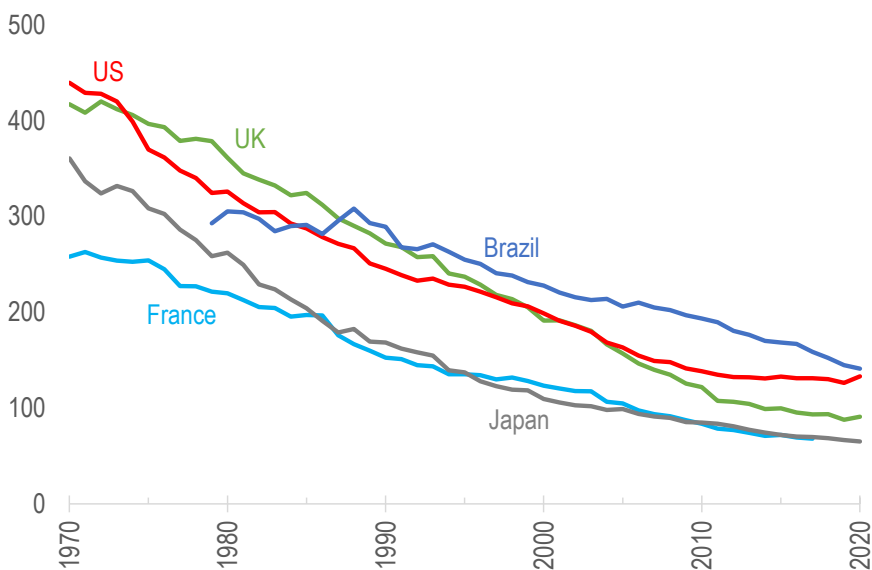
⁷ United Nations Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022: Summary of Results*, pp. 19

more than two-thirds of life expectancy gains in the last thirty years have been attributed to gains after 60 years of age.⁸

Social factors (like declining tobacco consumption) and medical factors (like improved mortality from cardiovascular diseases) have both contributed.⁹ As one paper puts it: “If the control of infectious diseases was the public health success of the first half of the 20th century, then the decline in mortality from coronary heart disease and stroke has been the success story of the past four decades”.¹⁰

Although cardiovascular disease and cancer are now the leading causes of death globally, the risk of death from them has declined as healthcare systems have become better at managing them. In the U.S., deaths caused by cardiovascular disease have fallen by 70% since 1970.¹¹ (Figure 6)

Figure 6. Age-adjusted mortality rate for cardiovascular disease, selected countries



Source: WHO Mortality Database 2022

Debate persists about whether the medical innovations which have driven increased life expectancy have increased *healthy* life expectancy to the same extent, i.e., whether our additional years are spent in good health. In the language of demography, the question is whether we have seen a “compression” or “expansion” of morbidity. It may be in our power to seek compression rather than expansion – in Chapter Four we explore how to maximize the additional years lived in good health.

In Europe and North America, fertility has been below “replacement level” since 1973

Declining fertility augments population aging

Declining fertility drives aging from the bottom of the population pyramid, reinforcing the impact of increased life expectancy at the top. The number of

⁸ UN Department of Economic and Social Affairs, 2023. *World Social Report 2023: Leaving No One Behind in an Aging World*, pp. 37

⁹ Mathers, C.D. et al. ‘Causes of international increases in older age life expectancy,’ *Aging* 385 (2015), pp. 540-548

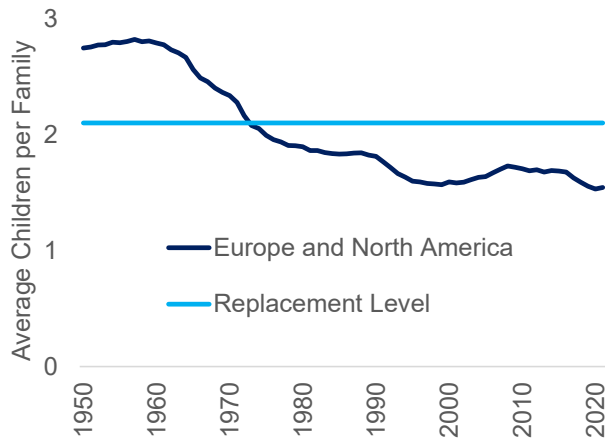
¹⁰ George A. Mensah et al. ‘Decline in Cardiovascular Mortality,’ *Circulation Research* 120.2 (2017), pp. 366-80

¹¹ See Citi GPS, [‘Future of Healthcare: The Oxford Prescription’](#) for discussion.

children that European and North American families have dipped below what demographers call “replacement level” of 2.1 children per family for the first time in 1973. This is the number of births required for the population to replace itself from one generation to the next, i.e., for the size of the population to remain constant.

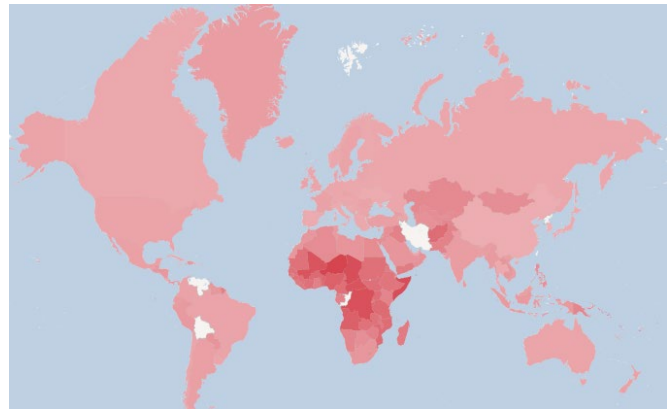
In Europe and North America fertility has never risen back above replacement level since it first dipped below. (Figure 7) This accounts for the narrower base of the population pyramid in this region – see Figure 2 on page 10 above. By 2040, the “pyramid” will be almost rectangular with about as many over 65s as under 25s.

Figure 7. Fertility dropped below replacement level in 1973 in Europe and North America



Source: UN World Population Prospects (2022)

Figure 8. Total Fertility Rate Globally, 2021



Source: UN World Population Prospects (2022)

The trend towards smaller families and fewer children is global, like the trend towards increasing life expectancy. Figure 8 shows that there is relatively little variation in fertility levels across the world. Darker red indicates a higher number of births per family, but this highlights very few countries on the African continent. Indeed, more than half of the population growth expected between 2022 and 2050 is concentrated in just eight countries¹² and more than 50% of countries already had a fertility rate below replacement level in 2021. The consequence is a global shift toward an older population, albeit at different paces in different places.

The drivers of declining fertility are twofold: 1) global development and increased empowerment of women and 2) changing preferences for smaller families with increased capacity to control fertility.

Declining fertility is a consequence of global development efforts

As development increases, fertility trends downwards

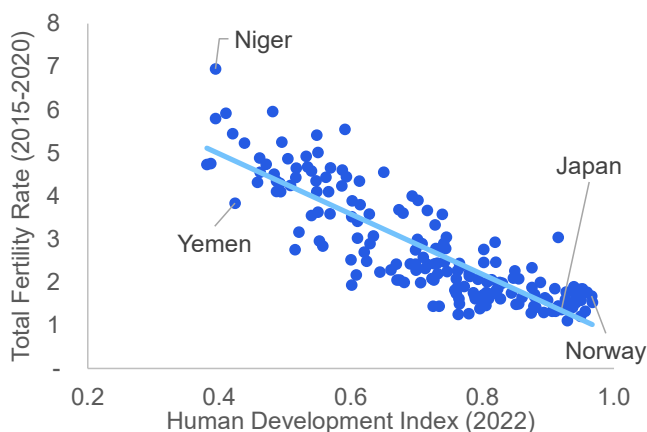
Lower fertility is correlated with development: as development increases, fertility trends down. (Figure 9) Niger is a striking illustrative example – it had one of the lowest scores in 2022’s Human Development Index at 0.39 and fertility in the period

¹² United Nations Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022: Summary of Results*, pp. i. Those countries are the Democratic Republic of the Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines and the United Republic of Tanzania

immediately prior stood at 6.95 births per woman – one of the highest in the world. At the other end of the spectrum, Norway scored 0.97 on human development and fertility stood at 1.68 births per woman. Reducing fertility rates has been an aim of global development in recent decades.

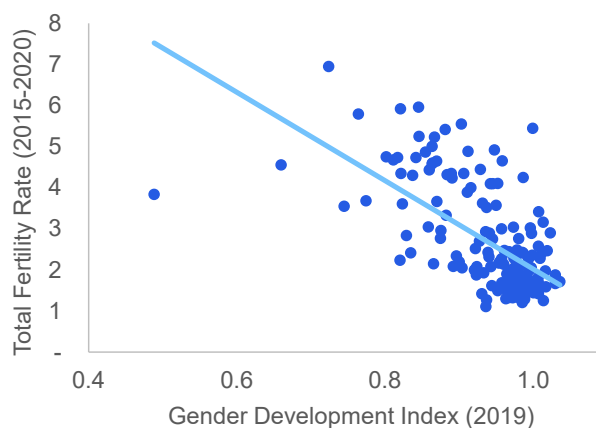
Increasing life expectancy is itself correlated with fertility: as life expectancy increases, families have fewer children. Indeed, gains in life expectancy are the constituent part of the Human Development Index with the strongest correlation with declining fertility. A high number of births has historically been a response to the expectation that some of those children will not reach adulthood. Demographers call this “child hoarding” and it declines with childhood mortality. These two demographic forces – life expectancy and fertility – therefore move to some degree in tandem.

Figure 9. Total Fertility Rate vs. Human Development Index



Source: UN Human Development Index (2024) and UN World Population Prospects (2022)

Figure 10. Total Fertility Rate vs. Gender Development Index



Source: UN Human Development Index (2019) and World Population Prospects (2022)

Women’s empowerment drives fertility down.

Within development women’s empowerment is strongly correlated with low fertility: countries with greater gender equality had lower levels of fertility. (Figure 10) In the context of the Gender Development Index (GDI) plotted above, women’s empowerment means the gap between men and women in three dimensions: long and healthy lives, education and schooling rates, and standards of living or economic resources.¹³

An example highlights the link: Yemen had a GDI score of 0.49 in 2019 and a fertility rate of 3.84 births per woman. At the other end of the spectrum, Finland had a GDI score of 0.99 and a fertility rate of 1.53. Professor Ian Goldin highlights in his foreword to this report the role that women’s increased participation in the labor force has played in driving fertility declines to date. (See pp.7)

The link between population aging and development continues. Improving women’s empowerment is among the aims of ongoing efforts in global development under the fifth Sustainable Development Goal.

¹³ UNDP. ‘Human Development Report 2023/24 Technical Notes: Calculating the Human Development Indices – Graphical Presentation.’ Accessible [here](#) [Last accessed April 16th 2024]

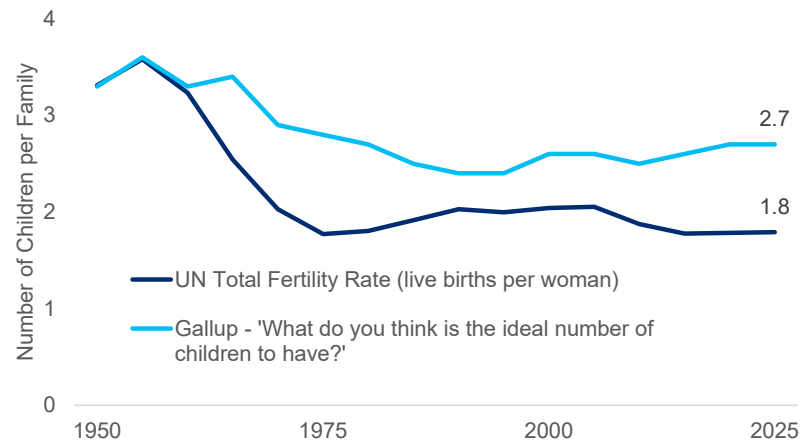
Ideal family size is declining, and fertility is more easily controlled

Preferences among men and women of childbearing age are shifting.

Preferences for smaller families further drive declining fertility. According to polling in the U.S., the number of children that families consider ideal has declined from a high of 3.6 in 1957 to 2.7 by 2023.¹⁴ (Figure 11) The drivers are complex, but polling data indicates that beyond a link between development and fertility, preferences among men and women of childbearing age are shifting.

Medical innovations have notably altered families' capacity to exercise choices about fertility. Contraceptive pills coming to market accounted for 40% of the decline in fertility between 1955 and 1965 in the U.S.^{15, 16} The UN Population Division has also drawn attention to the role of state-backed family planning programs in driving down fertility in higher fertility countries.¹⁷

Figure 11. Fertility rate is below self-reported ideal family size in the U.S.



Source: UN Population Prospects (2022) and Gallup polling (2023)

Fertility choices do not always reflect fertility preferences.

However, the fertility choices that men and women of childbearing age make do not always reflect the family size that they would prefer. Figure 11 also shows a significant gap between the number of children that American families think is ideal and the number of children they in fact have. A study of 10 European countries reported similar findings: the average intended family size was 2.1, while the average actual family size was just 1.58.¹⁸ This indicates obstacles to realizing fertility intentions and some prospect of fertility modestly increasing if the barriers could be adequately addressed.

¹⁴ Gallup, 'Children,' Accessible [here](#)

¹⁵ Bailey, M. 'Momma's got the pill: how Anthony Comstock and *Griswold v. Connecticut* shaped U.S. childbearing,' *American Economic Association* (2010), pp. 98-129

¹⁶ There is still a need to increase access to family planning globally. See UN DESA, 'Family Planning and the 2030 Agenda for Sustainable Development: Data Booklet.' Accessible [here](#)

¹⁷ UN DESA. 'World Population Policies 2021: Policies related to fertility' Accessible [here](#) [Last accessed April 16th 2024]

¹⁸ UN FPA Population and Development Branch, 'Policy responses to low fertility: How effective are they?' (May 2019) Accessible [here](#).

An effective policy response would focus on mitigating the costs and opportunity costs of raising children.

Policy interventions to directly boost fertility have been largely unsuccessful.¹⁹ However, studies have highlighted factors like a lack of affordable housing, poor job security, and labor market impacts for mothers as barriers to realizing fertility aspirations.²⁰ Professor Ian Goldin also draws attention to the increasing costs of having children. (See pp.7) A major constituent of these costs is childcare: in the UK, studies estimate that the cost of childcare increased by more than 60% between 2010 and 2021 vs. a 24% increase in overall prices.²¹ We should be cautious of attempts to boost fertility, but an effective policy response would likely focus on mitigating the costs and opportunity costs of raising children.

Conclusion: the demographic story is positive though economically consequential

Many parts of the world are experiencing a transition towards a population that is in aggregate older than it ever has been. This transition is an outcome of global development since it is driven by 1) increases in life expectancy and 2) declines in fertility.

Figure 12 reminds us of the good news headlines that have driven the population aging with which many countries are now reckoning. The fact that aging is driven by such outcomes suggests that reversing it is unlikely to be seen as desirable, even if it were possible – though attempts at reversal suggest the trend is somewhat intractable.

Figure 12. Achievements of global development, which now drive population aging

Headline	Measures	Sources
Increasing Life Expectancy	Global life expectancy in 2019 was 73 years. In the nineteenth century, no region had a life expectancy of more than 40 years.	Our World In Data
Declining Childhood Mortality	In the 19th century, 50% of children could expect to die before their fifth birthday. In 2020, that was 4% globally and 1% in high income countries.	Our World in Data
Healthcare Innovation	The number of deaths caused by cardiovascular disease in the U.S. has fallen by 70% since 1970	WHO
Control Over Fertility	Medical innovations like contraceptive pills have allowed families to make decisions about their fertility. In El Salvador, 28% of women used birth control in the mid 1970s and total fertility stood at 5.44 births per woman. By the mid 2000s, contraceptive prevalence had more than doubled and fertility had fallen to 2.72 births per woman.	University of Washington (2020)

Source: Various (cited within)

¹⁹ UN FPA Population and Development Branch, 'Policy responses to low fertility: How effective are they?' (May 2019) Accessible [here](#).

²⁰ OECD, 2019. Rejuvenating Korea: Policies for a Changing Society, Chapter 5. Accessible [here](#)

²¹ Farquharson C. and Olorenshaw, H. 'The Changing Cost of Childcare,' Institute for Fiscal Studies. May 2022. Accessible [here](#) [Last accessed April 16th, 2024]

Population aging is therefore a trend for businesses, governments, and financial institutions to respond to rather than reverse. As the sociologists Melanie Channon and Jasmine Fledderjohan have put it: *“The demographic future is not easy to manipulate, especially without violating human rights. Instead, we must plan for our demographic reality.”*²²

In what follows, Nathan Sheets, Citi Research Chief Global Economist, highlights the economic consequences that society must now reckon with. We do not need to speculate about what many of these consequences will be because some parts of the world are further through this demographic transition – Katsuhiko Aiba, Citi Research Japanese Economist, reflects on the economic consequences of Japan’s demographic transition to echo many of Sheets’ expectations.

²² Channon, M. and Fledderjohann, J. ‘8 billion people: why trying to control the population is often futile – and harmful’. *The Conversation* November 14, 2022. Accessible [here](#)

The Relentless Demographic Transition



Nathan Sheets, Ph.D.
Global Chief Economist, Citi Research

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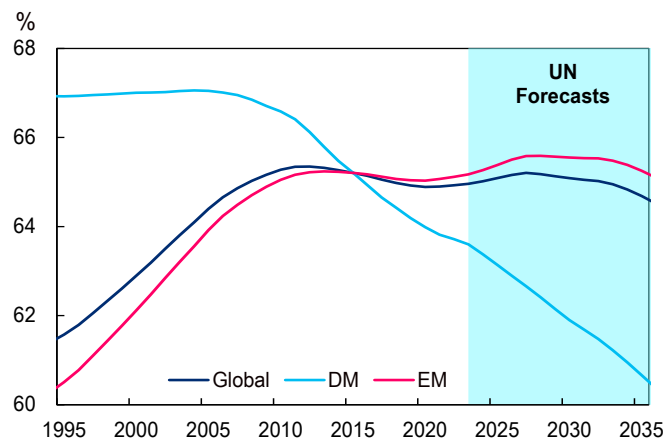
The global economy is in the midst of a relentless demographic transition. Over the past decade, the share of the working-age population—people 15 to 64 years old—has been in gradual retreat (Figure 13). And the United Nations projects that this decline will continue for many decades to come.

The shift is particularly sharp for developed market (DM) economies (Figure 14). Japan and the euro area are both expected to post sustained declines in their working-age population, while growth in the US and UK will continue to slow. Aging populations are also challenging some emerging market (EM) economies, notably including China and Korea. Countries including India and Mexico will continue to see positive growth, but at roughly half the pace recorded from 2000-2009.

These aging demographics are poised to have far-flung implications for the performance of the global economy and financial markets. By our reading, they are likely to bring less dynamic economic performance, including softer real GDP growth, higher public debt levels, and disinflationary pressures. Even so, demographics are not necessarily destiny — such effects may yet be pre-empted, or at least attenuated, by policy initiatives or evolving technologies.

The effects of aging demographics on real GDP growth are particularly notable. As one powerful channel, aging populations generally mean slower growth in the labor force, which has translated into weaker real GDP growth. Firms struggle to find the workers necessary to expand production.

Figure 13. Working-Age Population Share (15-64 Years)



Source: Citi Research, United Nations, Haver

Figure 14. Working-Age Population (Average Annual Growth, %)

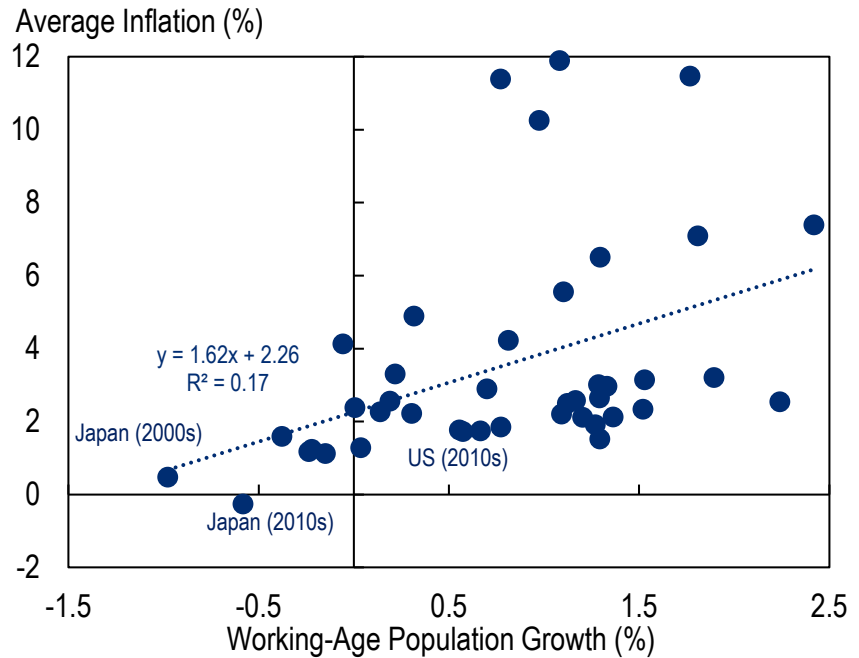
	Working-Age Population (Average Annual Growth, %)		
	2000-2009	2010-2022	2023-2040 (Proj.)
Developed Markets	0.5	0.0	-0.3
US	1.2	0.5	0.1
Euro Area	0.3	-0.2	-0.7
UK	0.8	0.3	0.0
Japan	-0.6	-0.9	-1.1
Emerging Markets	1.9	1.3	0.8
China	1.3	0.1	-0.7
India	2.2	1.6	0.8
Korea	0.5	0.3	-1.4
Mexico	2.0	1.5	0.5
Global	1.7	1.1	0.7

Source: Citi Research, United Nations, Haver

Aging demographics can also sap the strength of aggregate demand. As households age, they look toward retirement, which brings a higher desired saving rate. Once retirement arrives, spending tends to decline further as expenses associated with working — such as commuting costs and apparel expenditures — are reduced or eliminated. In addition, retirees may use their increased time to substitute toward home production of services (like food preparation and home maintenance) that were previously outsourced. Such effects have been seen in Japan since the 1990s and, more recently, in other DM economies as well.

The softening of aggregate demand also manifests itself in lower inflation. Empirically, the relationship between aging and inflation is nicely highlighted by the evidence in Figure 15, which shows decadal average inflation rates, starting in the 1980s, for a range of DM countries. The result is a striking positive relationship between growth of the working-age population and inflation.

Figure 15. Working-Age Population and Headline Inflation



Note: Decadal averages (60s, 70s, 80s, 90s, 00s, and 10s) for 10 Developed Market Economies; two outliers are excluded.

Source: Citi Research, United Nations, National Statistical Sources, Haver

This point, however, is increasingly being debated. Some observers have argued that the aging population — and the reduced availability of workers — should put upward pressure on wages and propel inflation higher. This argument is reasonable from a theoretical perspective, but strikes us as having little empirical support. Such forces simply have not appreciably been in play in Japan and other DM countries that have faced headwinds from aging.

Of course, central banks will also have a say in where inflation ultimately lands. But, by our reckoning, central banks should brace themselves for further disinflationary pressures.

A third important set of implications of aging involves fiscal policy. A rising share of older households means an increased draw on government resources to fund public pensions and provide healthcare. Further, to the extent that the labor force and real GDP grow more slowly, the tax base and government revenue will be correspondingly constrained. Hence, as countries age, pressures from rising public debt and budget deficits are likely to become more acute.

But a critical question is what all this means for the younger cohorts of the population who are still working? One clear implication is the likelihood of heavier tax burdens. But do younger workers respond to these burdens by demanding that the government commence programs to meet their needs as well? Or do they instead demand austerity to limit the overall fiscal burden and tax rates? Arguably,

we're already seeing these dynamics manifest themselves in different ways across countries.

As these economic forces play through, the upshot is likely to be reduced economic dynamism. But the implications for asset markets are mixed.

Notably, the lower inflation associated with aging is likely to also bring lower nominal bond yields, which is nicely aligned with performance over the past several decades (Figure 16). The effects on real rates, however, are less clear. Baseline economic models suggest that the slower growth should translate into lower real rates. Bonds should also be supported by demand from aging households looking to protect their nest eggs. At the same time, however, increased fiscal pressures could push up premiums in sovereign yields. Historically, these effects look to have roughly balanced out, with real rates showing a slight, but statistically insignificant, positive relationship (Figure 17).

Figure 16. Working-Age Population and 10-year Bond Yields

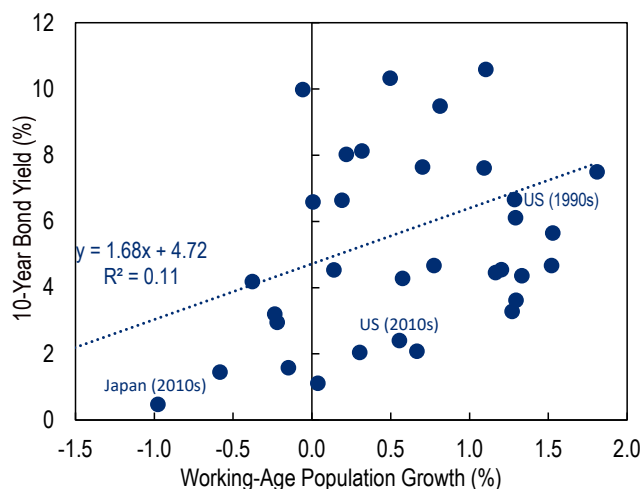
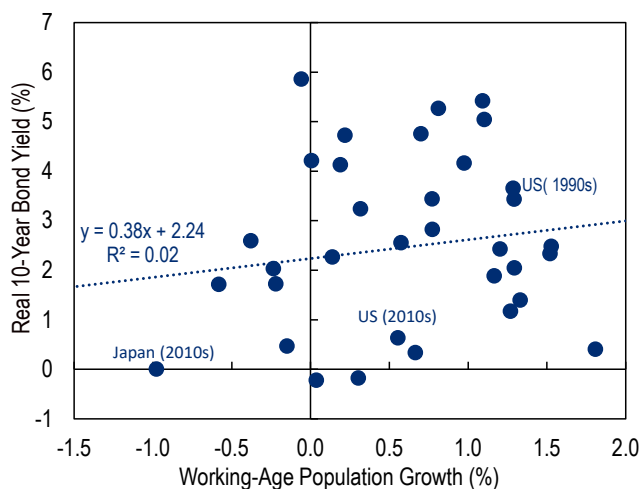


Figure 17. Working-Age Population and Real 10-year Bond Yields



Note: Decadal averages (60s, 70s, 80s, 90s, 00s, and 10s) for 10 Developed Market economies; two outliers are excluded.

Source: Citi Research, United Nations, National Statistical Sources, Haver

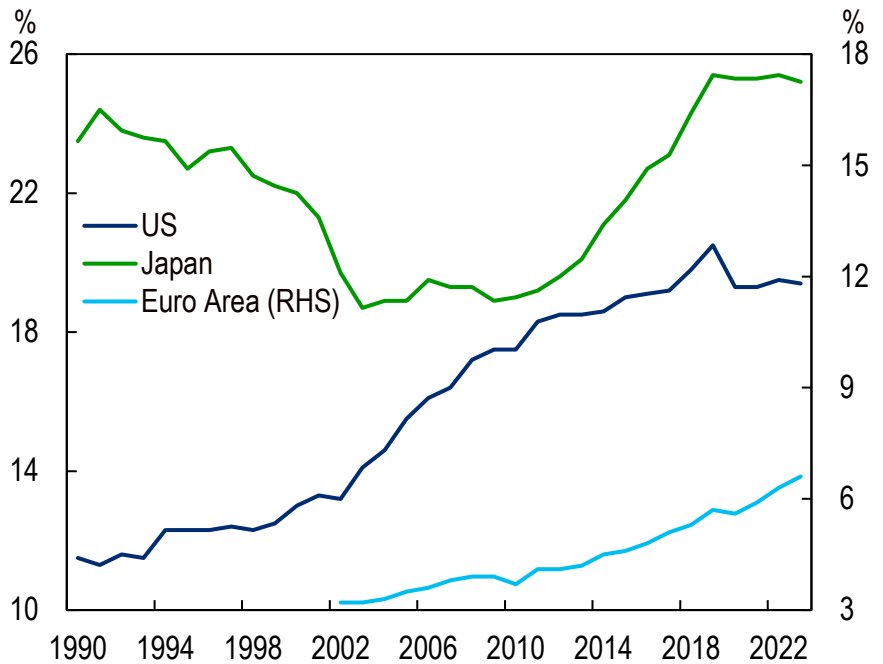
Source: Ibid

As the population ages and growth slows, risk assets are likely to feel downward pressure. To the extent that households are actively dis-saving (or de-risking) through retirement, the sales of assets would take a further bite out of prices for risk assets.

Nevertheless, it's also true that demographics are not necessarily destiny. While aging will no doubt influence outcomes for the economy and markets, there are ample mechanisms for the economy to adjust—or technology to innovate—in response to the challenges posed by demographics.

One simple mechanism is to better deploy the economy's existing labor resources. This could mean taking steps to keep older workers in the labor force, perhaps including pushing back the retirement age (Figure 18). Another possibility is offering flexible employment contracts for older workers, who may not be looking for a long-term employment relationship or a full 40-hour per week. Similarly, increased provision of childcare might expand the scope for younger households to supply labor.

Figure 18. Labor Force Participation Rate (65 Years Old and Above)



Source: BIS, Eurostat, MIC, Haver

Countries facing acute labor shortages can also open the door to additional immigration flows. This would allow workers to flow from parts of the world where labor is still relatively abundant. Of course, the economic rationale for immigration is broadly accepted, but the political debate in many countries is proportionately fierce.

Burgeoning AI and other technologies may also be a part of the solution. Historically, labor and capital have tended to be “complements” in production. Reduced growth of the labor force has also restrained investment, as the flow of new workers to “outfit” with capital has slowed. But AI technologies may yet evolve into full-blown “substitutes” for labor.

In this sense, the arrival of AI technologies may be well timed to offset the economic headwinds from demographics. The deeper question is whether AI (and eventually robotics) essentially “over solves” the problem. We’re left to ponder what jobs will remain for humans?

But similar questions have been raised by new technologies for generations and, inevitably, they create additional jobs and growing sources of demand. Even so, as AI technologies mature, their synergies with human workers — and the scope for new sources of employment — strike us as issues that will shape the economic realities of aging.

A Case Study on Japan



Katsuhiko Aiba
Japan Economist, Citi Research

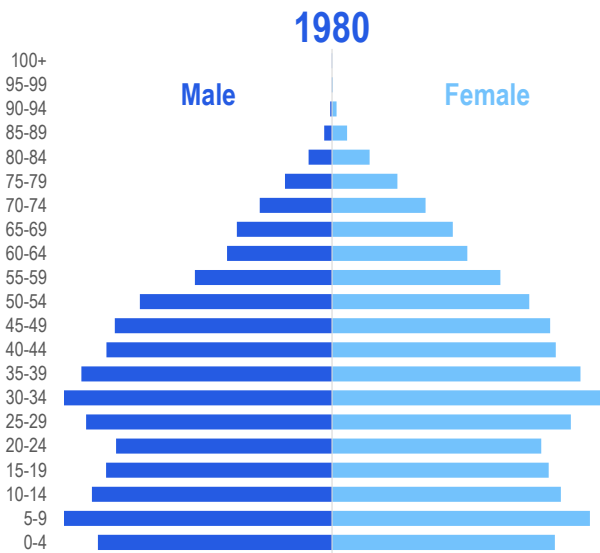
Katsuhiko Aiba is an Economist with Citi Research. Before joining the firm, he conducted research on economic theory at the Hebrew University of Jerusalem and the University of Bonn from 2011 to 2015. Prior to his career in academia, he was an economist at the Bank of Japan.

After the working-age population reached its peak in 1995, the total population in Japan began to decline in 2008 with the proportion of those aged +65 rising from 9.1% in 1980 to 28.6% in 2020. (Figure 19 and Figure 20) Accordingly, the average economic growth declined from +3.8% in 1980s to +0.4% in 2000s. Although it rebounded slightly in 2010s to +1.2%, the trend continued to decline, which is consistent with what economic growth theories suggest.

Aging has brought about changes not only on the supply side but also on the demand side. The number of housing starts in Japan decreased by 31% from 1980s to 2010s, and auto sales decreased by 4.4% in 2010s versus 1990s. Meanwhile, demand for healthcare service has increased with its share in GDP rising from 4.6% in 1994 to 8.6% in 2022.

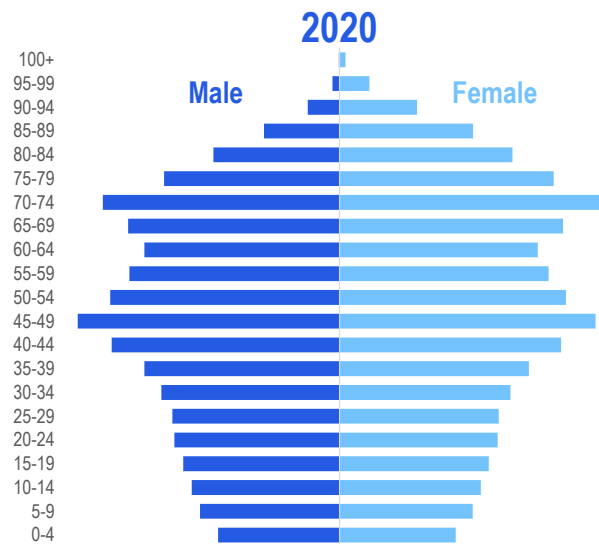
However, there were also forces offsetting the negative impact of aging. The growth rebound in 2010s was mainly possible by more labor participation from seniors (and females) amid the growing labor shortage. The government amended the law in 2012 to require firms to hire all wanting to continue to work up to the age of 65, while encouraging secure employment for people up to the age of 70. It also should not be dismissed that healthy life expectancy has increased. For instance, the mortality rate for 65-year-olds in 1970 is equivalent to that for 77-year-olds in 2016.²³ Since people are living longer and healthier, perhaps the social system should be designed according to biological age rather than chronological age.

Figure 19. Population Pyramid for Japan, 1980



Source: UN Population Prospects

Figure 20. Population Pyramid for Japan, 2020



Source: UN Population Prospects

²³ Sekine, T. (2019) "Does Demography Really Matter?" BoJ and MoF conference material.

Moreover, capital investment for labor-saving and digitalization has increased in response to labor shortages. For example, the proportion of software investment in capex rose from 7.0% in the 2000s to 11.0% in the 2020s. Recent theory suggests that if new technologies such as robots and AI are substitutes for labor, labor shortages will encourage automation, offsetting the negative impact of aging.²⁴ However, whether Japan becomes a model case for this theory will depend on the ability of the government and businesses to quickly reallocate resources. The government is encouraging re-education of workers through subsidies in order to make human resources adapt to new technologies.

Due to the labor shortage, the number of foreign workers has more than doubled in the past 10 years, but they only account for around 3% of the employed people, which is still far below U.S. and Europe. Although demand from firms is strong, large-scale immigration policies have not been adopted due to perceived resistance in public opinion. Additionally, the recent yen depreciation has made Japan less attractive as a workplace for immigrant workers. On the other hand, since 2000, the current account balance has generally maintained a surplus of around 2-4% of GDP, despite the narrative that drawing down in seniors' savings will lead to current account deficit. The reason behind this is that firms have diverted their production base overseas amid slower domestic growth. Furthermore, the aforementioned labor participation of females and seniors increased household savings.

The public system of pensions and health care in Japan is pay-as-you-go transferring from the young to the senior. For this reason, the government's social security expenditures have increased while insurance premiums and tax revenues have been sluggish due to the declining population, which has contributed to wider fiscal deficit with the public debt/GDP ratio rising from 48% in 1980 to 260% in 2022.

In the pension system, macroeconomic slide was introduced in 2004, where a certain amount is automatically deducted from annual pension benefits in light of declining working-age population and longer life expectancy. Although this has reduced the political risk of the pension system and made it more sustainable, it has had a negative impact on consumer sentiment as future benefits have been reduced. In addition, rising insurance premium for health care puts a strain on disposable income, and provides incentives for employers to hire non-regular employees as they must split the insurance premium burden with regular employees.

As many young people face sluggish income growth and unstable non-regular employment, their desire to get married and have children is rapidly declining. According to the Basic Survey on Fertility Trends, the percentage of unmarried people who have no intention of ever getting married rose from around 5% in 2002 to around 15% in 2021.

Additionally, the percentage of unmarried women who answered that they would continue working without having children as their expected life course increased from 21.0% in 2015 to 33.3% in 2021. Since 1994, the government has focused on creating an employment environment that allows people to balance work and childcare, but the birthrate has not shown any meaningful rebound. The government

²⁴ Acemoglu, D. and Restrepo, P. (2017) "Secular Stagnation? The Effect of Aging on Economic Growth in the Age of Automation" *American Economic Review*, Papers and Proceedings, and Acemoglu, D. and Restrepo, P. (2022) "Demographics and Automation" *Review of Economic Studies*

was slow to recognize the problem of the declining birthrate, and prioritized spending on the elderly rather than the young.

The new plan announced last year to combat the declining birthrate aims to raise wages structurally, and also includes measures to expand child allowances, reduce the burden of childbirth and education costs, and encourage males to take childcare leave. However, there is a growing sense of resignation among people that the measures are unlikely to change the trend unless Japan achieves the high economic growth seen in the past. Furthermore, in a society where diverse values are respected, it is difficult for the government to directly intervene in marriage and childbirth.

Finally, as the natural rate of interest declines, the Bank of Japan increasingly faced the zero lower bound on its policy rate, making it difficult to stimulate demand through monetary policy.²⁵ With limited room to lower policy rates, the Bank of Japan started targeting reserve balances in 2001, becoming the first in the world to rely on unconventional policies to expand its balance sheet, which have had side effects on the functioning of financial markets.

Furthermore, financial institutions' profits have declined due to population decline and lower interest rates with some banks having undergone mergers. It has been pointed out that the low interest rate environment increases banks' incentives to search for yields, which could lead to destabilization of the financial system.

There are, then, three things to be learned from the Japanese experience of population aging as the impact of this trend comes to be felt across most developed economies.

1. The transition to a population that is older than it ever has been demands a response rather than an attempt to reverse course as efforts to combat declining birth rates seem unlikely to shift current trends.
2. The population aging impacts many facets of the economy – including housing, healthcare, pensions, and the labor market.
3. Boosting the size of the workforce is a key component of responding to population aging, and it might involve supporting migration, inclusive workplaces, and longer working lives.

²⁵ Hansen, A. H. (1939) "Economic Progress and Declining Population Growth." *American Economic Review*, and Summers, Lawrence H. (2014) "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound." *Business Economics*

Chapter 2 – Minimizing the Dependence of an Older Population

Let us remind ourselves of the argument so far: population aging is an unstoppable trend with far-flung consequences that are complex and wide-ranging. Policies that attempt to reverse its course are at best futile and at worst undesirable. Hence population aging demands a response, not an attempt to reverse its course. This response will be as wide-ranging as the consequences themselves.

“There may be a lower proportion of individuals to pay taxes, work and provide care for those who need it.”
- UK Government Office for Science

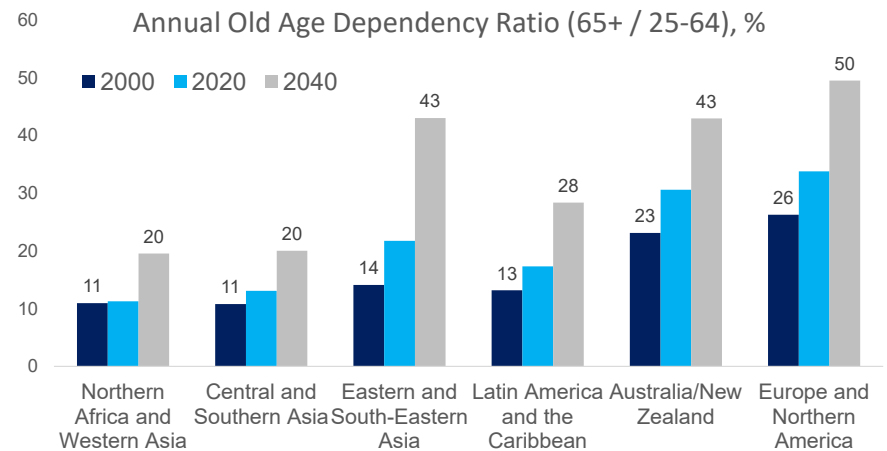
A fear that more public spending and more care work will be needed just as the workforce that supports these things begins to shrink emerges from both the reflections of Citi Research economists and a wider review of the literature as the most pressing economic consequence. For example, the UK Government report on the *Future of an Aging Population* highlights that *“one of the most important [implications of the demographic transition] is that there may be a lower proportion of individuals to pay taxes, work and provide care for those who need it.”*²⁶

The idea is that a larger older population will be dependent on a working-age population that is too small to support it – both economically and socially. This view says that an older population will impose two sorts of costs on a shrinking working-age population:

1. **Economic costs** in the form of higher spending on healthcare and social security.
2. **Social costs** as working-age adults are asked to provide more care for aging populations.

This fear is not unwarranted: measures of dependence like the Old Age Dependency Ratio (OADR) are projected to continue increasing. The metric presented in Figure 21 describes the size of the population aged over 65 as a share of the population aged 25-64, which the metric understands as the working-age population.

Figure 21. Old Age Dependency Rate (Age 65+ / 25-64), Selected Regions (%)



Source: UN Population Prospects

²⁶ Government Office for Science. 2016. *Future of an Aging Population*. Pp. 21. Accessible [here](#) [Last accessed March 25, 2024]

There were previously 4 people aged 25-64 for every over 65, decreasing to 2 by 2040.

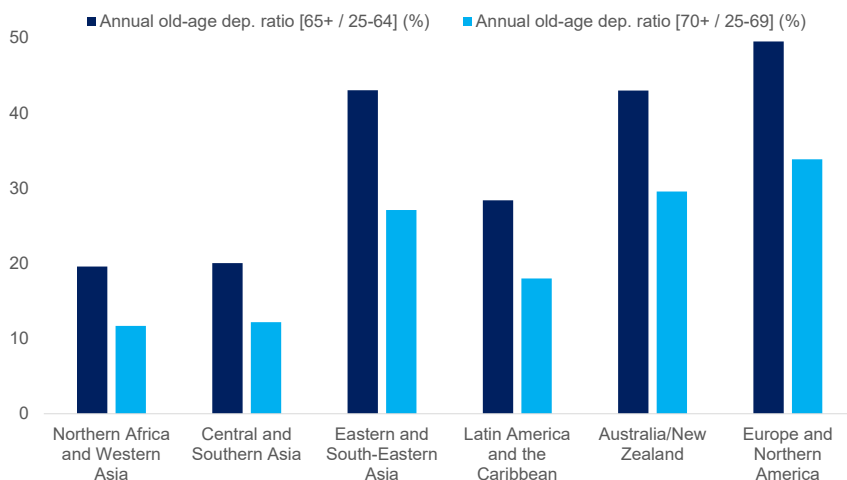
In many places this OADR has increased since 2000 and it is set to increase again between 2020 and 2040. This OADR is projected to reach 50% in Europe and North America, meaning that there were previously 4 people aged 25-64 for every over 65, decreasing to 2 by 2040 which purports to mark a significant increase in the level of dependence in the population.

However, it is reductive to assume that age 65 marks a shift from economic and social contributor to dependent (as this metric does). Over 65s often have far more than a decade to live and much of that time can be spent as an economic and social contributor. To put it simply – what it means to be 65 in the 21st century is different to what this meant in the 19th century, when the average life expectancy was less than 40 years on every continent.

Age 65 today is like age 54 in the 1970s.

Echoing this, the academic Jesus Crespo Cuaresma questions the idea that 65 marks an entry into “old age”, an exit from the labor force, and a sudden dependence on younger populations.²⁷ His analysis of South Korea suggests that age 65 today is like age 54 was in the 1970s. Traditional measures of OADR based on an assumed entry into old age at 65 risk overstating the scale of the demographic transition because it “does not account for variation in the actual dependency (financial or otherwise) of the older population in different countries”.²⁸

Figure 22. Varying the age of “dependence” curtails the demographic story



Source: UN Population Prospects

This ought to compel us to evolve our measures of dependence to reflect how life courses and experiences of aging are shifting.²⁹ In some dimensions in which life courses have evolved, this has already happened: a truly traditional metric would consider the number of over 65s as a share of the population aged 15-64. These ages assume that people enter the workforce at 16 and stay there until

²⁷ Cuaresma, J. C. ‘Rethinking Aging Societies: Growing young as you get old.’

Accessible [here](#)

²⁸ Skirbekk et al. ‘The Health-Adjusted Dependency Ratio as a New Global Measure of the Burden of Aging,’ *Lancet Healthy Longevity* 3 (2021), pp. 332-38

²⁹ In the academic literature, this has prompted the rise of alternative metrics which are not grounded in chronological age. For example, see Warren Sanderson and Sergei Scherbov, ‘Remeasuring Aging’ *Science* (2010) Accessible [here and](#) The Stanford Center on Longevity, ‘The New Map of Life.’ Accessible [here](#) [Last accessed April 16th, 2024]

retiring at 65. But life plans already diverge from this and in Europe and North America, few people enter the workforce at 16.³⁰ A more helpful measure would also shift “older age” up beyond 65.

The onset of dependence is malleable.

Bringing metrics into line with reality will temper the demographic story, but it also tells us something about how to respond to population aging. Age 65 might once have marked a shift from economic and social contributor to dependent. The fact that this has changed already implies that the onset of dependence is malleable. It is in our collective gift to determine at what age we become economically or socially dependent. There is no reason to think that we cannot shift further upwards the age at which individuals become dependent. Indeed, anecdotes from countries such as Japan that are further into the transition tell us that the independence and contribution of older groups can be significant.³¹ Think of hundred-year-old swimmers or marathon runners well into their 80s.

Figure 22 illustrates the difference that increasing the age at which we consider someone “dependent” up from 65 to 70 could make. In Europe and North America, shifting those aged 65-69 into the workforce moves the OADR from 50% to less than 30%. The idea is not that 70 is the right age to consider someone dependent rather than 65, but that we ought to be open to shifting the age of dependence upwards – both in our metrics and in the world.

In short, while the trend towards a population that is older than it ever has been is intractable, the trend towards an increasingly dependent one need not be. The salient question about the consequences of the demographic transition is therefore -- how can we shift upwards the age at which we become economically or socially dependent on the younger population?

Figure 23. Levers to minimize the dependence of an aging population

	Supporting Economic Resilience	Addressing the Impact of Ill Health
Mimizing Dependence and Supporting Contribution	Facilitating longer working lives for all, by supporting workers and reimagining work.	Supporting healthy ageing, focusing on lower income communities to close health inequalities.
Preparing for Increased Dependency	Enabling wealth building, especially for lower income communities.	Ensuring access to high quality healthcare in later life.

Source: Citi GPS

We see two axes in which governments, businesses, financial institutions and civil society can unite to respond: 1) delaying the onset of dependence and 2) preparing for higher levels – and each applies across two domains: a) health and b) wealth. First, delaying the onset of dependence requires supporting economic resilience by enabling both wealth-building and continued access to the labor market. Second, it requires supporting healthy aging for all, including delivering health equity. (Figure 23) There are corresponding steps that can be taken in the domains of health and wealth to prepare for an increased level of old age dependency: enabling retirement planning and ensuring access to high quality healthcare for all. In what follows, we collate insights from experts at Citi and across our global network to explore what this requires in practice.

³⁰ Andrew J. Scott and Lynda Gratton, 2016. *The 100-Year Life: Living and Working in an Age of Longevity*

³¹ See, for example ‘What the Japanese can teach us about super-aging gracefully’ BBC News. Accessible [here](#) [Last accessed April 17th 2024]

The consequences of population aging will be wide ranging; the response demanded will be similarly expansive.

We began this chapter by observing that the consequences of population aging will be wide ranging; the response demanded will be similarly expansive. We here leave many pressing societal questions unanswered – like those that Nathan Sheets raises above: “*Do younger workers respond to these burdens by demanding that the government commence programs to meet their needs as well? Or do they instead demand austerity to limit the overall fiscal burden and tax rates?*” No single report can describe a complete response to this demographic transition – **we focus here on supporting the health and wealth of an aging population as the key levers of minimizing dependence.**

Chapter 3 – Perspectives on the Wealth of an Aging Population

“The over 65 population has grown rapidly over the past decade in the U.S. alone, resulting in an ever-increasing need for financial planning to ensure we can build ourselves sustainable financial futures over decades.”

- Gonzalo Luchetti, Citi Head of U.S. Personal Banking

Longer working lives are one way for older people to remain economic contributors.

Supporting economic resilience is the first element of a response to the demographic transition, and it comes in two parts:

1. **Supporting older groups to be economic contributors** boosts personal finances and improves wellbeing at the individual level as well as tempering the force that population aging has on the size and economic output of the workforce at the population level.
2. **Boosting financial inclusion and accounting for longevity in personal financial planning** supports personal economic resilience for individuals when they do leave the workforce and, by doing so, mitigates population-level economic impacts.

Take the first of these. **If longer lives are not to bring an unmanageable level of dependence on a shrinking work force, individuals will need to be economic contributors into their later years.** For many, this will mean working for longer or, in a more radical revision to the life course, spreading working years differently across our lives.

However, making an economic contribution need not only means staying in the workforce. In 1982, Robert Butler introduced the idea of “productive aging” which refers not only to working in the formal labor force but also to “*unpaid productivity, such as voluntary activity to benefit others, such as one’s family and community, and a variety of pursuits and activities aimed a life enrichment*”,³² including, for example, volunteering or caring for family. His concept is close to that of healthy aging that has been picked up by the World Health Organization.

Keeping older groups in the workforce is not the only way to unlock their economic contribution, then, but it is perhaps the easiest way to measure that contribution. We saw above the impact that shifting those aged 65-69 into the workforce can have on measures of dependence: projections of the Old Age Dependency Ratio shifted from 50% to 30% in Europe and North America in 2040. This works in two directions to support economic resilience at the population level: 1) it increases the size of the workforce just as fertility trends begin to shrink it and 2) remaining part of the workforce prevents individuals becoming economically dependent on the state or their own financial savings.

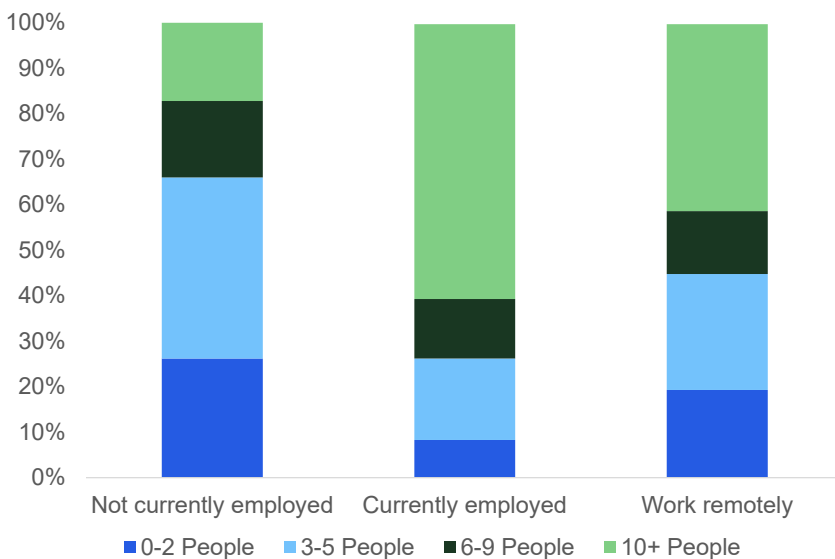
Moreover, although arguments have focused on economic resilience, there may also be non-economic reasons for supporting longer working lives. Work helps prevent loneliness: Tim Driver and Amanda Henshon note that “*in addition to reaping economic benefits from employment, [older workers] will be healthier for it, less isolated, and happier.*”³³ Figure 24 shows how remaining in work increases an individual’s social interactions, even if they work remotely. Research on India suggests that socialization and wide networks in old age play a role in supporting happiness in later life.³⁴

³² Iva Holmerova, Monica Ferreira and Petr Wija, 2012. *Productive Aging: Conditions and Opportunities*. pp.10

³³ Tim Driver and Amanda Henshon, ‘Working Longer Solves (Almost) Everything,’ in Olivia Mitchell (ed.) 2022. *New Models for Managing Longevity Risk: Public-Private Partnerships*

³⁴ Ronak Paul et al. ‘Differences in Life Satisfaction among Older Adults in India,’ *World Happiness Report 2024*

Figure 24. Number of social interactions per weekday, working vs. non-working older adults



Source: Driver and Henson, 2022. Retirementjobs.com and Age Friendly Foundation

The labor market will need to adapt to unlock the skills and experience that older workers can offer.

Increasing attachment to the labor market in later life cannot only be a matter of increasing retirement ages or requiring people to work for longer in physically or mentally demanding roles. The labor market will need to adapt to unlock the skills and experience that older workers can offer. Employers stand to benefit from this: research suggests that the costs associated with an older workforce are “either declining or non-existent”.³⁵

Research on the UK also highlights the macroeconomic benefit. The International Longevity Center found if the employment rate of those aged 50-64 matched that of those in their 30s and 40s, there could be an increase in UK GDP of up to 5%.³⁶ In the U.S., studies suggest that GDP could be boosted by 5% if 50- to 65-year-olds worked as much as 45- to 49-year-olds.³⁷ The same might be replicated elsewhere.

So – what can companies do to support longer working lives? Two key interventions emerge from the following expert contributions. Part of each is already underway: the demographic transition is not taking place in a vacuum.

- 1. Developments in technology** are already shifting the nature of work in a way that might sustain longer working lives, including by facilitating remote and hybrid work. As Professor Carl Frey notes, “*technological change [allowed] people to work longer by shifting the bulk of the workforce from farms to factories, to airconditioned offices*”. Technology operates in a

³⁵ Tim Driver and Amanda Henson, ‘Working Longer Solves (Almost) Everything,’ in Olivia Mitchell (ed.) 2022. *New Models for Managing Longevity Risk: Public-Private Partnerships*, pp. 79

³⁶ ILC. 2019. *The Missing Million: Illuminating the employment challenges of the over 50s*. Accessible [here](#) [Last accessed 8th April 2024]

³⁷ McKinsey, *Forward Thinking on how to live our longer lives with Andrew J. Scott*. Accessible [here](#)

second dimension: automation can prop up the productivity of a smaller workforce that demographic forces continue to shrink.

- 2. Continued development and training** are vital to lengthening working lives by ensuring that workers' skills remain fit for use over the longer term – especially in the context of an increasing use of technology. Experienced workers are also key to developing technologies for the workplace. Governments and businesses can both lead on this.



Rob Garlick
Head of Technology, Innovation, and the Future of Work
Citi Global Insights

Rob Garlick, Managing Director, is responsible for thematic content at Citi Global Insights, including digitization, innovation and the Future of Work. As Head of Citi Research EMEA from 2016- 2021, Rob led the team's rise in the Institutional Investor surveys, from: #7 to #1 in UK; #9 to #2 in Western European; #7 to #2 in CEEMEA; and #7 to #1 globally. Other industry awards included: #1 rank for ESG Research from both II and ESG Investing; Best ETF Research providers by ETF Express; and Best Innovation paper by Savvy Investor.

Deploying technology counters some demographic forces

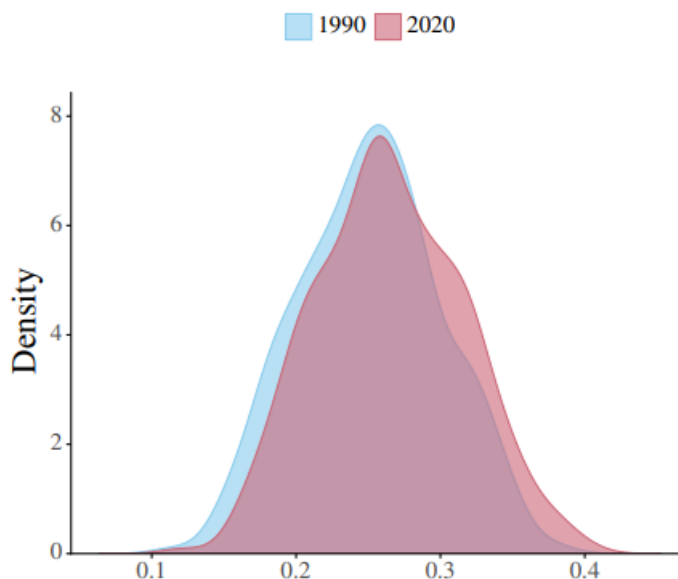
Technology is already changing the world of work in ways that might support longer working lives, but wider support is also required.

Technology facilitates longer working lives

First, technology is changing the structure of work – the pandemic opened up a new world of hybrid and remote work that is more attractive for older workers who want to work in a different way. Digital technology and connectivity underpin this trend and will continue to be progressive. Virtual and augmented reality will extend the ability to do jobs at distance, from equipment maintenance to surgery. Other older workers may be attracted by the autonomy, flexibility, and motivation of self-employment and technology has both reduced the costs and increased the reach of starting new businesses. There is more room for this trend to run.

Analysis shows that jobs have become more age-friendly over the last 30 years, with less physical work and more flexibility and autonomy.³⁸ (Figure 25) These trends will matter more as retirement ages extend and more leisure time is taken before retirement. Four-day weeks may become more common.

Figure 25. Distribution of a constructed "age-friendliness" index has shifted to the right



Source: Acemoglu et al 2022

Second, **technology might deliver better jobs**. One of the hopes of the AI age ahead is for AI to take on more of the burden of mundane tasks, freeing workers up to provide more meaningful and enjoyable value-added activities. If AI can augment roles this can lead to better jobs, more engagement, and older workers wanting to stay employed for longer.

Third, **technology can help to eliminate bias in recruitment processes**. Andy Haldane, Former Chief Economist at the Bank of England, has noted that "*the most important reason for low employment of older workers is endemic ageism*:"

³⁸ Daron Acemoglu et al. 'The Rise of Age-Friendly Jobs,' NBER Working Papers 30463 Accessible [here](#)

*discriminatory recruitment, retraining and business practices in companies, including around occupational health and job flexibility”.*³⁹ AI-based Talent Intelligence Platforms (TIPs) can improve internal talent mobility and the upskilling of employees, and it is possible for TIPs to exclude age as a factor.⁴⁰

Technology is not a total solution to ageism, though: only 63% of UN member states have national legislation and enforcement strategies against age-based discrimination,⁴¹ so there is room to go. Adding measurement and reporting of employee age profiles, hiring, and training can help. In Japan companies even have to offer new contracts to workers who reach retirement age so they can stay on, often with reduced pay, status, and workloads.

Finally, technology can help match workers with jobs in a more creative and flexible economy. In a recent MIH survey, 20% of older respondents said they wanted to work but were not doing, and not knowing where the jobs are was the most cited reason.⁴² Technology can help match talent with opportunities. Digital platforms are growing that allow job seekers to find work, from the gig economy to the creator economy, drop-servicing, digital nomads, or via volunteering sites.

Reskilling efforts are required to unlock this value from technology

Unlocking the potential of these technologies requires reskilling older workers. We estimate that two thirds of US jobs will be disrupted through a combination of AI, automation, and digital labor and while this is an opportunity to lengthen working lives, the needed adaptation will be more challenging for older workers. Older workers also tend to be less digitally literate than younger peers and some studies have shown that AI can boost the productivity of younger workers more than older workers. Older workers also tend to want to work fewer hours and it could be argued that the ROI of reskilling is lower for this cohort.

However, older workers have valuable knowledge and experience which can be used to teach AI systems. Humans-in-the-loop will also be the predominant next phase of AI. For instance, researching AI and Healthcare, Citi’s Adam Spielman concludes AI will support doctors and not replace them. ‘Experienced humans + AI’ will be the way forward so older workers will have an important part to play, including teaching AI. In the near term, older workers have valuable knowledge and experience which could teach both younger colleagues and AI systems.

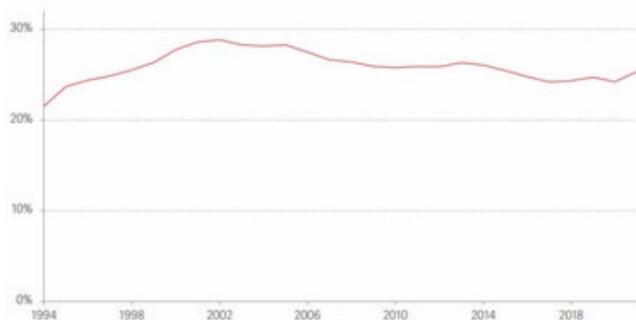
³⁹ ‘The Political Love-In with Business is Long Overdue’ Financial Times.

⁴⁰ For our recent reports in TIPs see here:

⁴¹ ‘UN Decade of Health Aging: Action Plan 2021-2030.’ Accessible [here](#)

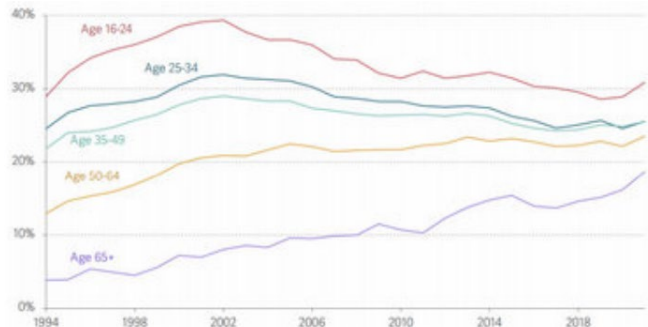
⁴² McKinsey, ‘Age is Just a Number: How older adults view healthy aging.’ May 2023. Accessible [here](#)

Figure 26. % UK Employees Receiving Work-Related Training in the Past Three Months, by Age



Source: The Economy 2030 Inquiry, LSE

Figure 27. % UK Employees Receiving Work-Related Training in the Past Three Months, by Age



Source: The Economy 2030 Inquiry, LSE

A key bridge towards an AI jobs Boom, rather than Doom, is reskilling. Figure 26 shows the share of UK workers receiving job-related training is stagnant. Corporate spending on Learning and Development has been falling for the last two decades. This needs to reverse, including incentives and possibly reporting to train older workers. Tax changes, tax credits, apprenticeships, micro-credentials, and life-long learning vouchers can all be part of the solution set. In addition to vouchers, Singapore offers up to 90% subsidies on reskilling programs for older workers, with strong success in improving their employment. Germany has a program called “Initiative 50 Plus” that provides training and lifelong learning to older people.

Career development conversations should go alongside this reskilling. In Britain, career advice for those aged 45-55 is around 20% of those aged 16-24. In contrast, one of the success factors behind Japan’s Silver Human Resource Center (SHRC) is providing advice and support to older job seekers. More than half a million older (>60) Japanese find work via this public-private SHRC.

Technology props up productivity of a shrinking workforce

Technology can also contribute to resisting the consequences of population aging in a second dimension – by propping up the productivity of a shrinking workforce.

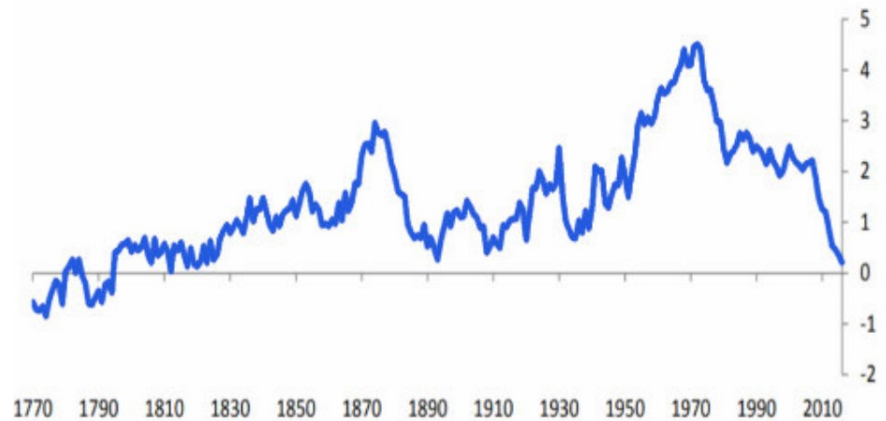
Productivity has been falling for the last two decades: Figure 28 illustrates the trend in the UK. While factors like Brexit exacerbate this trend, the same slowdown can be seen in most developed economies. An economic lifeboat is now capturing imaginations – AI. Generative AI is still early but a series of studies suggest it offers transformative productivity opportunities, from 50% in coding⁴³ to 37% in writing,⁴⁴ 14% in call centers and more.⁴⁵

⁴³ Github. ‘Quantifying Github Copilot’s Impact on Developers’ Productivity and Happiness’ September 2022. Accessible [here](#)

⁴⁴ Noy and Zhang, ‘Experimental evidence on the productivity effects of generative artificial intelligence,’ *Science* 381 (2023) Accessible [here](#)

⁴⁵ Brynjolfsson et al. ‘Generative AI at Work’ April 2023. Accessible [here](#)

Figure 28. UK Labor Productivity



Source: Bank of England, Office for National Statistics

There is also a significant derivative point this is not discussed enough. The productivity opportunities of a more positively engaged workforce are currently estimated to be double that from GenAI.⁴⁶ This does not need to be either or. We can have both, if worker anxiety about GenAI is used as a catalyst to have robust conversation and action on how to create better jobs. This was a key conclusion from our recent report '[AI Doom or Boom for Jobs.](#)'

But there are risks for inequality

However, almost all digitizing markets in the last 30 years have led to concentrating market shares due to economies of scale. This can exacerbate inequity and increase monopsony power over workers. Given AI thrives on data, the same could be true ahead unless AI anxiety leads to a tech-backlash. We may have seen the start of this in 2023 with the strikes in Hollywood. Humans can vote for the future they want.

There is however a different trend worth highlighting. Andy Haldane has argued that longer working lives could provide a "new endowment for the charitable sector". As well as providing meaning, societal contribution and social interaction, volunteering can help retraining. So, while technology could indeed extend inequality and hollow out the labor market, there is a positive opportunity to direct surplus hours towards improving human-to-human contribution.

⁴⁶ Clifton and Harter, 2023. *Culture Shock*



Professor Carl Frey
Associate Professor of AI and Work
Oxford Internet Institute

Professor Carl-Benedikt Frey is the Dieter Schwarz Associate Professor of AI & Work at the Oxford Internet Institute and a Fellow of Mansfield College, University of Oxford. He is also a Director of the Future of Work Programme and Oxford Martin Citi Fellow at the Oxford Martin School.

His most recent book, *The Technology Trap: Capital, Labor, and Power in the Age of Automation*, was selected a *Financial Times* Best Books of the Year in 2019.

Flexibility and Technology for Longer Working Lives: An Interview with Professor Carl Frey

Is technology a blessing or a curse for the demographic transition?

The long period of income stagnation that dominated nearly all of human history can be attributed to the so-called Malthusian trap, where any technological advancements that initially increase income levels lead to population expansions that eventually strain resources, causing living standards to revert to basic subsistence levels.

However, over time, population growth itself spurred technological advancement, as the increase in population size contributed to a greater number of inventors and a higher rate of successful technological innovations. As the pace of technological development picked up, societies reached a critical juncture where parents understood that their children needed education and skills to flourish, a realization that necessitated substantial investment in children's development and thus led to deliberate fertility control.

Consequently, population growth decoupled from technological progress, allowing for a significant rise in living standards. This is the essence of Oded Galor's "Unified Growth Theory", which highlights the role of technology in the demographic transition.

How might technology help older workers to stay in the labor force?

A broader impact of technological change has been to allow people to work longer by shifting the bulk of the workforce from farms to factories, to airconditioned offices.

Before electricity, for example, the multitude of belts, gears, and shafts were frequent culprits in factory mishaps, threatening the safety of workers' limbs and lives. The transition to individual electric motors did away with the hazardous tangle of mechanical parts and the related risks. Moreover, electric machinery produced less airborne dust, leading to cleaner air and healthier work environments. The replacement of gas lighting with electric illumination also contributed to better air quality by reducing humidity and eliminating harmful acid vapors. And automation further eased the physical demands of work.

As one factory worker at Henry Ford's River Rouge plant marveled in 1955, "Automation has saved me.... If I had to lug those heavy blocks into position like I used to I could not last till I was 65. Now I expect to be working till I am 80." His main concern was having put on thirty-three pounds since being aided by advanced machinery.

How might technology prop up the productivity of a shrinking workforce?

Technology can enhance the productivity of a shrinking workforce by promoting greater automation, particularly in response to an aging population that results in a scarcity of middle-aged workers who typically perform manual production tasks.

Indeed, empirical evidence suggest that as demographics shift towards older age profiles, countries and regions are more likely to adopt robots and other forms of automation. We see this across nations with varying rates of aging as well as across cities. Work by Daron Acemoglu and Pascual Restrepo, for example, shows that Innovation in automation is notably more intense in countries experiencing steady aging. Their research underlines that technological advancement,

particularly in automation, can counterbalance the effects of a diminishing workforce due to demographic changes.

What might be needed beyond technology to support an older workforce?

Supporting an older workforce requires a number of things that encompasses lifelong learning and training to keep skills updated, flexible working arrangements, and robust health plans for physical well-being. Ergonomic adjustments to the work environment are also essential to minimize strain, while anti-discrimination policies and training aim to foster an inclusive atmosphere that values experience over age.

What does technology mean for inequalities and the “hollowing out” of the labor market?

A decade ago, our study “The Future of Employment” was released, spotlighting the expansion of artificial intelligence (AI) capabilities and its implications for automating a wider range of tasks. At that time, the dominant belief was that we were moving past the era of the “average” worker, with automation increasingly taking over routine and administrative roles done by the middle class. This shift seemed to predominantly favor highly skilled professionals, who benefited from enhanced productivity through computer assistance and the global marketability of their skills.

However, ten years later, the advent of what’s now known as generative AI is challenging these notions. The advent of Copilot in software development, for example, has been a game-changer, significantly reducing project completion times. Interestingly, the greatest productivity gains have been seen not among seasoned programmers, but among those new to coding. And this is not an isolated example.

Similarly, ChatGPT has notably improved efficiency in writing tasks, particularly for individuals with weaker writing skills. Moreover, in customer service, research by Erik Brynjolfsson and colleagues demonstrates that AI assistants enhance productivity by automating mundane tasks and aiding human agents, with novices and those with less skill deriving the most benefit in terms of productivity. These developments are overturning the traditional view that automation primarily advantages highly skilled workers, suggesting instead that technology can level the playing field in content-driven sectors like legal, education, news, and entertainment.

However, this democratization of access also implies more competition and potentially lower earnings for those already established in these fields. The situation mirrors the impact of Uber on the taxi industry. With GPS technology, intimate knowledge of city streets became less critical, allowing drivers unfamiliar with their cities to succeed. This increased competition led to lower earnings for traditional taxi drivers. My own work with Thor Berger and Chinchih Chen reveals that Uber’s entry into a new city typically resulted in a 10% decrease in hourly earnings for drivers.

Supporting longer working lives requires more than the technology revolution that is underway: it requires flexibility like part-time and hybrid work schedules, opportunities for phased retirement and ending ageism – which the World Health Organization defines as “[using] age to categorize and divide people in ways that lead to harm, disadvantage and injustice and erode solidarity across generations”.⁴⁷ Policy plays some role, but employers must also support evolving the labor market to facilitate longer working lives and in many cases, they can lead.

One in three report having experienced some sort of ageism in Europe.

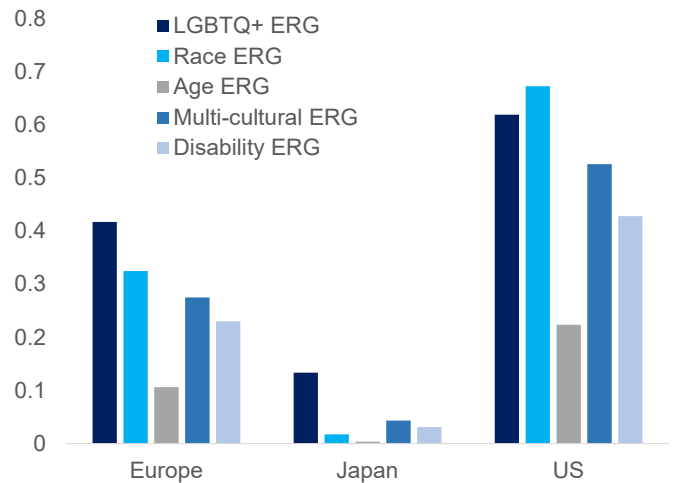
One way to address this is for diversity and inclusion initiatives to include older workers and to balance the competing demands of a multi-generational workforce. Research suggests that older people experience ageism both at work and elsewhere, which curtails their income and makes them more likely to retire early.⁴⁸ 1 in 3 report having experienced some sort of ageism in Europe. Yet, data from a survey of UK-based companies shows that age lags other aspects of diversity in terms of the actions being taken by leaders. (Figure 29) Moreover, age-related Employee Resource Groups (ERGs) lag ERGs on other aspects of diversity, like gender and race. (Figure 30)

Figure 29. UK companies are less likely to report that action is being taken on age-related inclusion



Source: Chartered Management Institute

Figure 30. Across Europe, Japan and the U.S., age-related employee resource groups are less common than other diversity characteristics



Source: Denominator

Given the economic benefits that could be derived from boosting the supply of older workers, there is reason for employers to support longer working lives. To explore what a diversity and inclusion strategy for older workers could look like, we turn to the expertise of Citi’s Chief Diversity, Equity and Inclusion Officer, Erika Irish Brown. Like Professor Carl Frey and Rob Garlick, she highlights the importance of flexibility and, pointing towards the second half of this chapter, the need to support healthy aging and health at work to allow workers to extend the duration of their careers.

⁴⁷ WHO, 2021. *Global Report on Ageism*. Accessible [here](#) [Last accessed 3rd April 2024]

⁴⁸ WHO, 2021. *Global Report on Ageism*. Accessible [here](#) [Last accessed 3rd April 2024]



Erika Irish Brown
Chief Diversity, Equity and Inclusion
Officer and Head of Talent
Citi

Erika Irish Brown is Citi's Chief Diversity, Equity and Inclusion Officer and Head of Talent, responsible for developing global diversity, equity and inclusion strategy and driving Citi's agenda on talent planning, succession planning and leadership development.

Before joining Citi, Erika was Chief Diversity Officer at Goldman Sachs from 2018 to 2021 and Global Head of Diversity and Inclusion at Bloomberg from 2015 to 2018. Prior to this, she led executive and diversity hiring efforts at Bank of America and Lehman Brothers.

Beyond Technology: An Interview with Erika Irish Brown

How can employers support older workers to remain at work for longer?

There is immense value in a multigenerational workforce. Earlier generations – such as Baby Boomers – bring a wealth of experience and historical knowledge that add value to any workplace. We take a holistic approach to supporting the well-being of colleagues of any generation and encourage other employers to do the same.

One way to support is through inclusive healthcare benefits, including virtual telehealth options. At Citi, we offer mental health resources such as manager training and free counseling, in all our geographies, and many of our largest locations feature onsite medical clinics, fitness centers and annual health screenings. In addition, we have leave policies that provide the opportunity to recharge or step away from work, which we believe can boost job productivity and morale. Another method is offering colleagues flexibility in how they work. We remain committed to our hybrid work model which gives colleagues the flexibility to work at least three days per week in the office and up to two days per week remotely. This supports better work-life integration while realizing the advantages of being together in person.

A third recommendation is to build community through Employee Resource Groups. Our "Inclusion Networks" enable executive leaders to partner with colleagues to build an organization that understands, appreciates, and leverages the unique perspectives of our global workforce. We provide multigenerational colleagues with localized networking, mentoring and career development programming, supporting talent of all tenures and levels in the workforce.

How can employers manage a multigenerational workforce?

Fostering a culture of inclusivity and belonging is key. At Citi, transparency and accountability are key to our success as a diverse, equitable and inclusive company. Every generation brings unique skills, perspectives, and experiences to the table, and as employers, it is up to us to ensure our colleagues understand the benefits of a multigenerational workforce. How we communicate and collaborate, what programming and benefits we offer, and how we promote this intergenerational knowledge exchange are all key components to delivering for our colleagues.

Leaders and managers play a crucial role in fostering an inclusive environment where every team member feels valued and empowered to contribute. By recognizing the strengths of different generations, leaders can cultivate high-performing teams that capitalize on a range of skills and perspectives. Encouraging mentoring and apprenticeship programs facilitates the exchange of knowledge between generations, ensuring that valuable expertise is shared while also fostering a culture of continuous learning and development. Additionally, creating a psychologically safe space where all employees feel comfortable proposing ideas encourages innovation and collaboration across generational lines.

Ultimately, leaders and managers serve as culture carriers, guiding their teams towards embracing diversity and leveraging it as a competitive advantage in today's dynamic workplace landscape. By embracing diversity and leveraging the strengths of each generation, employers can create a dynamic and innovative workplace where every employee can contribute and grow, ultimately leading to increased productivity, employee satisfaction and organizational success.

How can employers support colleagues with care-giving responsibilities?

As our workers enter new stages of life, they often have new work, family, and caregiving responsibilities. At Citi, we celebrate the important role families play for our colleagues as well as recognize the joys and challenges of integrating workplace responsibilities as a parent, child, grandparent, or caregiver.

Employers can support colleagues with family or caregiving responsibilities by implementing flexible work arrangements to accommodate their personal duties while maintaining productivity. Offering inclusive paid family leave and caregiving benefits can provide employees with the time and financial support to attend to their responsibilities without worrying about job security or financial strain. Providing access to caregiving support services, such as legal support, eldercare assistance programs or childcare assistance, can alleviate the stress and burden on employees integrating work and caregiving responsibilities.

We also recommend building community through Employee Resource Groups, like our Families Matter Inclusion Networks. Recognition, appreciation, and opportunities for career advancement can foster loyalty and engagement among employees with caregiving responsibilities. By prioritizing the well-being and needs of employees with caregiving responsibilities, employers can cultivate a compassionate and inclusive workplace that promotes work-life integration and supports the needs of an aging workforce.

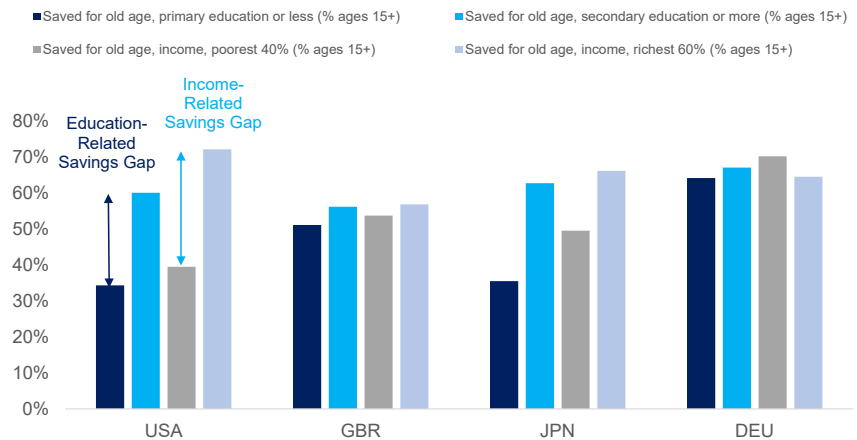
The share of the adult population that report saving for old age each year is far from 100%, even in the most economically inclusive societies

Staying attached to the labor market for longer is one thing, but it is unlikely that anyone will either choose or be able to work for their entire life. At some point, retirement and savings will need to come into play – even if the 20th century notion of retiring at a certain age “to the golf course or a rocking chair”, as Chuck Cavanaugh, Head of Financial Planning at Citi Personal Wealth Management, puts it in his interview, is revolutionized. This is the second pillar of supporting economic resilience that we set out at the beginning of this chapter: evolving financial planning and boosting inclusion to support economic independence into older age.

There are concerns about the economic resilience of future retirees because the share of the adult population that report saving for old age each year is far from 100% even in the most economically inclusive societies. For example, Sweden had the highest share of workers saving for old age in 2021 but even there more than 20% of the adult population reported not saving for old age.⁴⁹ Likewise, we drew attention to Japan earlier as a country that is well advanced in its transition: even here, over a third of adults in the workforce did not save for their old age in 2021.

Automatic enrolment, which sees employees automatically enrolled in pension schemes unless they opt out, is one policy tool that can boost the share of people saving for retirement.⁵⁰ These policies have spread across developed economies in the last two decades and have boosted the share of the population saving for retirement, but questions about saving enough for a *longer* retirement remain.

Figure 31. Inequalities in rate of saving for old age



Source: World Bank, Global FIndex Database (2021)

Moreover, financial preparation for retirement is in some places inflected along the lines of traditional inequalities. Figure 31 shows that in some countries there are inequalities in savings rates by education and income level. This ignores questions about how much each group is saving and only considers whether they saved for old age in the year 2021-22 or not.

For example, in the U.S., 60% of those who had completed secondary education or more saved for old age vs. 34% of those who had not. Likewise, of those in the richest 60% by income, 72% saved for retirement vs. 40% in the lowest earning 40% of the population. The same trend shows up in other places (albeit to a lesser

⁴⁹ World Bank, *The Global Findex Database 2021*

⁵⁰ European Commission, ‘Best practices and performance of auto-enrolment mechanisms for pension savings: Final Report’ November 2021. Accessible [here](#) [Last accessed April 16th, 2024]

Gap in life expectancy between the richest 1% and poorest 1% runs to 15 years for men and 10 years for women

extent) like in the UK and Japan, but it is not a global trend as Germany shows in Figure 31.

Health inequalities and the sorts of job that those with fewer years of education or lower incomes tend to have compound difficulties in saving to produce stark inequalities. Evidence suggests that there is a gap in life expectancy between the richest 1% and poorest 1% which runs to 15 years for men and 10 years for women.⁵¹ Likewise, socio-economic status is a risk factor for many chronic diseases which have a bearing on capacity to work into later life.⁵² Those with less education or lower incomes therefore stand to live for fewer years and to be in worse health.

Those with worse health are also less likely to be economically resilient in later life because they are less likely to have saved for retirement – even before we ask whether they have adequate savings. In other words, those who most need to retire due to ill health are less likely to be able to.

Moreover, some evidence suggests that it is not universally true that there are non-economic benefits associated with longer working lives: the benefits of remaining in work “are most likely to be for males, those reducing to part-time working, and those employees who are in jobs which are not low quality or low reward”.⁵³ The need to continue working for financial reasons is instead potentially negative for health outcomes, rather than underlining the economic reasons to stay in the labor market. This is a significant economic concern: if some are unable to retire on their own economic resources and are unable to continue working due to ill health or increase their ill health by attempting to remain in the work force, they will become economically dependent – whether on social security or on family members.

Financial planning, then, remains a key support to economic resilience in the context of longevity and there is a need to expand access to it. We turn here to one of Citi’s experts on financial planning for U.S. individuals, Chuck Cavanaugh, Head of Financial Planning at Citi Personal Wealth Management, who explains how financial plans must evolve to account for increased life expectancy. Approaches to retirement saving and social security in later life vary globally, and the insights that follow arise from the U.S. context.

⁵¹ World Economic Forum. 2020. Global Social Mobility Index: why economic benefit from fixing inequality. Accessible [here](#) [Last accessed April 9th, 2024]

⁵² For example, on diabetes: Kyrou et al. 2020. “Low socioeconomic status can significantly increase the risk for prediabetes and T2DM, but is often overlooked.” Accessible [here](#) And on cardiovascular disease: Schultz et al. 2018. “SES has a measurable and significant impact on cardiovascular health. Individuals of low SES carry a substantial burden of CVD and are more likely to experience increased event rates and poorer outcomes.” Accessible [here](#) [Last accessed April 9th, 2024]

⁵³ Susan Baxter et al. ‘Is working in later life good for your health? A systematic review of health outcomes resulting from extended working lives,’ *BMC Public Health* (2021)



Chuck Cavanaugh
Head of Financial Planning
Citi Personal Wealth Management

Chuck is the Head of Financial Planning for Citi U.S. Consumer Wealth Management, where he is responsible for leading the financial planning team. The team works with clients to develop and implement financial plans, including estate & trust planning, charitable giving, intergenerational planning, business succession, secured retirement income, risk mitigation and wealth protection.

With over 30 years of experience, Chuck is a seasoned wealth management strategist who has spent most of his career supporting wealth advisors in helping clients achieve their financial goals. He has also been a guest speaker throughout the United States on retirement income strategies, financial planning, and estate planning.

Financial Planning for Longevity: An Interview with Chuck Cavanaugh, Head of Financial Planning, Citi Personal Wealth Management

What are the economic costs to the individual associated with aging?

One of the most important costs to consider is healthcare: older individuals require more medications, visits to the doctor, and unfortunately hospitalizations. They often have increased medical expenses and the health insurance industry is adjusting in response, resulting in higher deductibles and higher premiums. All of this can significantly strain individual budgets, especially for those with lower or medium incomes. Related to this are long-term care expenses for support with the activities of daily living. This is very expensive; it can quickly deplete personal savings and retirement funds. Modifying housing – like installing ramps for wheelchairs or grab bars in bathrooms– also has a cost attached. Transport costs also change, like needing to take a taxi home because older individuals might not be comfortable driving at night.

At the same time older individuals often see a significant decrease in income. When we create financial plans, we're trying to keep people at a standard of living that they're comfortable with but often it is very difficult because they have much less money coming in. We talk about saving earlier, saving more, and retiring later because we do see people retiring with an income that will not sustain even a facsimile of their prior standard of living. Some people think they will just work for longer, but ill health often gets in the way. Even when it doesn't, age discrimination is still prevalent: it's still difficult for older individuals to find or keep employment. Those who have planned and those who are in better health will be better prepared.

Are current generations prepared for their financial needs in later life?

The situation is different for each generation. The Baby Boomers were working during a fairly strong economy which allowed them to accumulate wealth and buy their own homes. They also had access to a robust social security program in the early stages of their retirement and some had the benefit of pensions. They are now in retirement and are dealing with rising healthcare costs and the potential demise of social security in its current form which they probably did not plan for because it's a relatively new phenomenon.

Gen X witnessed some of the financial challenges on Baby Boomers experienced, so they have more awareness of the need for a financial plan. But many entered the workforce during a recessionary period which impacted their earning potential and retirement savings. This was also one of the first generations to have student loan debt and some of them still have it because they couldn't pay it off. Millennials had more access to financial planning resources than other generations, but they still have the challenge of student loan debt. They're also dealing with rising costs of living and many of them entered the workforce during the Great Recession which has impacted their ability to accumulate wealth in the early years of their career. Gen Z are planning their finances earlier than other generations – time will tell how they fare financially over the course of their careers.

How does financial planning need to change for longer lives?

One of the biggest challenges is longer retirements. Because people are living longer than before, retirement savings need to last for a longer period of time. It's possible that you might be retired for 30 years and that might be the same amount of time that you were working. The model used to be that at a certain age you would retire to the golf course or a rocking chair. This will not be sustainable for most

people. Expectations will need to shift toward working longer, working part-time or freelancing and phasing into retirement gradually.

Even if these expectations do shift, planning will still have to factor in the possibility of people being retired for longer. This will necessitate conversations about saving more and saving earlier which can be challenging when young people want a standard of living similar to what their parents had – that allows them to buy a home and have children. Investment strategies will need to shift. Generally, you have a more aggressive strategy while you're younger and when you get older, you shift into more fixed income because it's more secure. Longer lives mean staying somewhat invested in equities for longer to keep up with inflation and balancing a growth-oriented portfolio with income generating assets like bonds. Risk tolerance in later life will need to be revised upwards to drive this.

This complexity in financial planning for longer lives really requires a professional. They can also do what-if scenarios in the planning process, to explore what happens if social security falls to only 80% of what it is now, or you need medical assistance and long-term care. Everyone should have not only a financial plan but a financial professional to coach them on the complexities of longer lives.

What wider support is needed to support effective financial planning for a longer life?

The first piece is education. In some places financial literacy is taught in school. You shouldn't be learning about that in your thirties because by then you have already missed a decade of potential earning time. But public awareness campaigns must be balanced: if scare tactics are used, some people can't handle reality and as the idiom goes, "bury their heads in the sand." Governments play a role in supporting awareness or expanding incentives to save for retirement especially for lower- and middle-income groups.

Another area is in long-term care insurance. 20 years ago, there were over one hundred companies in the U.S. providing long-term care insurance. Now, I think that number will be in the dozens. Products weren't priced correctly and so some insurance companies couldn't sustain their unprofitable long-term care insurance portfolios. But exploring tax advantaged accounts that cover long term care expenses or building more public-private sector partnerships that provide a degree of asset protection against long-term care expenses would be helpful.

There will always be a role for social security. It provides financial protection for retirement, disability, and survivor & family benefits. We need to improve its sustainability by implementing gradual adjustments, like raising the retirement age or modifying the benefits it offers. This requires transparency to make sure public expectations match what social security will offer. For example, if people are expecting to live solely on social security benefits in retirement, they need to be made aware that these benefits may be reduced in the future. There is also more to be done on workplace flexibility to encourage employers to hire older workers – this isn't only economically important; staying in work can have a positive psychological impact.

As financial planning evolves to account for higher life expectancies, the investment management industry stands to be impacted. The industry has already responded to managing the shift in members and assets arising from the shift from Defined Benefit (DB) to Defined Contribution (DC) plans. Our Business Advisory Services colleagues set out five scenarios for these decumulating DB plans in their 2023 TrendWatch report, [How Investors' Demand for Scale and Transparency Could Re-Shape Investment Management](#). Adnan Memon highlights in his contribution to this report that the impact of population aging might evolve in three dimensions:

1. **Increasing demand for customization** of investment products to reflect heterogeneous experiences of aging and retirement.
2. **Changing demands on pension funds** from consumers and perhaps regulators as products come closer to retail investment products by targeting individuals.
3. **Stickier relationships between retiree and investment manager** as retirement becomes more flexible and financing needs evolve around a multi-stage career of phased retirement.

Adnan Memon
Business Advisory Services
Citi Global Insights

Shifting retirement patterns stand to impact the investment management industry

Why might the status quo be disrupted by existing trends?

As Defined Benefit (DB) pension plans distribute their assets to the retirees, there are fewer large institutional pools of capital remaining for the industry, so the industry becomes more linked to the needs of individual investors.

The drive for transparency and consolidation of assets may increase in the coming years – and pensions may not be immune. In the UK, the government's progress towards launching a mandatory Pensions Dashboard could make it easier for individuals to compare fund performance across one's pension portfolio in a single place, regardless of whether the funds are from workplace or private pension savings. In theory, this development isn't entirely novel, with commercial aggregators and dashboards already available, but the attention it is gaining right now is changing the likelihood of adoption and so the consideration of risk and return on a portfolio basis, rather than on a fund basis. The logical next step would be to pool other savings into that same dashboard so that assets and risks can be assessed more holistically – which we discuss in greater depth in [our recent TrendWatch paper](#).

The growth of multi-asset class solutions globally and retail separate accounts in the U.S. in particular (and also to a lesser extent elsewhere) are some of the manifestations of this drive to customization. That process is underway but still has a long way to go. The main limitation is the data on the future retirees, but some firms are taking steps to address this gap.

How might the demographic transition combine and accelerate these trends?

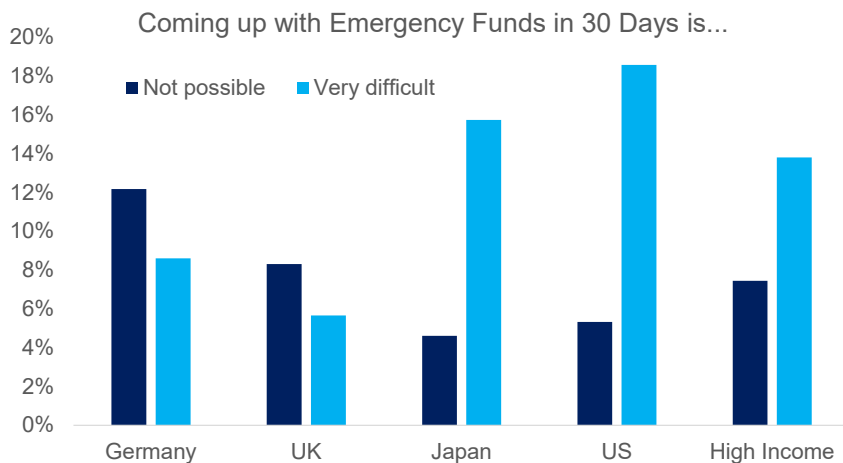
Portfolios are becoming more customized and, as explained above, are likely to become even more so. Pension dashboards could highlight the shortcomings of existing approaches to targeting a return linked to government bonds instead of generating the maximum possible risk-adjusted retirement income. If those assets need to last thirty years rather than ten, we could potentially apply much of the

same financial models as were used to build those assets up over the previous thirty years, but without the, now unnecessary, desire to divert assets from equities to bonds upon retirement.

From a product perspective, asset managers may evolve their offerings further to help retirees with their financial needs. In many cases, the goal has been to get people to retirement and then to hand them off to retirement specialists who can offer annuities. That may have worked previously and could continue to serve many well, but with the increasing longevity pressures on those pools of assets, we may no longer treat retirement as a binary moment that switches from savings to retirement income. Instead, we could see ongoing management of those assets linked to investor needs and goals and, in doing so, create stickier relationships between retirees and their investment management partners.

It merits noting that some face challenges to saving anything. Across OECD-11 countries, more than 60% of adults say that they have a financial cushion to last them no more than six months.⁵⁴ Figure 32 shows that a significant share of the population even in High Income Countries face challenges to coming up with emergency funds in 30 days if they needed them. These figures are from 2021, i.e., before post-pandemic inflation impacted personal finances in many places.

Figure 32. Share of the population facing difficulties finding emergency funds in 30 days



Source: World Bank, Global Findex Database (2021)

Low pay and barriers to wealth accumulation are additional risks to economic resilience in later life

Economic resilience is therefore not only about access to the tools of financial planning: **low pay and barriers to wealth accumulation are additional risks to economic resilience in later life.** Some studies of the U.S. suggest that millennials (born between the early 1980s and late 1990s) are earning less than their parents' generation did and that their level of asset accumulation and home ownership is both lower⁵⁵ and beset with risks.⁵⁶ This has consequences for future generations of retirees, which will not be solved by financial planning.

⁵⁴ World Economic Forum, 2024. *Longevity Economy Principles: The Foundation for a Financially Resilient Future*, pp. 7. OECD-11 countries included in their analysis are: Austria, Colombia, Czech Republic, Estonia, Germany, Hungary, Italy, Korea, Poland, Portugal and Slovenia.

⁵⁵ Young Invincibles, 2017. *Financial Health of Young America: Measuring Generational Declines between Baby Boomers and Millennials*

⁵⁶ For discussion, see: Gale, W.G. et al. 2019. 'How Will Retirement Saving Change by 2050? Prospects for the Millennial Generation' Brookings Institution.

Key Actions for Supporting Economic Resilience

The first lever to minimize the level of economic and social dependence that an aging population imposes is to support economic resilience. In this chapter, we have set out two aspects:

1. **Maximize the economic contribution of older groups by supporting longer working lives** through the adoption of technology, inclusion efforts, and labor market flexibility.
2. **Support economic self-reliance in later life through financial inclusion**, including access to the tools of financial planning and wealth accumulation.

Both aspects minimize the dependence in the population. The first delays the effects of aging at the individual level, by redefining what it means to be a particular chronological age in terms of attachment to the labor market. The second takes seriously the consequences of population aging, that there will be an increased number of people relying on their retirement savings and asks how economic resilience can be boosted in that context. These are not incompatible; they work in tandem to first reduce the impact of chronological population aging and then respond to its effects.

For now, these are high-level principles for a response to population aging. In the Conclusion, together with the Global Coalition on Aging, we highlight concrete examples of how private sector actors can contribute to each of these principles.

Chapter 4 – Perspectives on the Health of an Aging Population

In the previous chapter, we explored how we might collectively reimagine work to facilitate longer working lives. An unanswered question lurks behind this discussion: will today’s older population, and indeed tomorrow’s, be healthy enough to extend their working lives as far as they might need?⁵⁷

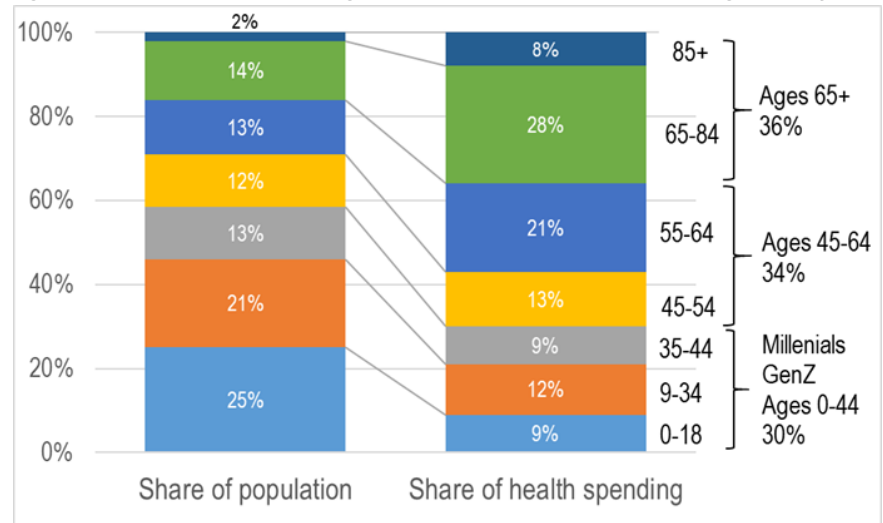
Health is the second dimension in which the level of dependence in an aging population must be minimized. It is relevant to this discussion beyond being a precondition of longer working lives. First, maximizing healthy life expectancy is valuable on a human level: increased life expectancy will be of little value to individuals if they are not able to enjoy those years.

Second, part of the economic worry surrounding the demographic transition is the concern that healthcare costs will spiral out of control as the older population grows. Indeed, a report on public spending among EU member states finds that the total cost of aging⁵⁸ in 2019 stood at 24% of GDP, and this is forecast to rise by 1.9 pts by 2070 driven primarily by increases in long-term care and healthcare spending.⁵⁹

Over 65s account for an outsize share of medical spending compared with their share of the population

The thesis is that over 65s account for an outsize share of medical spending compared with their share of the population (Figure 33), so an increasing number of over 65s in the global population will drive up healthcare-related spending at the population level.

Figure 33. Over 65s account for a higher share of healthcare related spending, U.S. only



Source: KFF analysis of 2021 Medical Expenditure Panel Survey data

Responding to the demographic transition in this dimension requires two things:

⁵⁷ For discussion of this objection to lengthening working lives, see: Scott, A. J. ‘The Longevity Economy,’ *Lancet Healthy Longevity* (2021), pp. 828-835

⁵⁸ This includes pensions (the costs of which are projected to decline on account of prior policy reforms), healthcare, long-term care and education.

⁵⁹ European Commission, *The 2021 Aging Report: Economic and Budgetary Projections for EU Member States (2019-2070)*, pp. 7-8

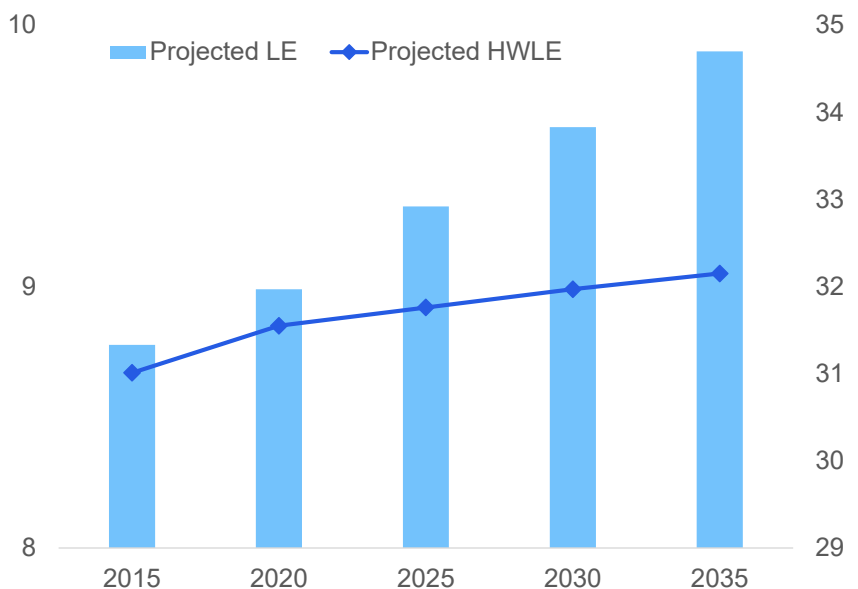
We do not live all our additional years in good health

1. **Supporting healthy aging** or minimizing the level of ill health in the population as it ages and maximizing the years of additional life expectancy that are lived in good health.
2. **Strengthening and innovating the provision of healthcare and long-term care** to ensure access to high quality care for all in later life.

Begin with the first of those. There is some evidence that gains in healthy life expectancy have not kept pace with gains in life expectancy: in other words, although we live for longer, we do not live all our additional years in good health. A systematic review of international trends in health expectancies between 1970 and 2017 revealed that *"in most countries, gains in healthy and disability-free life expectancy do not match the growth in total life expectancy"*.⁶⁰

A more recent study of the UK quantified expected gains in life expectancy and healthy-working-life-expectancy, defined as the number of years individuals are expected to spend in good health and in paid employment after age 50, between 2015 and 2035. Over this period, life expectancy at age 50 was projected to increase by 0.2 years and 0.12 years per calendar year for men and women respectively. The years spent in good health and paid work was expected to increase substantially less, at 0.02 years for men and 0.05 years for women per calendar year. In other words, we can expect to spend our additional years of life expectancy in ill health and out of the work force.

Figure 34. Gains in healthy working life expectancy fail to keep pace with gains in life expectancy



Note: Data is for men. A similar trend, but with less levelling off in HWLE, can be seen for women.

Source: Lynch et al. 2022

We have an opportunity to improve how healthy our older population can be

But the health of tomorrow's aging population is not immutable. Just as it is in our gift to increase economic resilience, for example by lengthening working lives, so we have an opportunity to improve how healthy our older population can be. The idea that age 65 marks a threshold at which one requires more healthcare spending

⁶⁰ Gemma Spiers et al. 'Trends in health expectancies: a systematic review of international evidence,' *BMJ Open* 11 (2021), doi:10.1136/bmjopen-2020-045567

can be both questioned in theory and altered in practice. The first salient question is, then, **what is needed to support healthy aging?**

We again collate insights from experts across Citi and our global network, from which we observe two key levers to support healthy aging:

1. **A preventive approach to healthcare**, like encouraging healthier lifestyles from a young age, could help to maximize the years lived in good health. This requires the collaboration of healthcare systems, pharmaceutical companies, civil society, and governments. Both Citi's Adam Spielman and Bayer's Mike Devoy highlight in their contributions to this report the importance of testing and early detection to boost preventive approaches to healthy aging.
2. **Innovation for diseases associated with older age** must continue. As the UK's Chief Medical Officer, Chris Whitty, noted in his 2022 lecture for Gresham College, "there are [...] diseases of old age which we do not have a good treatment for yet, such as the major dementias".⁶¹ While healthy aging can minimize the number of people affected by these conditions, innovation is a second lever to minimize the potential negative impacts of population aging. Aligning market incentives with the economic impact of these innovations will be key.

However, even if the health of an aging population can be improved, it is likely that demand for care will still increase. Currently, demand for formal care is projected to increase by almost 50% between 2020 and 2035.⁶² Meeting this demand is a significant question in its own right. In this chapter, we only articulate the economic motivation for enhancing care provision and explore some recent innovations that might contribute to increasing care provision – a) by joining the dots between health and long-term care and b) the specific example of "dementia villages".

Although we have examined them separately, the health and wealth of an aging population are closely linked. First, aging in good health is critical to enabling longer working lives. Second, in some healthcare systems, medical and care-related expenses are one of the most significant financial worries that adults report.⁶³ In some places, this worry is not unfounded: Charles Cavanaugh notes in his interview for this report that in his context of the United States, "*one of the most important costs [for individuals] to consider is healthcare*".

The healthcare industry is clearly key to supporting the health of an aging population. We therefore begin by highlighting the perspectives of a healthcare company and a healthcare investor on what aging means for the industry.

⁶¹ Whitty, C. 'The Future of Health Globally,' A lecture to Gresham College. 18 May 2022. Accessible [here](#) [Last accessed 10th April 2024]

⁶² Bureau of Health Workforce, 'Long-Term Services and Support: Demand Projections, 2020-2035'

⁶³ World Bank, *Global Findex Database 2021*



Dr Michael Devoy
Chief Medical Officer
Bayer

Dr Michael Devoy is the Executive Vice President for Medical Affairs and Pharmacovigilance for the Pharmaceuticals Division at Bayer AG. He is also the Chief Medical Officer of Bayer AG. Dr Devoy joined the former Schering AG in 2005 as Senior Vice President of Global Medical Development and was appointed to his current position in 2014.

Collaborating to Maximize Healthy Life Expectancy: An Interview with Mike Devoy, Chief Medical Officer, Bayer

What is needed to maximize healthy life expectancy?

For healthcare, it requires emphasizing preventive health, promoting a healthy lifestyle, and ensuring access to quality healthcare.

First, a preventive approach could stop people moving into the more serious stages of many diseases linked to aging. A good example is chronic kidney disease (CKD). If CKD reaches its end stages, it's a devastating disease which brings an enormous individual burden and huge costs to healthcare systems. If hypertension and metabolic diseases are treated early, we can reduce the risk. So, how can we start to detect these things earlier and intervene earlier?

Second, simple steps towards healthier lifestyles – like smoking cessation, dental hygiene, and even hearing tests – have significant benefits in preventing some of the diseases related to aging, including cognitive decline. Healthy lifestyles can therefore have a major impact at both the individual and public health levels. So, how can we encourage people in all age groups, not just those who are already older, to take ownership over their health as they age?

Third, we need to combat ageism. There are societal assumptions about how we should live as we age. Many of these are built on outdated notions that are no longer relevant because people can have very healthy lives for many more decades than in previous generations.

Have we made progress on maximizing healthy life expectancy?

I am optimistic. The UN's Decade of Healthy Aging is mobilizing a variety of stakeholders that must be engaged to improve the healthy life expectancy and the living conditions of older people, their families, and the communities in which they live. The UN Sustainable Development Goals also speak to some of these initiatives around awareness and access to quality healthcare.

Political decision makers and communities are beginning to recognize the need to support healthy aging. For example, New York City has defined itself as an age friendly city by committing to ensuring that its urban environment, policies, and services are designed to accommodate and support the needs of residents of all ages, particularly older adults.

What is the role of the pharmaceutical industry in contributing to healthy aging for all?

The primary role is to bring innovative medicines, new technologies and digital advancements to diseases that, if left untreated, can lead to a significantly less healthy old age.

We have seen a renaissance in the study of Alzheimer's disease. For some years this had been set aside as too hard to tackle. There is still a long way to go but now there is more optimism that innovations from the pharmaceutical industry and the wider scientific community will address it.

Cell therapies and gene therapies are another example as they start to be used to address degenerative conditions such as Parkinson's disease. As technologies of gene editing come onstream, perhaps we will be able to edit cells in a way that

interferes with the aging process. That is not a short-term intervention, but it shows how scientific advances might support healthy aging.

New scientific research and digital advances hold promise for dealing with some conditions associated with aging. A good example is the use of artificial intelligence and precision medicine to deliver the treatments that are best for individual people in a more targeted way.

Beyond innovation, the pharmaceutical industry, along with other stakeholders, also has a role in preventive health, aiming to assist individuals in avoiding hospitalization and the need for advanced medical interventions. While we cannot accomplish this alone, our goal is to promote longer-lasting health and prevent illness.

One contribution would be raising awareness. Bringing it back to the example of CKD – the pharmaceutical industry can raise awareness that if patients are living with a disease like hypertension or diabetes, they should be getting regular testing for kidney function or for protein in their urine. This could help reduce the rate of declining kidney function.

What would support the industry to make a bigger contribution?

More active collaborations with civil society, academia, healthcare systems, governments, and super-governmental agencies such as the World Health Organization would support the industry to make a bigger contribution. Together, we must employ creativity in finding ways to collaborate to unlock the scientific aspirations for healthy aging.

At Bayer we have been working hard to find public-private partnerships to help us bring forward innovations related to aging. Our new [Berlin Center for Gene and Cell Therapies](#), a joint project of Bayer and Charité Berlin, will be substantially funded and supported by Germany's Federal Government as well as the State of Berlin. It aims to bring groundbreaking cell and gene technologies to patients more quickly while creating a leading biotech ecosystem for innovative therapies in Berlin.

Next-generation technology is costly but offers a huge potential value to improving the lives of patients. Healthcare systems need to understand and acknowledge the importance of investing in these new breakthrough areas of medicine, and match the degree of innovation or risk taken by companies. At the same time public resources are limited and face competing priorities.

What are some of the latest innovations in addressing age-related and chronic conditions?

The innovations in personalized medicine and gene therapy that I talked about previously are significant. These are already in the clinic, and we might see gene therapies for neurodegenerative conditions this decade. Gene editing and addressing aging as a condition at the cellular level is another area of innovation that might emerge over the longer term.

Another example is treating the symptoms of menopause. Vasomotor symptoms, commonly associated with menopause, can have a debilitating impact and risks of conditions like osteoporosis and cardiovascular disease increase at that stage of life. It's essential to enhance awareness of these issues and advance therapies due to the substantial unmet need in this area.

How is longevity science evolving? We now talk of the “100-year life” – will it get longer?

I believe life expectancy will continue increasing. There are two camps in the aging and longevity world: there are super-optimists who think there's no limit to our lifespan and life expectancies might continue increasing beyond what we can now conceive. Others think there is some limit.

There are already humans living well beyond 100 years – some to 115 or 120 – and we have seen a steady increase in longevity over the last century. I don't think we have reached the limit of human life span yet. It remains to be seen where that limit will be, but I think we can look to a much larger proportion of our society living healthier, longer lives over the next decades.



Diane Wehner
Senior Portfolio Manager
Citi Global Wealth

An Investor Perspective on Aging: In Conversation with Diane Wehner and Wendy Agnew, Senior Portfolio Managers, Citi Global Wealth

What are the implications of population aging from an investor perspective?

This question goes far and wide. From a healthcare perspective, we know that as we age we use more healthcare products and services.⁶⁴ The cost on society is ever-increasing with healthcare spending already representing 18% of GDP in the U.S., around 12% in the rest of the developed world, and single digits (and rising) in emerging economies where a growing middle class expects and has the means to access better health care.

The growing demand for healthcare along with the rising costs of treating seniors are at the core of what drives the attractiveness of the healthcare sector where innovation is taking place with the dual objective of delivering better health outcomes at a lower overall cost of care.



Wendy Agnew
Senior Portfolio Manager
Citi Global Wealth

What are the most exciting innovations to support healthy aging?

Healthcare investing overall inherently leverages the theme of an aging global population. Studies show (and it intuitively makes sense) that as people age, they use healthcare services more often. Healthcare companies prioritize the advancement of science with the objective of keeping people healthy, and extending health spans which for an aging population translates into increased vitality and longer independence.

The shift taking place in the U.S. towards value-based care (outcomes-based care) away from fee-for-service is particularly relevant for seniors who may require more assistance with compliance and preventative care. Though gradual, this shift is most evident in the services space where managed care organizations and other healthcare service providers focused on Medicare Advantage provide a full suite of preventative services to Medicare recipients aimed at keeping them healthy. These services include for example, home health visits, transportation to doctors' appointments or medical procedures, and assistance with drug compliance.

Aging is often accompanied by the increasing incidence of chronic illnesses including type 2 diabetes, cardiovascular disease, osteoarthritis, Alzheimer's Disease and cancer. Some biopharmaceutical companies are innovating to address chronic conditions like these, for example:

1. After nearly two decades of failed attempts at effective **treatments for Alzheimer's Disease**, the FDA recently approved novel drugs shown to slow the progression of the disease in early-stage Alzheimer's Disease patients.
2. **GLP-1 drugs** are demonstrating effectiveness in managing type 2 diabetes while also addressing obesity and overweight conditions. In clinical trials, the incidence of diseases related to excess weight is also being reduced with the use of GLP-1 treatment, such as cardiovascular disease, osteo-arthritis, and obstructive sleep apnea.

⁶⁴ For discussion, see our article 'For investors, healthcare innovation is on sale,' in [Wealth Outlook 2024](#)

3. Advancements in **cancer treatment** utilizing biologics-based drug development platforms such as cell and gene therapies, immunotherapy, mRNA, and antibody drug conjugates are leading to new and more effective treatments for cancer and other diseases, oftentimes with less toxicity.
4. **Life science tools** companies that provide equipment and services that support the drug development process by partnering with biopharma to move drugs through clinical trials also play a role in this focus on chronic illness and the emergence of new biologic drug development platforms.

Medical device companies that address these chronic diseases with innovative devices that are either implanted in the body or worn on the body also contribute to supporting healthy aging. For example:

1. Companies that develop **externally-worn devices** to monitor vital statistics such as heart rate, blood pressure, blood glucose levels (continuous glucose monitors) are helping patients prevent or manage various diseases.
2. Minimally invasive procedures both manual and robotic are allowing older patients to benefit from **implantable devices** to address heart disease such as aortic stenosis or mitral regurgitation (leaky heart valve) as these procedures are less invasive and result in better surgical outcomes and faster recovery.
3. A more active senior population can also result in **increased incidence of injury** – think pickleball, tennis and golf – and with that increased activity, the need for orthopedic repairs such as rotator cuff repair or hip and knee replacements correspondingly increases.
4. **Diagnostic testing** to identify diseases early is a key factor in preventative care. Companies that offer genomic screening for colon cancer or blood tests to monitor the recurrence of cancer in patients in remission can lead to early intervention and better outcomes for patients.

Areas outside of the healthcare sector that address an aging population include industrial and technology companies that are focused on innovation in transportation and smart cities that are designed with a focus on urbanites' health and well-being.

The healthcare sector is not the only contributor to healthy aging.

Collaboration is key, as Mike Devoy told us: “maximizing healthy life expectancy requires the collaboration of healthcare systems, pharmaceutical companies, and wider society. No one group can achieve this independently.” The World Health Organization has articulated the need for a public health approach to aging.⁶⁵

Evolving the design of public spaces to both enable healthy lives and support older residents is one dimension.

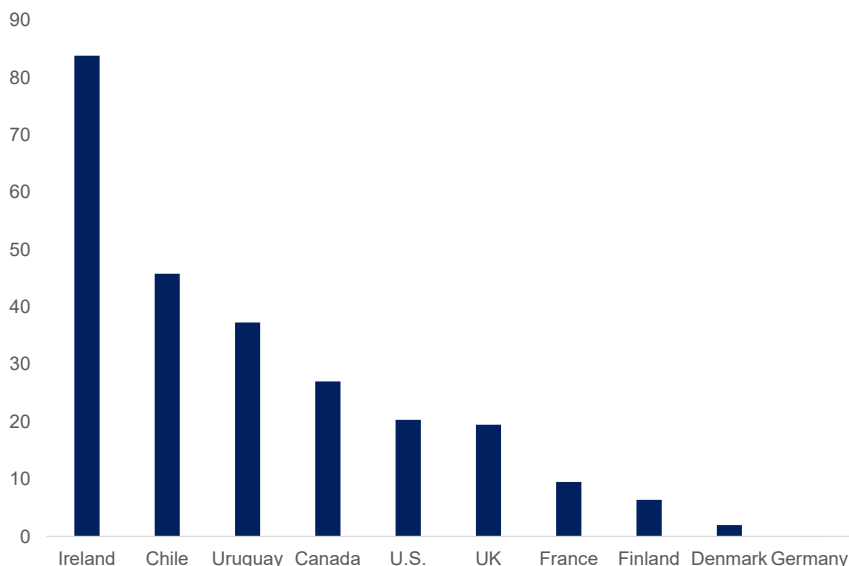
We have described in other reports how cities could be designed to support healthy lifestyles, by enabling “active transport” (i.e., cycling or walking) or by facilitating access to green spaces in urban areas.⁶⁶

Catering to older individuals is different – it involves increasing accessibility

in housing, healthcare, and public spaces.⁶⁷ For example, New York is now part of the WHO’s “Age Friendly Cities” network, and initiatives have included increasing the availability of public seating for those who might need to rest.⁶⁸

More than 1500 cities across 51 countries are now designated “age-friendly”. However, Figure 35 shows high variation in the share of the older population living in age-friendly cities in a selection of high-income countries, indicating that there is more to be done in making public spaces accessible.

Figure 35. Proportion of older people living in age-friendly cities and communities in 2023



Source: WHO

Dr. Louise Lafortune from Cambridge University also highlighted to us the role that age-friendly communities and micro-towns, like dementia villages, will play in supporting the health needs of an older population.⁶⁹ To illustrate, reporting on a

⁶⁵ World Economic Forum, 2024. *Longevity Economy Principles*, pp. 19

⁶⁶ Citi GPS, 2018, *Sustainable Cities: Beacons of Light Against the Shadow of Unplanned Urbanization*, pp. 107-9

⁶⁷ World Health Organization, 2007. *Global Age-Friendly Cities: A Guide* Accessible [here](#) [Last accessed April 24th, 2024] They define eight domains of age-friendly cities.

⁶⁸ <https://extranet.who.int/agefriendlyworld/afp/citybench-program/>

⁶⁹ For discussion, see: ADI, 2020. *World Alzheimer Report 2020: Dignity, Design and Dementia – Dementia-Related Design and the Built Environment*, Accessible [here](#) [Last accessed April 24th, 2024]

French dementia village has described shops that don't require payment upon purchasing groceries and appointments that run with no set times.⁷⁰ In other places, there are efforts to bring the local community into these communities, so that they don't just look and feel like villages – they actually *are* villages and towns.⁷¹ This is a more radical redesign of public spaces, which might become increasingly common as the population ages.

Public health approaches to healthy aging also include evolving health systems to reduce the prevalence of chronic disease, as Adam Spielman describes.

⁷⁰ Sophie Hutchinson, 2023. Landais Alzheimer – the village where everyone has dementia. Accessible [here](#) [Last accessed April 24th, 2024]

⁷¹ Joann Plockova, 'As cases soar, 'Dementia Villages' look like the future of home care,' New York Times. July 3, 2023 Accessible [here](#). [Last accessed April 24th, 2024]



Adam Spielman
 Head of Health
 Citi Global Insights

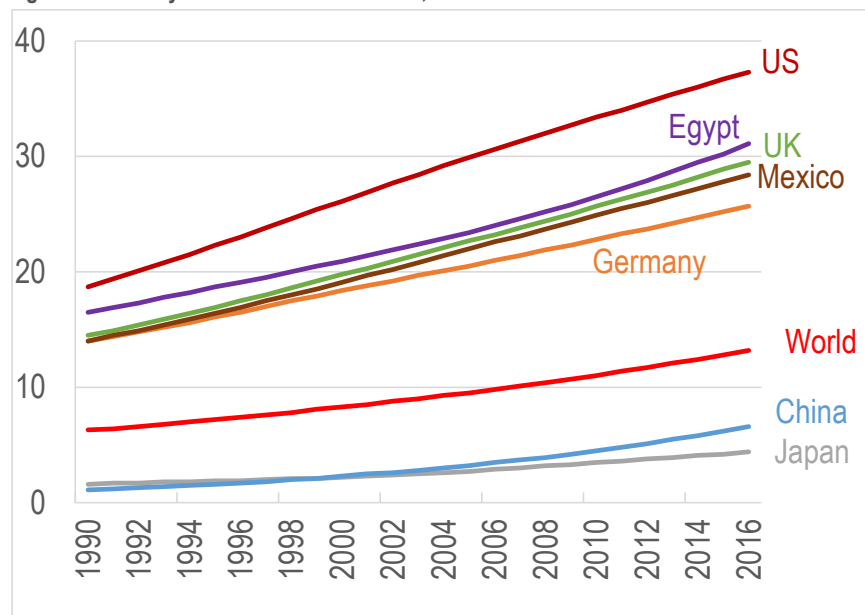
Adam Spielman is Head of Health and Consumer at Citi Global Insights. In the health area, his overarching thesis is that in time, healthcare will become more preventative, more personalized and more convenient, thanks to the convergence of the health, tech and consumer industries. In the consumer area, he focuses on the Future of Food.

Healthcare Systems and Healthy Aging

Healthcare systems in developed economies are already coming under increasing pressure – and absorbing an ever-higher percentage of GDP – as the population ages, so it’s easy to imagine the problems will become ever-harder to deal with. One example comes from the U.S.: Healthcare for over-65s is provided by Medicare, but the Medicare Board of Trustees says the fund for hospital spending will be run short of money by 2031.⁷²

A substantial majority of healthcare spending is on chronic diseases — things like dementia and diabetes — that are managed, not solved. Almost every chronic disease is made significantly worse by being over-weight, and (historic) trends in obesity look very poor as Figure 36 shows. The best way to reduce the burden of aging on the health system – and indeed on society as whole – would be to reduce the prevalence of chronic diseases.

Figure 36. Obesity rate in selected countries, 1990 to 2016



Source: Global Health Observatory, via OWID

There are a number of technologies on the (near) horizon, which we believe will do exactly that:

- **GLP-1s and reduced obesity:** For the first time, there is a really effective class of medicines to reduce people’s weight: the GLP-1 drugs. One example is semaglutide – sold as Ozempic and Wegovy. In a clinical trial, overweight people taking the drug lost about 15-17% of their body weight after 68 weeks, vs 2-3% for those taking a placebo.⁷³ As capacity increases and more GLP-1s get approval, we are confident that a substantial proportion of the population will use them, resulting in a decline in the proportion of the population that is overweight.

⁷² 2023 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds. Accessible [here](#) [Last accessed 10th April 2024]

⁷³ This was the STEP1 trial, which included almost 2000 participants. Wilding, J.P.H. et al. ‘Once-Weekly Semaglutide in Adults with Overweight or Obesity,’ *New England Journal of Medicine* 384 (2021) Accessible [here](#) [Last accessed April 10th 2024]

This in turn should help reduce the incidence of many chronic diseases, in particular diabetes, chronic kidney disease and cardiovascular disease.

- **Early detection and prevention:** Techniques are being developed in several areas to detect diseases earlier, before the symptoms become problematic, and when they are much easier to treat. For example new tests are being developed to detect type 2 diabetes and chronic kidney disease before people become symptomatic, allowing them to be addressed early enough to prevent these diseases becoming so burdensome. (For more details see our recent GPS report, [Future of Healthcare: The Oxford Prescription](#))

If we are right, and more people can remain healthy for more years, that will resolve many of the difficulties associated with aging societies.

But maximizing the years of life spent in good health is one thing, but there will always come a point in our lifespan when we need care. As the population ages, the demand for formal care is projected to increase by almost 50% between 2020 and 2035.⁷⁴ We believe it will be possible to re-organize healthcare in order to look after older adults more effectively.

In theory healthcare is distinct from other types of care because all treatments need to be approved by agencies like the FDA, after they have been shown, rigorously, to be safe and effective.

Generally, healthcare – and insurance -- works best for acute issues. An individual has a problem — maybe a disease, maybe an injury — they go to a doctor, who perhaps sends them to a hospital, and the system fixes the problem as best it can, and the individual goes home. However many older people, struggle with the ADLs [the activities of daily living], and therefore the assumption that these individuals can simply go home and look after themselves breaks down. At this point, healthcare blurs with social care, and the traditional distinction goes away.

As the proportion of the population that struggles with the ADLs grows, it is likely that the traditional structural separation between healthcare and other types of care will erode, allowing joined up solutions that work more effectively for older adults.

Case study: NHS England

The National Health Service in England provides a good example of how healthcare systems are likely to adapt. In 2022 NHS England was restructured with the aim to simultaneously improve healthcare performance and efficiency and to collaborate effectively with local providers, so health and social care are joined up effectively.

In the short term both health- and social-care are under extreme pressure in England due to limited national and local government funding. However, we believe that in the long-term, this type of integration between health- and social-care is likely to provide a template of how care can be provided for older adults most effectively.

⁷⁴ Bureau of Health Workforce, 'Long-Term Services and Support: Demand Projections, 2020-2035.' Accessible [here](#). [Last accessed April 10th, 2024]

Formal or paid care work is not the whole story when it comes to an aging population. Most care work is carried out by family members and friends. To illustrate: 14% of the U.S. population aged over 15 was engaged in providing unpaid care in 2021-22.⁷⁵ At a global level, women (the primary providers of care) spend an average of more than four hours undertaking unpaid care work every day.⁷⁶

If the supply of formal care cannot be brought to match demand, informal carers will likely fill the gap and the share of people engaged in unpaid care work will likely increase. Formal care is not uniformly preferable to unpaid care work,⁷⁷ but reliance on it has economic consequences.

Many unpaid care workers would prefer to be in formal paid work

Unpaid care work makes a significant economic contribution. One estimate found that if unpaid care work was paid at the rate of other caregiving, it would be valued at between \$2.5 and \$3.5 trillion.⁷⁸ Care work is hugely economically valuable, but providing it is a leading reason that women are out of the paid workforce: 647 million working-age adults, of which 606 million are women, are out of the labor force due to a responsibility to provide care⁷⁹ (Figure 37) and crucially, data suggests that many would prefer to be in formal paid work.⁸⁰ For women who stay at work while providing unpaid care, their caregiver status often results in less rewarding work compared with men.⁸¹

⁷⁵ US Bureau of Labor Statistics. Accessible [here](#) [Last accessed April 10th 2024]

⁷⁶ ILO. 2018 Care work and care jobs for the future of decent [work](#). Accessible here. [Last accessed April 11th, 2024]

⁷⁷ ILO. 2018 Care work and care jobs for the future of decent [work](#). Pp. 288. Accessible here. [Last accessed April 11th, 2024]

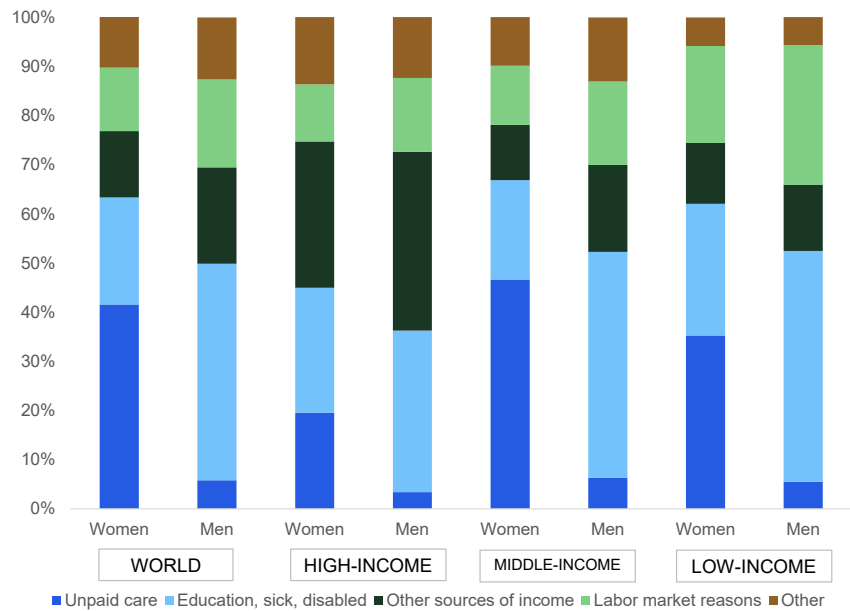
⁷⁸ BCG. 'Solving the \$290 billion Care Crisis' November 15, 2022. Accessible [here](#) [Last accessed April 11th, 2024]

⁷⁹ ILO. 2018 Care work and care jobs for the future of decent [work](#). Accessible here. [Last accessed April 11th, 2024]

⁸⁰ Gallup. 2017. *Towards a better future for women and work: Voices of Men and Women*. Accessible [here](#) [Last accessed April 11th, 2024]

⁸¹ ILO. 2018 Care work and care jobs for the future of decent [work](#). Pp. 287. Accessible here. [Last accessed April 11th, 2024]

Figure 37. Share of economically inactive people, by sex and reason for inactivity



Source: ILO (2018)

Key Actions for Supporting Healthy Aging

Access to good health is the second dimension in minimizing the level of economic and social dependence that an aging population brings. We have again articulated two high-level principles:

1. **Prevent the onset of dependence by supporting healthy aging**, for example by preventing ill health and innovating for the conditions of old age
2. **Prepare for a higher level of dependence by ensuring affordable access to healthcare for all**, including boosting the supply of care work, joining up health and social care systems, and supporting unpaid carers

These combine to address increasing dependence in the population. The first minimizes the effects of population aging, by redefining what it means to be a particular chronological age in terms of how healthy an individual is. The second prepares for a higher level of dependence in the population by ensuring access to high quality care for all. We again provide concrete examples of how to put these high-level principles into action in the Conclusion to this report.

Conclusion – Responding to Population Aging



Michael Hodin
CEO
Global Coalition on Aging

We said in Chapter 1 that population aging is a mega-trend that demands a response rather than attempts to reverse its course. This is necessary to address not only our longevity but also the shift to a society with more older people than younger people.

We then argued in Chapter 2 that the most pressing challenge posed by the demographic transition is that of increasing dependence or the idea that a growing older population will lead to an unsustainably shrinking workforce with economic and social implications.

However, we suggested that while the trend towards a population that is older than it ever has been is intractable, dependence is not – it can be altered by focusing on the health and wealth of our aging population.

Steps to minimize the level of dependence in the global population will be wide-ranging. From the contributions collated in Chapters 3 and 4, from experts at Citi and across our global network, some high-level recommendations arise. Supporting economic resilience and good health, including earlier and more effective access to appropriate care, can help minimize the dependence of an aging population.

Economic resilience and good health can be decomposed into an attempt to maximize the length of time in which individuals are contributors rather than dependents first, followed by a second intervention which prepares for increased social and economic dependence. Under the first banner, we include facilitating longer working lives and healthy aging; under the second, boosting financial inclusion and access to healthcare and support services.

The contributions collated in the previous two chapters also make these high-level recommendations more concrete by providing specific examples and actions that could form part of a response to population aging.

The table below collates some of these concrete recommendations into a tear sheet, co-produced with the Global Coalition on Aging (GCOA) and drawing upon their work on demographic change. In structuring these recommendations, we build on the series of guiding questions that have been previously published by the GCOA.⁸² Private sector actors can use the following tear sheet to understand what might constitute answers to GCOA's guiding questions.



Melissa Mitchell
Executive Director
Global Coalition on Aging

⁸² GCOA, '[Decade of Healthy Aging Demystified](#)' July 2022. [Last accessed 19th March 2024]

Figure 38. Supporting the Health and Wealth of an Aging Population

	Supporting Economic Resilience	Addressing the Impact of Declining Health
Minimizing Dependence and Supporting Contribution	<p><u>Longer Working Lives</u></p> <ul style="list-style-type: none"> Listen to all generations of workers to understand and respond to their needs as they evolve across their working lives. Deploy technology to reduce the physical and mental strain associated with work and to boost productivity. 	<p><u>Healthy Aging</u></p> <ul style="list-style-type: none"> Consider a Chief Public Health Officer, to elevate discussion of employee, customer, and community health.ⁱⁱⁱ Enable the prevention of ill-health, for example through health screenings or adult vaccination clinics. Apply an aging lens to community engagement and giving.
	<p>An often-cited example is an initiative at BMW manufacturing plants in Bavaria, Germany,ⁱ where workers together with managers and technical experts implemented productivity-boosting interventions for an aging workforce.</p>	<p>Increasing access to health screening should extend to the workplace and other settings where people gather and have trust. One GCOA initiative with Novartis started a partnership with Baltimore churches and senior centers to roll out screening for cardiovascular disease together with health education.^{iv,v}</p>
	<ul style="list-style-type: none"> Consider the suitability of office environments for all workers: for example, are signs in the building large enough for everyone to see? Is the level of light sufficient for all colleagues? Increase flexibility by considering part-time, hybrid and remote options for workers. Consider allowing sabbaticals or other forms of extended leave. Develop employees' skills across their career to facilitate innovation and entrepreneurship into later life. 	<ul style="list-style-type: none"> Ensure physical footprint, especially in public spaces, is conducive to age-friendly cities – for example, by improving accessibility of buildings or contributing to transport networks. Center mental health in wider occupational health initiatives as a key enabler of longer working lives. Apply a gender lens to healthy aging, for example by adopting menopause benefits or raising awareness.
	<p>While many tech founders are in their 20s and 30s, Morris Chang is a high-profile example of a successful middle-aged founder: he founded Taiwan Semiconductor at age 55.ⁱⁱ</p>	<p>The UK's Equality and Human Rights Commission issued guidance which clarified the legal need to make reasonable adjustments for women experiencing menopause in 2024.^{vi}</p>
	<ul style="list-style-type: none"> Tackle ageism or stereotypes about what people of a particular age are or should be, through storytelling and Employee Resource Groups connected to age and life stage. Address health inequities to ensure that all can have as long a working life as they would like. 	<ul style="list-style-type: none"> Collaborate with other stakeholders, including civil society and governments, to drive progress on healthy aging.
Preparing for Increased Dependency	<p><u>Financial Inclusion and Access to Planning</u></p> <ul style="list-style-type: none"> Ensure that financial planning tools reflect longer life expectancies, including accounting for more time in retirement or blended approaches to retirement. 	<p><u>Access to High Quality Healthcare</u></p> <ul style="list-style-type: none"> Include benefits related to eldercare in employee packages as a parallel to childcare. Explore how new technologies and platforms can streamline the experience of providing care.
	<p>GCOA and TIAA Institute recently identified the range of benefits needed at various life stages within the longer working life. Their report suggests employers should include financial education, access to savings tools, advice and benefits as part of employee attraction and retention strategies.^{vii}</p>	<p>The 2021 acquisition of Home Instead by Honor Technology set out to deliver high-quality care at scale. Combining a proven tech and operations platform with industry-leading care training and relationship-based model will transform care for caregivers and care recipients.^{ix}</p>
	<ul style="list-style-type: none"> Boost accessibility of impartial financial education and support individuals to understand the costs they may encounter in later life – including healthcare and long-term care costs. 	<ul style="list-style-type: none"> Continue medical innovation to address conditions associated with older age (like Alzheimer's disease, osteoporosis) and chronic conditions that prevent healthy aging (like cardiovascular disease, diabetes, cancer). Integrate healthcare and long-term care provision to drive efficiencies.

	<p>Blackrock’s Larry Fink noted in his 2024 Annual Chairman’s Letter to Investors the importance of making saving for retirement more accessible – or even automatic in the U.S.^{viii}</p>	<p>An example of integrating healthcare and long-term care was NHS England, where connectivity is facilitating more joined up thinking. See pp. 60)</p>
	<ul style="list-style-type: none"> • Apply a gender lens to financial planning recognizing that women’s pattern of earnings over their career and health spending over their life course put them at particular risk of financial insecurity. • Drive fair pay and offer savings mechanisms to boost capacity to save both for later life and for shorter term emergencies. 	

i. Christoph Loch et al. 'The Globe: How BMW Is Defusing the Demographic Time Bomb,' *Harvard Business Review*
 ii. For recent coverage of Chang's story, see Ben Cohen, 'He Turned 55. Then He Started the World's Most Important Company,' *Wall Street Journal*. March 29, 2024.
 iii. GCOA, 'Employers' Role in the COVID-19 Pandemic: Winning in the Vastly Changed World of Work'
 iv. For more details, see Gliadkovskaya, A. 'Global Coalition on Aging, partners launch community health initiative to address CVD in Baltimore'
 v. For more about the initiative, see here: <https://engagewithheart.org/>
 vi. Ali Abbas Ahmadi, 'Firms must help menopausal workers, or face being sued' BBC. February 22nd, 2024.
 vii. GCOA and TIAA Institute, Knowledge Brief: Best Practices for Employee Benefits in Different Life Stages, October 2023.
 viii. Blackrock’s Annual Chairman’s Letter to Investors. 2024.
 ix. Honor Acquires Home Instead to Transform Care Experience for Caregivers and Older Adults, August 6, 2021.
 Source: Citi GPS, Global Coalition on Aging

Clearly not all recommendations can be taken up by all private sector actors. For example, only healthcare companies can continue to innovate for the conditions of old age and evolving financial planning to support longer lifespans is the responsibility of the financial services industry. Yet, any company, large or small, can begin to take steps to adapt to the evolving and aging population, which impacts employees, families, communities, health systems and economies.

Moreover, there are many elements of the response that are not included in this summary especially for policymakers – for example, we have not discussed how public spending might need to evolve given this demographic transition. **These recommendations are not a total prescription: they are a starting point, which we hope help to launch and amplify conversations about how the private sector can support the health and wealth of a population that is older than it ever has been.**

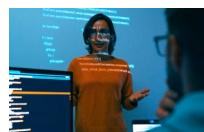
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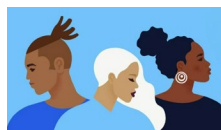
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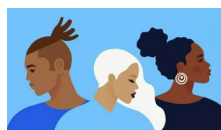
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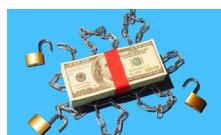
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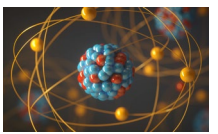
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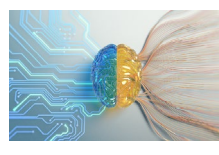
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