Demographics, aging and
income protection

ZURICH

Rethinking how society ages

Introduction to an aging world

We need to get better at planning for the risks – and opportunities – associated with aging.

Demographic change will affect us all

Navigating this report:

Our world is increasingly populated with people over the age of 65.

What does this mean for public pensions, economic growth, and a number of other aspects critical to economies?

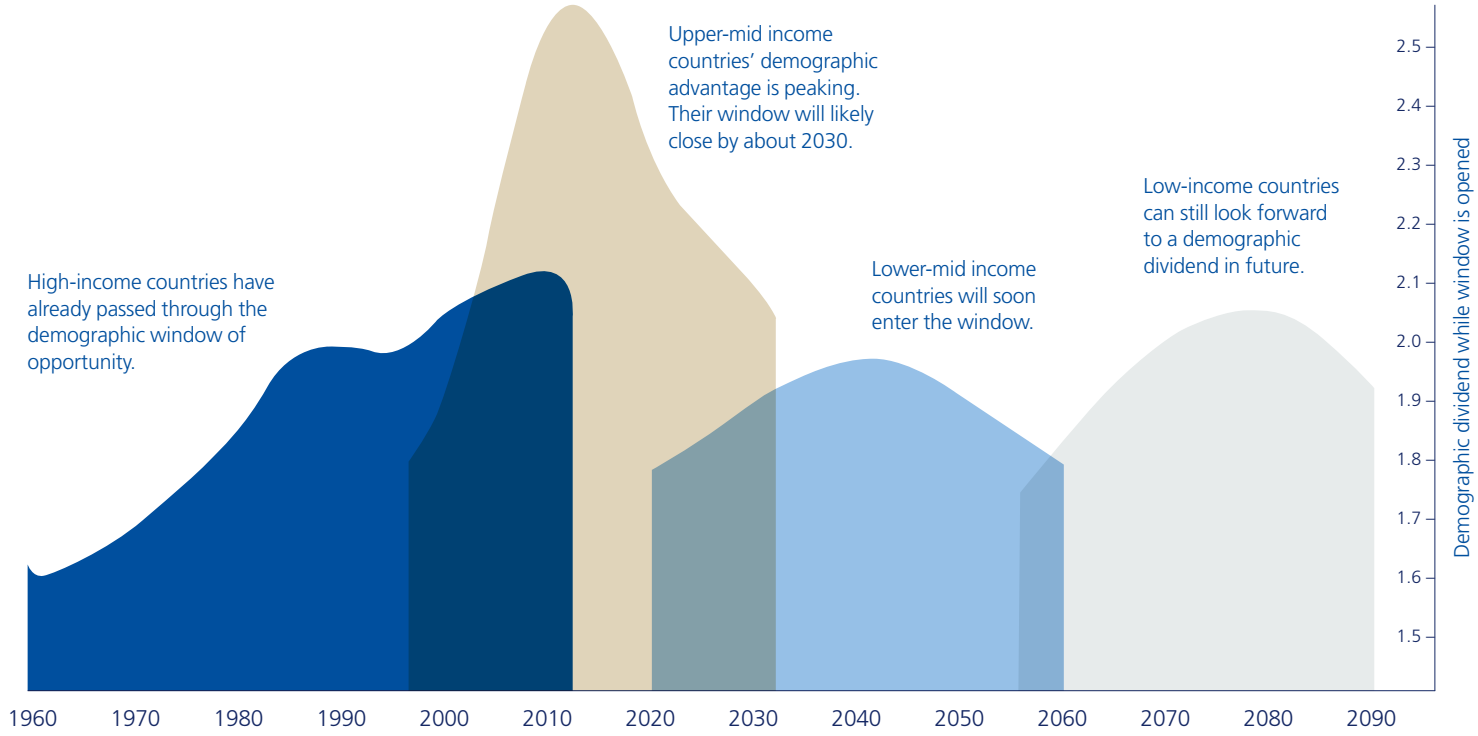
We need to make the right choices to ensure that aging is treated by society as an asset.

For societies with an increasingly large proportion of older citizens, opportunities and challenges will require creative solutions and a willingness among policymakers, corporations and individuals to find the best way forward.

What is the demographic sweet spot?

The sweet spot is when societies have less than 30 percent of population younger than 15 years of age and less than 15 percent aged 65 or older.

Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver.



Countries pass through a demographic window – a 'sweet spot' – which describes the period when a large working-age population supports relatively small young and older populations.

The UK, U.S., Germany, France, Japan and many other wealthy countries (dark blue) have already passed through the window of opportunity associated with the current aging cycle have enjoyed more than 50 years in this advantageous window. They have had a relatively a long time to adjust to the changes that an aging society requires. China, India and Brazil and other countries (brown) are in this window, but are 'peaking.'

These countries will soon start to feel the impact of aging. Lower-middle, and low-income countries (light blue and gray, respectively) can still look forward to entering this 'sweet spot' in the decades ahead.

Where are countries in the aging cycle?

The chart shows the number of years needed for population 65 and older to increase from 7 percent to 14 percent. The numbers to the right of the bars show how many years it will take for that older segment of the population to double (7 percent to 14 percent).

Those countries at the top still have the demographic sweet spot ahead; those in the middle are in it now; the countries at the bottom have already completed this transition.

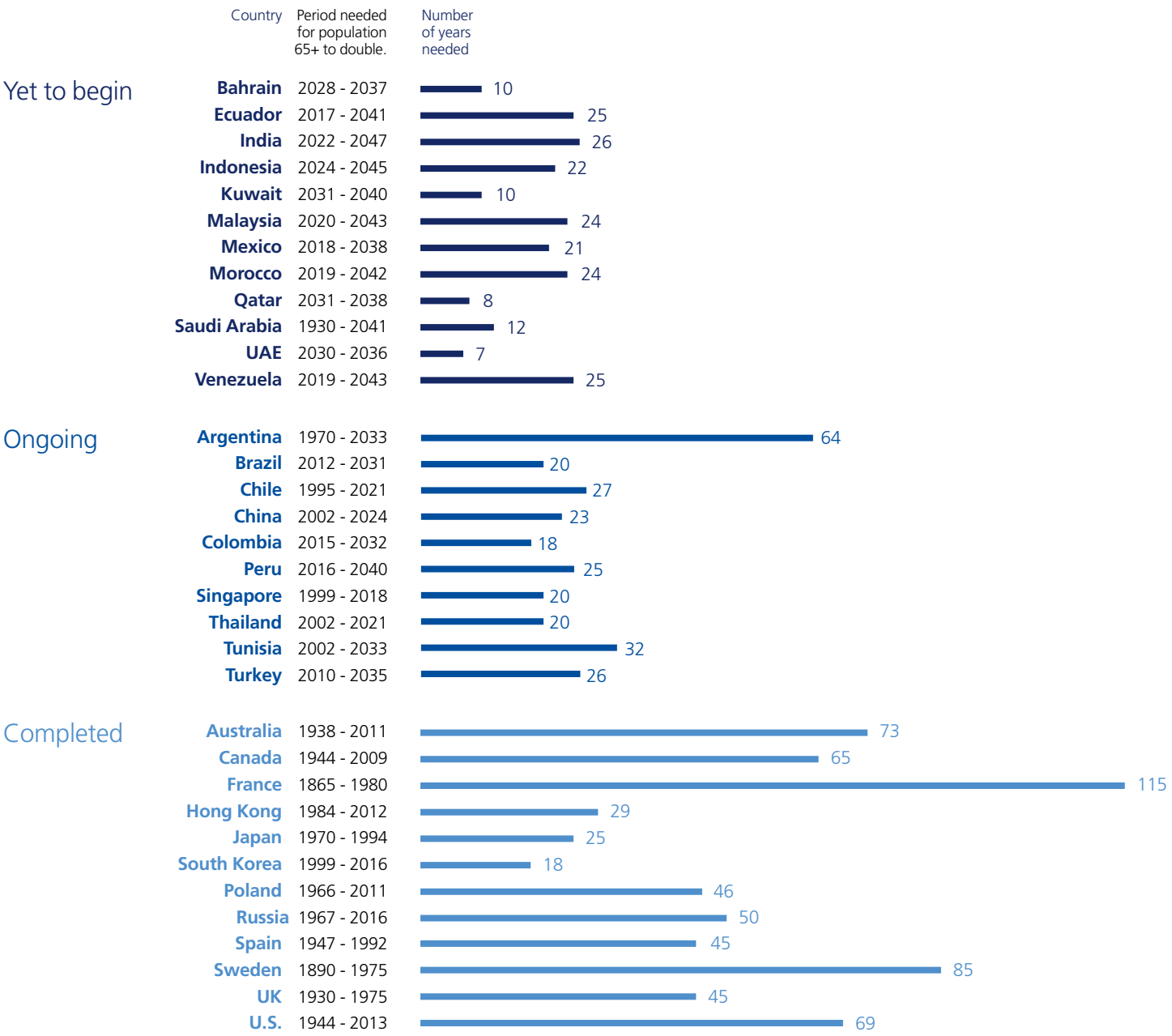
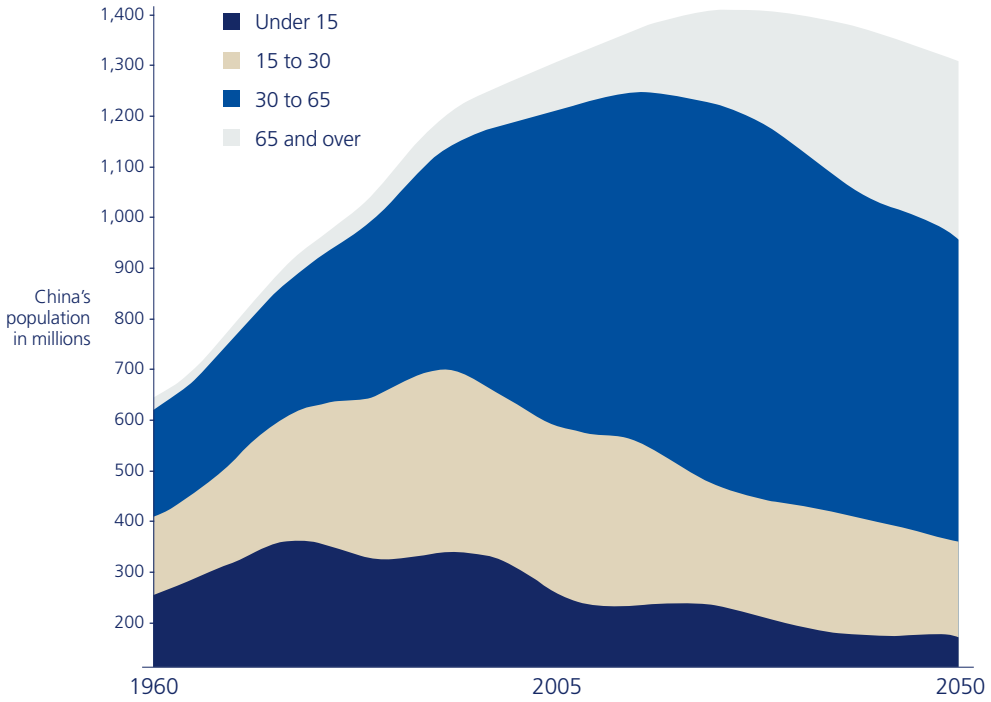


Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver; and Kevin Kinsella/Yvonne Gist, 'Older Workers, Retirement, and Pensions: A Comparative International Chartbook.' IPC/95-2. U.S. Department of Commerce, U.S. Department of Health and Human Services, Washington, D.C. (1995).

China is ‘aging’ five times faster than France did. What does that mean for the rest of the world?

Chart based on a model produced by the Frederick Pardee Center for International Futures in Denver.



France’s share of population 65 years and older doubled over a period of 115 years.

China’s share of the population 65 years and older reached the seven percent mark in 2001; this population is forecast to surpass 14 percent by 2025 – just 24 years to complete a transformation that France experienced between 1865 and 1980!

Demographic shifts are affecting cultural norms: in China, elderly care was traditionally kept in the family. But as the proportion of care-givers shrinks, a new class of private sector facilities has sprung up catering to elderly Chinese, making for a significant change in social ties.

The annual Chinese pension spending gap (retirement needs – if the average worker retires at the age of 65 – minus government pension transfer capacity) could grow from about USD 200 billion in 2015 to between USD 1.4 trillion and USD 1.8 trillion in 2035, according to estimates by the Frederick S. Pardee Center for International Futures in Denver.

“China’s success is important to us all, particularly those in its neighborhood who depend on it to spur growth.

The Chinese leadership has set a goal for China’s average per capita income to reach Western levels by 2049. That’s a formidable challenge. With fewer people in their prime working years, that goal will be all the more difficult to achieve.

Rapid aging will further reinforce the inclination among many Chinese to remain big savers despite government efforts to boost domestic consumption.”

Mathew Burrows, Atlantic Council

If we live longer, will we also live better?

How secure is my retirement income?

The risks a disability pose to personal income and quality of life must be considered even more carefully in an aging society.

As we get used to living to a ripe old age, our risk of becoming disabled also increases. People in wealthy countries not only face a greater chance of health disorders commonly associated with affluence (certain types of cancer, heart disease and obesity); living longer and possibly working longer increase the odds that, for some time in our working lives, we may become disabled.

In an aging society there will be a shift toward diseases that mainly affect older people. For example, in the U.S. from 2004 to 2014 deaths generally declined, but those attributable to Alzheimer's disease increased.[1] Most people with Alzheimer's are 65 or older.

In high-income countries, actual public health spending will probably not keep pace with demand. By 2035, government spending in these countries will cover less than half of what is needed – 49 percent – compared with 62 percent in 2015, according to models by the Frederick S. Pardee Center for International Futures in Denver.

There may be reasons some people want to work longer. It could actually keep you healthy. A study of nearly 500 Americans suggests later retirement may prolong life, independent of a wide range of variables including lifestyle and health.[2]

What happens if you become disabled when the age for state pension eligibility has increased?

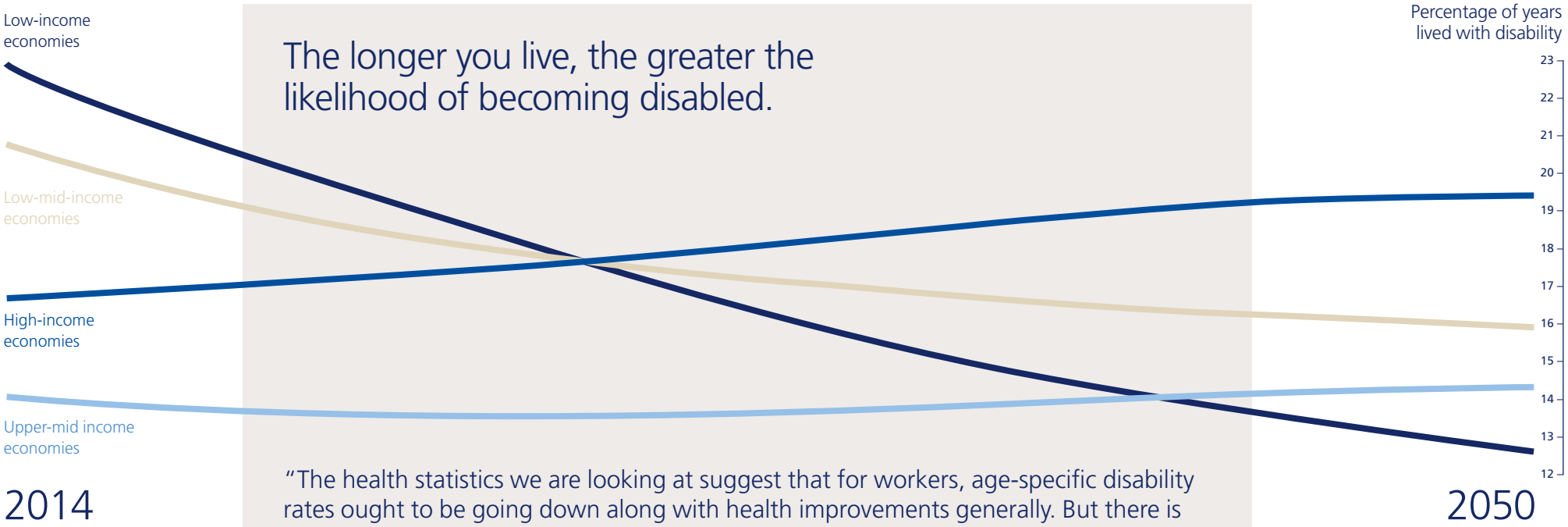
How will reduced state support affect public disability payments?

As people live longer and choose to work longer, how will employers address the potential increase in disabilities among working populations?

1
U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, United States, 2015 http://www.cdc.gov/nchs/data/hus/hus15.pdf

2
Journal of Epidemiology & Community Health, abstract, published 21 March 2016. http://jech.bmj.com/content/early/2016/03/21/jech-2015-207097.abstract

The longer you live, the greater the likelihood of becoming disabled.



"The health statistics we are looking at suggest that for workers, age-specific disability rates ought to be going down along with health improvements generally. But there is evidence suggesting that age-specific disability registrations are, in fact, going up."

Barry B. Hughes, John Evans Professor and Founding Director, Frederick S. Pardee Center for International Futures in Denver.

Age-specific disabilities might indeed be on the rise, if, as believed, some illnesses are recognized today as disabilities that were not considered such in the past.

People who live (and work) longer may require more extensive and expensive health care. Age-related disability has also traditionally been encouraged by welfare systems to act as a bridge to retirement.

In an earlier study> published by Zurich and the Smith School of Enterprise and Environment at Oxford University in October 2015, a key finding was that medical diagnoses may increasingly recognize disabilities that were not always considered as such in the past.

"Things that are recognized today as illnesses may not have been so 20 years ago. There is a societal change that affects what is diagnosed as a medical situation," according to Benno Keller, Head Research and Policy Development at Zurich.

"Reducing disability pensions for persons with disabilities, either through lowering pension income or reducing participation, could significantly reduce the welfare of some beneficiaries whose incomes are often already well-below national averages. Unless matched by offsetting measures, this could have an adverse impact on poverty."[3]

3 The Challenge of Public Pension Reform in Advanced and Emerging Economies.' International Monetary Fund, 2011: www.imf.org/external/np/pp/eng/2011/122811.pdf

Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver.

Income protection gaps

An income protection gap is defined as the reduction in household income as a consequence of the incapacitation or death of an adult wage earner on whom that household relies, taking all public and private sources of replacement income into account.

Simply put, it's the difference between what you earned when working versus the income you would get due to disability.

The risk of such gaps must be viewed within the context presented in this and related studies. To learn more the risks associated with such 'income protection gaps,' please refer to a series of studies > in this report.

Age, as might be expected, age can play a major role in disabilities. According to a European Union (EU) survey of 14 EU countries, only 3.1 percent of persons aged 15-64 found it difficult to do at least one activity of daily living by themselves. For those 65 and older, it was much higher 24.8 percent.

The rate of severe difficulty to perform at least one daily activity was just 0.9 percent for those aged 15-64, but 10.9 percent for persons 65 and older.[1]

1
European comparative data on `Health of People with disabilities Task 6: Comparative data and indicators.' Final report prepared by Stefanos Grammenos from Centre for European Social and Economic Policy (CESEP ASBL) on behalf of the Academic Network of European Disability Experts (ANED) December 2014.

www.disability-europe.net/theme/comparative-data/reports-comparative-data

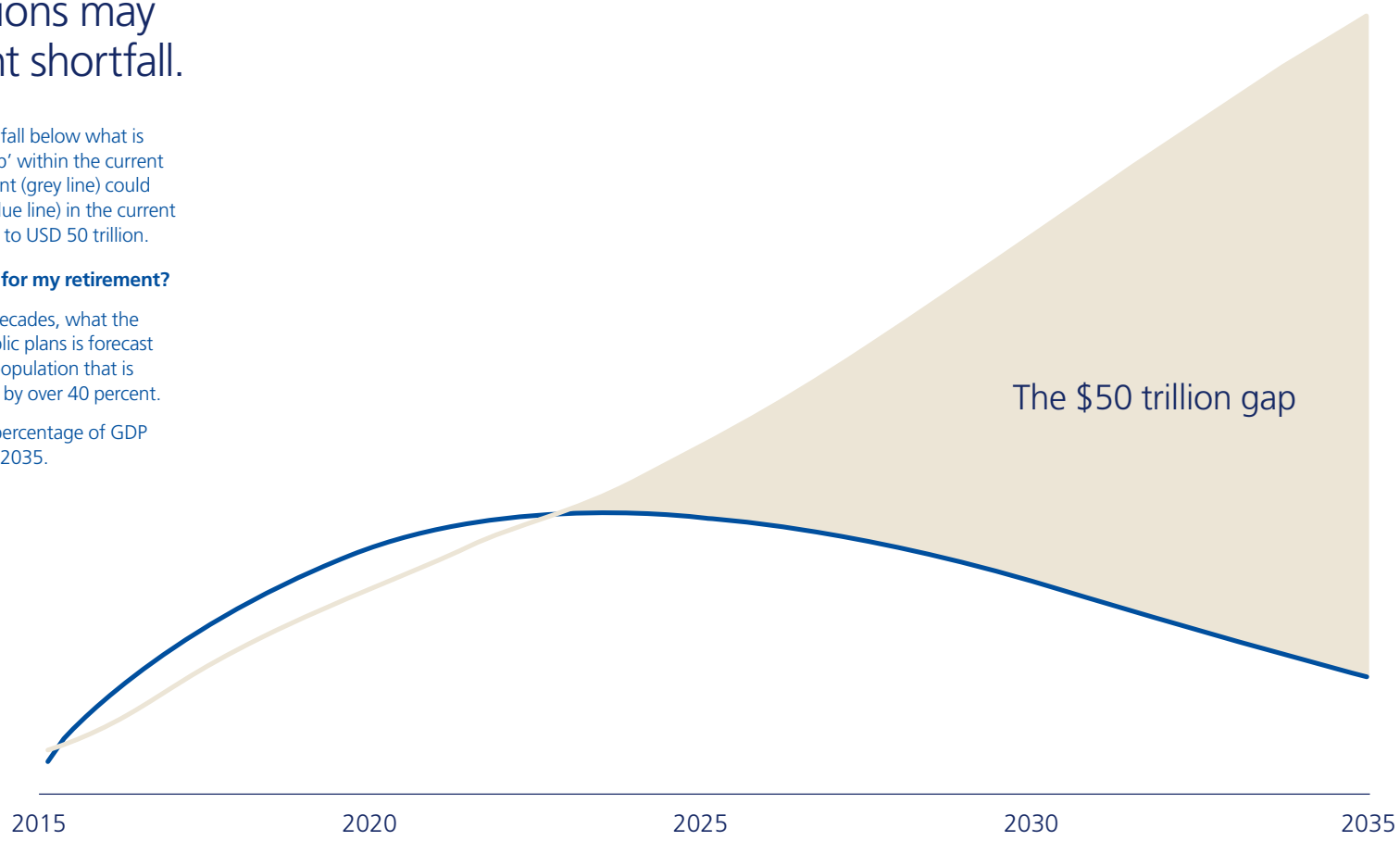
Planning to retire? Or, maybe not. Pensions may be facing a significant shortfall.

In wealthy countries, savings are expected to fall below what is needed for retirement, creating a 'savings gap' within the current decade. The savings needed to fund retirement (grey line) could exceed the actual level of savings available (blue line) in the current decade. By 2035 the gap is forecast to widen to USD 50 trillion.

Who will pay for economic growth – and for my retirement?

In high-income countries over the next two decades, what the government pays out to pensioners from public plans is forecast to grow by 25 percent. But the share of the population that is 65 and over in these countries could increase by over 40 percent.

In wealthy countries, pension spending as a percentage of GDP could increase by three percentage points by 2035.



Savings stocks of elderly people are expected to be vastly outstripped by the amount of **savings needed** over the next decades.

Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver.

Living longer means working longer.

Barry B. Hughes, John Evans Professor and Founder, Frederick S. Pardee Center for International Futures in Denver, whose team did the research for this report, believes the retirement age could increase by over a year in wealthy countries between now and 2035.

"The effective retirement age is going to go up even more in the lower-income countries where life expectancies are rising more sharply."

Average pension income relative to average working income has decreased for both men and women in all income categories over the past ten years.

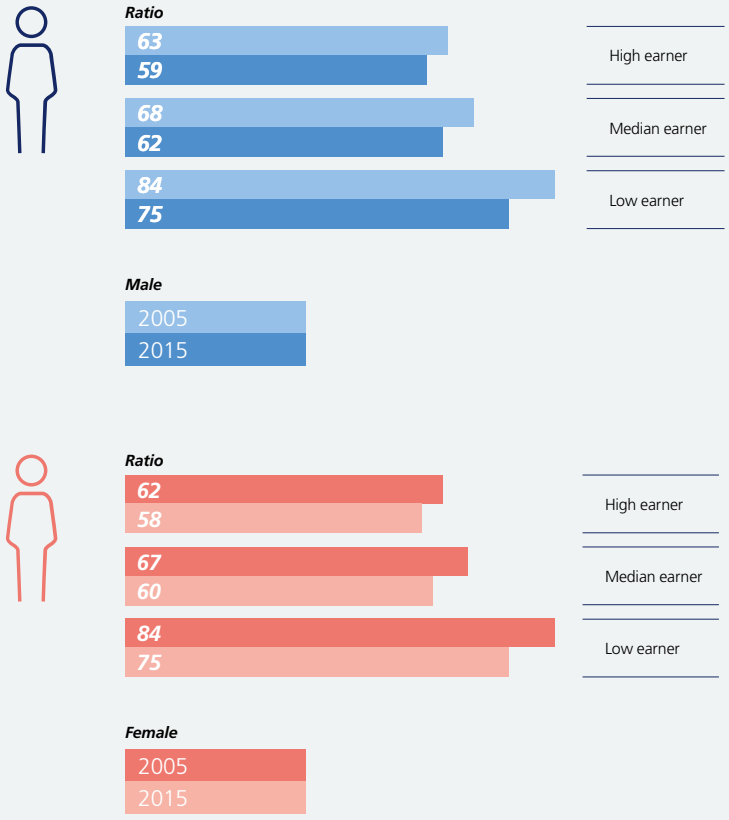


Chart based on pension replacement rates (average pension income/average wage while working) for high-income countries by earnings categories and gender. Source: IMF (see footnote)

And we're already working longer for comparatively less retirement income.

Based on International Monetary Fund data, while pensionable ages have increased and are likely to continue doing so, life expectancy is increasing at a considerably faster pace. The resulting strain on pension funds could lead to reduced benefits. Data from the IMF suggest that's already happening: relative to working income, average pension income has declined over the past decade, as the chart at the left shows.[1]

[1] 'The Challenge of Public Pension Reform in Advanced and Emerging Economies.' International Monetary Fund, 2011: https://www.imf.org/external/np/pp/eng/2011/122811.pdf

The term mature economies is taking on a whole new meaning as pension demand increases.

The impact of aging on the overall economy of a country might fall into three categories: changes in investment rates and capital formation (accumulation) due to age-related decisions to save and consume; changes in the overall share of the working-age population; and productivity changes tied to what is available to spend on physical capital (for example, infrastructure), and education, categories where spending may be needed to bolster economic growth necessary to fund public pensions.

Germany and China, as well as many other countries, will likely face a significant increase in pension needs relative to GDP over the next 20 years.

	Working Age Population		Pension Needs	
Country	**Workers % of total population 2035**	**Change 2015 to 2035**	**Pension needs as % GDP 2035**	**Change 2015 to 2035**
Brazil	66.2	-2.9	11.9	6.0
China	65.2	-7.9	10.5	6.2
France	58.5	-4.0	15.6	3.6
Germany	56.4	-9.3	20.3	7.0
Hong Kong	59.2	-13.8	22.3	11.4
India	68.5	3.0	6.2	2.5
Italy	56.8	-7.1	21.6	6.0
Japan	56.5	-4.3	15.7	1.6
Mexico	66.9	1.0	8.6	3.8
Nigeria	57.7	4.3	2.6	0.3
Switzerland	60.5	-6.6	14.9	4.3
UK	60.1	-4.4	15.1	2.6
U.S.	60.6	-5.7	14.3	3.5

Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver.

"Preparing for demographic-related societal risks, such as limited educational resources, slowing economic growth, dwindling pension reserves, and strained healthcare is the responsibility of governments, firms, and individuals alike. Foresight plays a crucial role in mitigating these risks by not only identifying where reforms are necessary to escape fiscal crisis, but also encouraging implementation of them early enough to take full advantage of favorable demographic trends."

David Bohl, Research Associate, Frederick S. Pardee Center for International Futures in Denver.

> "Demographic change can be so slow-moving as to be nearly imperceptible over short time-horizons, but the macro-economic, financial, and social implications can be enormous."
>
> Mathew Burrows, Atlantic Council

As pension demand increases, so too will healthcare costs. An age-related shift in spending is expected.

In high-income countries, the greatest growth will be in pension and health spending, driven by demand from aging populations. That has a large chance of driving out any significant increases in other categories, especially traditional infrastructure (mostly roads, water, and sanitation) but also education, research and development (R&D), the military, other infrastructure, and other spending.

As populations age, spending in many countries will shift to accommodate increased healthcare costs, while education spending will decline in relative terms.

	Healthcare costs % of GDP		Education costs % of GDP	
Country	**Healthcare costs % of GDP 2035**	**Change 2015 to 2035**	**Education costs % of GDP 2035**	**Change 2015 to 2035**
Brazil	13.6	4.0	4.4	-1.0
China	8.3	2.8	4.4	-0.2
France	15.2	3.4	4.3	-0.2
Germany	15.7	4.4	3.7	-0.1
Hong Kong	6.8	2.8	3.4	0.3
India	4.2	0.2	5.9	-0.7
Italy	12.9	3.8	3.3	-0.2
Japan	15.8	5.5	3.0	-0.1
Mexico	8.1	1.9	4.9	-1.1
Nigeria	3.7	1.5	10.4	1.7
Switzerland	16.3	4.4	4.2	0.0
UK	11.6	2.3	4.7	0.0
U.S.	24.1	6.4	4.3	-0.2

Chart based on a model produced by the Frederick S. Pardee Center for International Futures in Denver.

Would migration help aging economies?

Migration may influence demographic change to a greater extent in coming decades, according to models produced by the Frederick S. Pardee Center for International Futures in Denver.

It could provide economic benefits for countries with slowing or negative population growth, helping to offset a decline in the working-age population. But the gains are not clear-cut. And social tensions can also arise, putting pressure on incumbents, and causing voters to vent their frustrations by favoring politicians calling for measures to slow immigration.

Why we care about demographics

Demographic change will have an enormous impact on economies and societies over the coming decades. Aging populations will lead many countries to embark on major initiatives that will test the limits of resources and the skills of those in charge of public policy and in private sector organizations.

This report is based on a longer study commissioned by Zurich Insurance Group, the global insurer. The research was conducted by the Atlantic Council, a U.S.-based research organization and the Frederick S. Pardee Center for International Futures at the University of Denver. It is based on a unique forecasting system developed by the Pardee Center>. For the full study, see www.atlanticcouncil.org.

What was once a youth bulge in many societies is now turning into a decided trend toward older societies. In this sense, societies are aging: What implications will this have for public pension and healthcare costs? Which countries will face the biggest challenges, or opportunities?

Living longer increases the risks: What shifts in demographics are underway, and what are the implications of aging for our own working lives and retirement?

Aging can affect spending on healthcare, education and infrastructure: How can growth be achieved in economies with a smaller number of working people?

We will be providing more insights on this and other topics released to demographics in the months ahead.

People who contributed research and ideas to this report.

David Bohl

David Bohl is a Research Associate at the Frederick S. Pardee Center for International Futures in Denver. Besides working to extend the modeling and forecasting capabilities of the IFs model, he has assisted Peru's Centro Nacional de Planeamiento Estratégico (CEPLAN) to improve forecasting, particularly of the informal economy, and is developing a crowd-sourced data analytics platform.

Mathew Burrows

Mathew Burrows is the Director of the Atlantic Council's Strategic Foresight Initiative. His areas of interest include emerging technologies in defence and national security, global trends, non-traditional threats, and urbanization. He publishes frequently on topics of international policy and strategy.

Barry B. Hughes

Barry B. Hughes is John Evans Professor and Founding Director, Frederick S. Pardee Center for International Futures in Denver, and creator of International Futures (IFs), a widely-used computer-based simulation approach for forecasting changes in long-term national, regional and global trends. His interests include economic, energy, food, population, environmental, and socio-political forecasting and policy analysis.

Benno Keller

Benno Keller is a professional economist. His focus areas include economic research and analysis, financial market and insurance regulation and issue management. He holds a doctorate in economics and social science from the University of Fribourg and has published on a number of insurance economic, regulatory and policy issues.

David Swaden

David Swaden is Senior Policy Development Manager, Group Public Affairs, at Zurich Insurance Company. A strategic communications specialist, he manages content creation and positioning across a number of Zurich's priority public policy areas. His current focus includes aging and income protection gaps, digitalization and cyber security.

About the Pardee Center's International Futures model (IFs)

The International Futures (IFs) integrated assessment tool to model the demographic dynamics of 186 countries and forecast their change and impacts through the year 2035, often looking somewhat beyond that year so as to put the change in still broader context. IFs is highly integrated across multiple human, social, and environmental systems and therefore allows us to better understand the impact that aging and demographic change can have on issues such as economic growth, government finance, and social stability.

The Pardee Center uses a forecasting system based on an interrelated set of models. There are four models that are most relevant for the work done using the International Futures (IFs) integrated assessment tool in this project.

These include a population model which has the typical cohort-component structure that the United Nations Population Division also uses in its forecasts. That is, it annually tracks the numbers of people by age and sex through their life course, adding births, removing deaths, and adjusting for migration.

The health model is one that the IFs project adapted from the World Health Organization's Global Burden of Disease Project and linked to mortality in its population model. It represents age and sex specific mortality and morbidity/disability in 15 categories across the three primary groupings in the International Classification of Disease, namely communicable disease, non-communicable disease, and injuries/accidents.

The economic model is a general equilibrium system that represents demand and supply in six major sectors. It draws data heavily from the Global Trade Analysis Project, the World Bank, and the International Monetary Fund. Labor supply links it to the demographic model, while GDP per capita feeds back to both the population and health models.

The governance finance model uses data and approaches from the same sources to build a social accounting matrix framework around the economic model that tracks revenue and expenditure patterns of households, firms, and government (including direct government expenditure in areas such as education and health and including transfer payments such as pensions). The model allows representation of annual savings and consumption patterns and of longer-term asset and liability accumulations.

There are other models in the system interacting with these four, including education, energy and agriculture systems, infrastructure, and the environment.

The base case assumes no major paradigm shifts, policy changes or 'black swans'.

What is the 'base case?

The Pardee Center model uses a 'base case' scenario that includes unchanged retirement ages. The IFs base case is a collection of baseline forecasts that, while dynamically interacting, represent a continuation of underlying patterns of socio-political change. Although the base case generally demonstrates continuity with historical patterns, it provides a structure that generates a wide range of non-linear, dynamic, and endogenous forecasts rather than just a simple extrapolation of historical trends.

The base case assumes no major paradigm shifts, policy changes or 'black swans' (very low-probability but high-impact events, such as a global pandemic or a nuclear war). As the base case is built from initial conditions of all historical variables and is periodically analyzed in comparison to many other forecasts, it is a good starting point to carry out scenario analysis and construct alternative future scenarios.

More studies published by Zurich

'Risk Nexus, Income protection gaps: a rising global challenge' provides an in-depth look at the financial issues that might affect workers in 18 countries who face loss of income due to disability and the impact on public, private sectors and households. Published by Zurich and the Smith School of Enterprise and Environment at Oxford University in October 2015.

www.zurich.com/en/knowledge/articles/2015/12/the-global-gap

'Income protection gaps: challenge and opportunities' is a study focused on the results of a survey of over 11,000 people in 11 countries that examines people's attitudes toward coverage to protect income and assets in the case of disability. Based on a study conducted by Zurich and the Smith School of Enterprise and Environment at Oxford University in early 2016.

www.zurich.com/en/knowledge/articles/2016/09/income-protection-gaps-challenge-and-opportunity

'Reducing the risks from rapid demographic change.' By Mathew Burrows, the Atlantic Council, this is a longer study drawing on the Atlantic Council's research and models provided by the Frederick S. Pardee Center for International Futures and Josef Korbel School of International Studies. Sponsored by Zurich Insurance Group.

http://www.atlanticcouncil.org/publications/reports/reducing-the-risks-from-rapid-demographic-change

A study by Zurich Insurance Group and the Smith School of Enterprise and Environment at Oxford University looks at factors influencing demand for income protection insurance. Based on a survey conducted by Zurich and the Smith School of Enterprise and Environment at Oxford University.

www.zurich.com/en/knowledge/articles/2016/10/understanding-ipgaps-report

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Zurich Insurance Company Ltd
Mythenquai 2
8002 Zurich
Switzerland

173002893 (10/16) TCL

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