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Global Agenda Council on Ageing Society

Global Population Ageing: Peril or Promise?

This book is dedicated to the memory of Dr. Robert N. Butler. An early chair of the Global Agenda Council on Ageing Society, Bob inspired us all through his ideas, his optimism, his insights, and his ability to think and work outside of the box. He was a giant in the field, a wonderful colleague, a mentor to many, and a friend to us all. He will be missed but never forgotten.

Suggested Citation: John R. Beard, Simon Biggs, David E. Bloom, Linda P. Fried, Paul Hogan, Alexandre Kalache, and S. Jay Olshansky, eds., Global Population Ageing: Peril or Promise, Geneva: World Economic Forum, 2011.

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Preface

Klaus Schwab

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In a world in which much change is unpredictable and immediate, global ageing – the unprecedented increase in global population over the age of 60 – is a highly foreseeable long-term trend. It is also, of all global issues, one of the most amenable to risk management in terms of identification, measurement and mitigation of possible consequences. Yet, ageing is widely seen as one of the most significant risks to global prosperity in the decades ahead because of its potentially profound economic, social and political implications.

Global ageing, in developed and developing countries alike, will dramatically alter the way that societies and economies work. The issues include how individuals find fulfilment, at what age they retire, and their quality of life once they do retire; how governments devise social contracts to provide financial security; how the older and younger generations interact as they divide up the economic pie; how businesses staff their jobs to compensate in many countries for shrinking workforces; and how health systems respond to the altered needs of those living longer.

If policy-makers and leaders fail to plan adequately for the changes ahead, they will be inundated by the effects of global ageing, such as a dearth of workers, strained pension systems, and overburdened health care systems. But the good news is that if we act now, in a creative and proactive manner, we will have the greatest chance of realizing the potential benefits of the ageing trend – such as utilizing the immense social capital of older people – while avoiding its perils.

The wide range of ramifications makes ageing a topic appropriate for treatment by the Network of Global Agenda Councils. This book is the product of a true collaboration among the business, political, academic, and other leaders of society that make up the Network. Driven by David Bloom, the Chair of the Global Agenda Council on Ageing Society, this book brings together perspectives from multiple stakeholders to provide a broad range of views on the issues for policy-makers, business, and political leaders. The essays examine the interplay between population ageing and many facets of the modern world, such as urbanization, gerontechnology, international migration, and social protection programmes.

Global Population Ageing: Peril or Promise is part of the Council's long-term work on the issue and will provide the background for its activities over the next few years. I am extremely proud of the work undertaken by this Council on this complex issue and look forward to following an informed debate on possible innovative solutions – such as new medical and business models and age-friendly cities – as the Council delves deeper into this new demographic reality.

Foreword

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Director-General
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Populations around the world are rapidly ageing, and it is less developed countries that are experiencing the most dramatic change. This is a cause for celebration. In part, it reflects our successes in dealing with childhood disease, maternal mortality and in helping women achieve control over their own fertility.

However, population ageing will also present both challenges and opportunities. If we do not adapt, it is likely to strain pension and social security systems, increase demand for acute and primary health care, require a larger and better trained health workforce and increase the need for long term care, particularly in dealing with dementia.

But the opportunities are just as large. Older people are a wonderful resource for their families and communities, and in the formal or informal workforce. They are a repository of knowledge. They can help us avoid making the same mistakes again. Indeed, if we can ensure older people live healthier as well as longer lives, if we can make sure that we are stretching life in the middle and not just at the end, these extra years can be as productive as any others. The societies that adapt to this changing demographic can reap a sizeable "longevity dividend", and will have a competitive advantage over those that do not.

But this will not come easily. We first need to change the way we think and the way we do business. We need to discard our stereotypes of what it is to be old. We need to consider the interaction of ageing with other global trends such as technological change, globalization and urbanization. We need to "reinvent" ageing. Above all, we need to be innovative and not simply try to reinvent the past.

People are already questioning our traditional view of older age. A recent survey in the United States showed that it was only a small minority who wanted to retire at the traditional age. Around 80% wanted to continue to participate – but not in the same way. They wanted to work part time or start a new career, or launch a small business. They wanted flexibility.

This is exciting, because if older people can remain active participants in society, they can continue to contribute to our socioeconomic development. Engagement also prevents isolation and loneliness, and ensures their financial security.

At the World Health Organization we see good health as central to this ambition. This is why we have chosen ageing as our theme for World Health Day 2012. I welcome this timely book, which deals with some of the many other perspectives of population ageing. The diverse chapters within it can help us invent the kind of society we might want to be part of in the 21st century.

Introduction

In academic and policy circles, ageing is becoming a hot topic. The media is flush with stories on ageing, and international groups are increasingly singling out ageing for discussion and debate. The World Health Organization (WHO) has dedicated its annual World Health Day in 2012 to ageing. The European Union has designated 2012 as the Year of Active Ageing and Solidarity between Generations. The UN General Assembly held a High-Level Meeting in September 2011 on preventing and controlling non-communicable diseases (NCDs) – a threat to human health and the global economy that is strongly associated with ageing.

These activities build on the framework for Active Ageing established by WHO in 2002 in its report, Active Ageing: A Policy Framework. "Active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age." This framework embraces and emphasizes the value of a "life course perspective that recognizes the important influence of earlier life experiences on the way individuals age."

The WHO framework also defines the multiple determinants of active ageing – from access to health and social services to behavioural, personal, physical and social environments and economic determinants – all influenced by gender and culture. This framework guides the work of the World Economic Forum's Global Agenda Council on Ageing Society and informs this introduction and the essays in this book.

Why is population ageing attracting so much attention now? One reason is that the rapid ageing of humanity is perhaps the most salient and dynamic aspect of modern demography. As a result, its influence on public health and national economies will be dramatic. The world experienced only a modest increase in the share of people aged 60 and over during the past six decades, from 8% to 10%. But in the next four decades, this group is expected to rise to 22% of the total population – a jump from 800 million to 2 billion people (Box 1).

While this ageing trend started in the developed world, it is now a global phenomenon, and it is accelerating, especially in the developing world (Figure 1). In industrial countries, the share of those 60-plus has risen from 12% in 1950 to 22% today and is expected to reach 32% (418 million) by 2050. In developing countries, the share of those 60-plus has risen from 6% in 1950 to 9% today and is expected to reach 20% (1.6 billion) by 2050. The pace of this change means that developing countries will have much briefer periods to adjust and establish the infrastructure and policies necessary to meet the needs of their rapidly shifting demographics. It also means that unlike developed countries, they will need to cope with getting old before they get rich.

The list of countries that have the highest shares of 60-plus populations will change considerably over the next four decades. Although ageing is occurring in every country, the 10 that currently have the highest shares of the 60-plus group are all developed countries, or countries in transition, such as Bulgaria and Croatia (Table 1). The picture will change by 2050 when Cuba makes the list, while some richer countries (Finland and Sweden), leave it. Remarkably, the UN projects that in 2050 there will be 42 countries with higher shares of the 60-plus group than Japan has now, with the fastest ageing mainly in relatively newly industrialized or developing countries (Table 2). In fact, China and Brazil will begin to converge with Japan, which by 2050 will have more than 40% of its population 60 and older, outpacing the increase in the United States (Figure 2).

What are the major drivers of population ageing? Three drivers stand out:

- Declining fertility. The world's total fertility rate – that is, the number of children born per woman – fell from 5 children per woman in 1950 to roughly 2.5 today, and is projected to drop to about 2 by 2050. Most of this decline has occurred in the developing world, where the share of children in the population is expected to drop by half by 2050 from the 1965 level. As families have fewer children, the older-age share of the population naturally increases.
- Increased longevity. Globally, life expectancy increased by two decades since 1950 (from 48 years in 1950 to 1955 to 68 years in 2005 to 2010), and is expected to rise to 75 years by 2050. There are still considerable disparities between the wealthy industrial countries, at 82 years, and the less developed countries, at 74 years. However, this gap has narrowed greatly in the last few decades. The life expectancy of older people has increased particularly rapidly; a person who reaches age 60 has more years of life left than in the past.
- Falls in mortality came before falls in fertility. In the early phases of this transition, large cohorts were born, mainly because mortality, especially among infants and children, tended to decline before fertility fell. Those cohorts are now reaching working ages and the older ages, and their ranks will swell. In developed countries in particular, large-sized post-World War II baby-boom cohorts are reaching the older ages.

Another reason for an emphasis on ageing today is that "doomsday scenarios" abound. These alarmist views typically assume a world of static policy and institutions, continuing trends involving low fertility, and constant age-specific behaviour and labour outcomes. The resulting scenarios yield stark and shocking images of workforce shortages, asset market meltdowns, economic growth slowdowns, the financial collapse of pension and healthcare systems, and mass loneliness and insecurity.

Such tales are strongly reminiscent of the work by Paul Ehrlich and the Club of Rome in the late 1960s, which predicted mass starvation and human misery in the 1970s and 1980s as a result of rapid population growth, or what was termed "the population bomb". But lessons can be learned from this experience. Although the world population did double from 1960 to 2000 (from 3 billion to 6 billion), at the same time per capita income increased by 115%, life expectancy rose by more than 15 years, and literacy shot up as primary school enrolments became nearly universal in many countries.

Food production since the 1940s increased twice as fast as population growth. The message we should draw from this experience is that both change and adaptation are possible and within our control. Some portion will be individual and natural, and some will be collective and political. That said, there will be a number of complicating factors:

- The meaning of ageing is evolving, reflecting the new needs, aspirations and capacities of people now reaching their 60s and 70s.
- Ageing is occurring in a range of settings: wealthy industrial countries have more resources to draw upon in confronting the challenge, though institutional rigidities and vested interests may limit the possibilities for effective action.
- Resources are severely constrained in many countries, and all the more so in the wake of the global financial crisis.
- In the absence of resource transfer schemes that provide support for older people, many developing countries rely on familial support. But that private safety net is fraying as numbers of older people rise, fertility levels fall, perceptions of family ties change, and children migrate from their less mobile parents to cities or distant places for jobs.
- Many in the media perpetuate negative stereotypes of ageing, such as the view that older people are characterized only by loss, decline, decay, pain, suffering and loneliness. These negative and profoundly inaccurate stereotypes influence not only public policy, but also how society thinks about ageing and how older people think about themselves. Moreover, with people living longer than ever before, and in many cases remaining healthy until later years than in the past, society has an opportunity to reap a "longevity dividend", in which older people continue to make substantial contributions for unprecedentedly long periods.

In an historical context, population ageing is one of the most remarkable human success stories of any era, reflecting contributions of public health, medicine, education and economic development. But capturing and unlocking the full benefits of that success require that we adapt our perspectives and reform our institutions. The good news is that there is a wide range of behavioural changes and public policy responses to population ageing that would simultaneously avoid a significant dampening of economic growth and enhance the quality of life for people reaching older ages today and for generations to come.

On the behaviour side, declining fertility and increased educational opportunity have been and will continue to be associated with changing social roles and greater labour force participation by women; and fewer children generally yield healthier, smarter and better-educated younger generations. Insofar as health and intellectual enhancement through education translate into higher adult productivity – all well-established links – lower fertility is tantamount to an increase in the effective labour force, suggesting a further boost to growth. Lower fertility also leads to a decline in youth dependency, which offsets the increase in old age dependency.

In fact, a recent econometric study (referenced in Chapter 6) shows that increases in older-age dependency do not significantly impede the growth of income per capita, unlike increases in youth dependency. These results support the view that the negative impulse that high fertility conveys to economic growth cannot be offset by behavioural and institutional changes, unlike the negative impulse of increased longevity, which can be offset by changes in behaviour and policy.

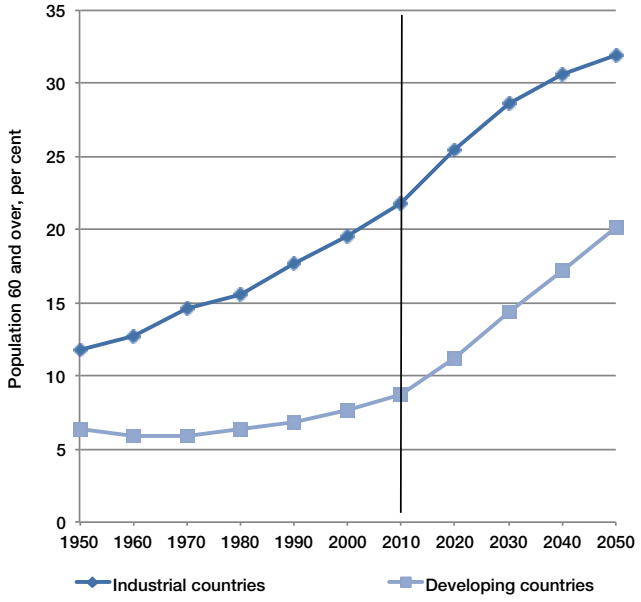
Moreover, when people expect to live longer, they have an incentive to save more for the years after they are no longer working. In economic terms, savings translates into investment, which fuels the accumulation of physical and human capital and technological progress, the classic drivers of economic growth.

Box 1: Key facts on ageing

- At the global level, the share of those 60-plus has risen from only 8% of world population (200 million people) in 1950 to around 11% (760 million) in 2011, with the dramatic increase still ahead as those 60-plus are expected to reach 22% (2 billion) by 2050.
- At the global level, the share of those 80-plus has edged up from 0.6% of world population in 1950 (15 million) to around 1.6% of world population (110 million) in 2011, and is expected to reach 4% (400 million) by 2050.
- The global population is projected to increase 3.7 times from 1950 to 2050, but the number of 60-plus will increase by a factor of nearly 10, and the 80-plus by a factor of 26.
- Between 2010 and 2050 the total population will increase by 2 billion, while the older population will increase by 1.3 billion.
- Women account for about 55% of the 60-plus group, rising to 64% of the 80-plus group, and 82% of the 100-plus group. On average, women outlive men by nearly 4.5 years.

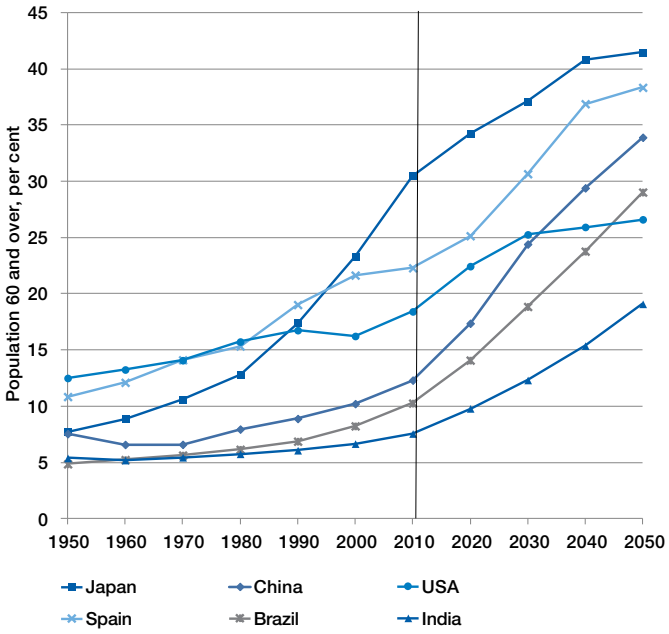
Note: The UN Population Division uses the terms "more developed regions" and "less developed regions", which correspond with "industrial countries" and "developing countries" used in this book.

Figure 1: Ageing is accelerating worldwide



Source: UN, World Population Prospects: The 2010 Revision

Figure 2: Major developing countries will start converging with developed ones



Source: UN, World Population Prospects: The 2010 Revision

Table 1: The top 10 for ageing

Countries with the highest shares of 60+ populations in 2011 and 2050 (percentage), (among countries with 2011 population of 1 million or more)

2011		2050	
Japan	31	Japan	42
Italy	27	Portugal	40
Germany	26	Bosnia and Herzegovina	40
Finland	25	Cuba	39
Sweden	25	Republic of Korea	39
Bulgaria	25	Italy	38
Greece	25	Spain	38
Portugal	24	Singapore	38
Belgium	24	Germany	38
Croatia	24	Switzerland	37

Source: UN, World Population Prospects: The 2010 Revision

Table 2: Developing countries ageing fastest

Countries with largest percentage increase in 60+ share, (among countries with 2011 population of 1 million or more)

2011	Increase, 2011-2050	60+ share, 2050
United Arab Emirates	35	36
Bahrain	29	32
Iran	26	33
Oman	25	29
Singapore	23	38
Republic of Korea	23	39
Viet Nam	22	31
Cuba	22	39
China	21	34
Trinidad and Tobago	21	32

Source: UN, World Population Prospects: The 2010 Revision

A Menu of Policy Responses

It is natural for people to respond to longer lifespans, particularly longer healthy lifespans, by planning on longer working lives and other forms of social contribution. However, public policy has been extremely sluggish in adapting to new demographic realities as most of the world's social security systems create strong incentives for retirement between the ages of 60 and 65. A recent study (referenced in Chapter 6) of 43 countries (about two-thirds of which are industrial) shows that during the 1965 to 2005 period, male life expectancy rose an average of nearly nine years, but the mean legal retirement age rose by less than half a year.

One option currently gaining traction in many countries, such as France, Greece, Ireland and the United Kingdom, is raising the normal legal age of retirement. However, even an increase of a couple years has created some social and political tension, especially given the high rates of unemployment in the wake of the 2008 economic slowdown.

A second option is using international migration to ameliorate the economic effects of population ageing, with youthful poor country populations filling job vacancies in ageing countries. But counterbalancing population ageing in this way requires very large migrant flows that have significant implications for the broader functioning of society. It is not at all clear that the world will capture the large potential benefits of international migration, as most countries have gone in the opposite direction. They have done this by instituting immigration barriers in an effort to protect their economies from low-wage workers, preserve traditions, maintain cultural and ethnic uniformity or respond to anti-immigrant sentiments.

The fact that social protections are not portable across countries creates impediments for increased migration and increases the vulnerability of migrants who, themselves, ultimately become part of the older population. Increased immigration could therefore offset some of the workforce issues posed by population ageing, though not likely a significant portion.

A third option is reforming health systems. An increased emphasis on disease prevention, health promotion and early screening has considerable potential to contain the direct treatment cost and the lost income occasioned by chronic diseases such as cancer, diabetes and cardiovascular disease. New models of long-term care need to be designed and tested. In addition, there is a need to train more healthcare providers, especially in low- and middle-income countries.

The nature of medical training also needs to change. Health providers should be better able to address the multiple and interrelated health conditions specific to the older people who form the bulk of their clientele. Most broadly, health systems need to adopt a life course approach to population health because prevention efforts at all ages promote health in old age.

A fourth option is rethinking business practices. Public policy should encourage, rather than discourage, businesses in the public and private sectors to employ older workers, even part-time. This would involve: (i) catering to older employees' desire for flexible roles and schedules; (ii) investing in worker wellness programmes to enhance attendance and productivity and avoid unnecessary healthcare and turnover costs as the workforce ages; and (iii) taking advantage of the new core business opportunities that will accompany population ageing, such as designing and marketing consumer products and services that are customized to the physical needs, the financial capacities, the interests and the channels of influence that characterize the "silver generation".

Box 2: The rationale for investing public resources in older people

There is a range of powerful social justifications for devoting public resources to the challenges ageing brings:

- Older people are a valuable and productive economic resource that should not be stifled by outmoded public policies such as mandatory retirement or other disincentives to work beyond certain ages.
- Inherent in the challenge of population ageing are huge opportunities, because older people who live healthy lives can continue to be productive for longer than in the past.
- On ethical and humanitarian grounds, devoting resources to older people is arguably the right thing to do, the fair thing to do and a just thing to do.
- Older people have a fundamental human right to make claims on social resources, such as healthcare. These claims are grounded in and justified by international law, for example, in the 1948 Universal Declaration of Human Rights.
- The formation of social capital and societies that are cohesive, peaceful, equitable, and secure requires that we attend to the needs of all groups, especially the most vulnerable, such as older people. Doing so will strengthen societal and cross-generational cohesion.
- Governments have a natural and fundamental role to play in the health sector, for everyone, including older people, because unregulated markets do a poor job of achieving socially desirable and economically efficient levels of health provision. Infectious disease puts communities at risk, health providers can use their informational advantages to exploit health consumers, and problems of moral hazard and adverse selection exist.

Essay Highlights

Against this backdrop, the World Economic Forum's Global Agenda Council on Ageing Society assembled this collection of essays to help inform and stimulate discourse, defuse the perceived threat, and promote a proactive vision for adaptation to support positive population ageing – one that will require forward-thinking frameworks and innovations in technology, education and policy. It is intended for a broad audience: the media, the public, political leaders, public policy-makers, the private sector and specialists seeking to round out their knowledge.

We examine from myriad perspectives how individuals perceive ageing; how society empowers people to live longer, healthier, and more productive and fulfilling lives; and how these realities are affected by the individual and societal construction of the notion of the chronological advancement of age.

The essays also examine the interplay between ageing and many facets of the modern world. Some of these are natural concomitants of the treatment of ageing, such as social protection and human rights. Others, such as urbanization, intergenerational equity, leadership, and the media portrayal of ageing, explore paths that have been less well travelled.In doing so, these essays reflect the key features of country contexts – paying social attention to stage of development and cultural setting, along with the nature and operation of key public and private institutions (such as the health system, extended family, and mechanisms for promoting economic security among older people).

Many of the authors identify options and make recommendations for societal transformations that are necessary or desirable to address the challenges – and capture the potential benefits – of population ageing.

This book consists of 22 essays, divided into four themes: setting the scene, investing in ourselves, pursuing healthy ageing and redesigning our environment. The central theme that emerges is the increasingly urgent need to adapt to population ageing, identify and take advantage of the opportunities it offers, and find ways to unlock the human capital resources that population ageing and our longer lives make available.

Section I: The Backdrop - What We Must Contend with and Why We Must Act Now

The first group of essays paints a picture of the social economic, and political environment that will set the stage for policy decisions on ageing. We see anxious, unprepared societies that are being bombarded by the media with stories about the "burdens" of growing older.

In "The Meaning of Old Age", Laura L. Carstensen and Linda P. Fried note the irony that older people, who throughout history have been portrayed as prophets, saints, tribal leaders and healers, are now often the source of fear and anxiety in discussions on ageing. The problem, they say, is that societies today are "enormously ill-prepared" for populations with more people over 60 than under 15. Cultures are youth-oriented, as are physical and social environments and institutions. The authors contend that if societies are to reap the social capital that older people offer, they need to (i) "modify the life course" (that is, invest throughout life in health, education, and social integration); (ii) improve the care and autonomy of disabled older adults; and (iii) build infrastructure that supports long life and taps the talents and potential contributions of older people who are healthy, such as wisdom and experience.

On the financial front, Jack Ehnes, in "Ageing and Financial (In)security", points out that as people live longer, it is natural for many of them to develop financial security concerns. But these concerns have been ratcheted up sharply in the wake of the global financial crisis, which resulted in trillions of dollars of retirement savings depleted. As a result, he says, there is a "significant questioning of our underlying retirement and savings models, which ultimately bear heavily on the quality of life for seniors, labour market stability, and intergenerational relationships". He calls for an urgent rethinking of official retirement ages and company policies on work after retirement in developed countries. And he cautions that Asian countries "lack the institutionalized pension schemes to fill in the gaps from the weakened informal family–based support mechanisms".

Wasted social capital and financial insecurity feature especially strongly among older women, who tend to have a lower standard of living than older men, we learn in "Women and Ageing" by Saadia Zahidi. Why is this so? The author suggests that in developed and developing countries "current societal arrangements cumulatively result in a lifetime of unequal and inadequate access to education and economic participation and opportunity for women". To remedy this situation, she recommends policies and practices that protect and empower these women, such as access to quality education and removing barriers to women's access to economic activity. Also needed are (i) policies and practices that catch women "upstream", before they get old; (ii) the application of a gender lens to existing and new measures affecting older people to ensure women are not overlooked; and (iii) policies and products focused on older women's needs and interests.

Complicating matters, the media (news, television and film) and advertising often convey images of older people through a "lens of decline and diminished value", according to Colin Milner, Kay Van Norman, and Jenifer Milner in "The Media's Portrayal of Ageing". This tactic, they say, confirms beliefs and entrenches negative stereotypes, in turn affecting how older people see themselves and how society views and treats them. What is needed now are realistic portrayals "so depictions encompass the many different experiences of ageing without attaching a value judgement". How can the media and advertising reshape perceptions of ageing? The authors suggest that one way would be to show the financial benefit, that is, the value of creating marketing messages that resonate with older customers.

How should we think about equity across adjacent (as opposed to distant) generations? In "Ageing and Intergenerational Equity", Norman Daniels explains that with global ageing comes a sharpening of the problem of intergenerational equity. Developed countries worry that they can no longer afford transfers to the elderly that were part of a social contract over many decades. However, developing countries – with even fewer resources – do not even have such resource transfer schemes in place. Daniels discusses the Prudential Lifespan Account as a framework for thinking about resource allocation over the lifespan that aims to be fair to all age groups, even if they are treated differently at different stages of life.

Section II: Investing in Ourselves – How to Release Social Capital

The second group of essays looks at innovative ways to tap the valuable social capital that older people offer. The emphasis is on engaging older workers in fruitful activities, whether through flexible retirement policies, age-friendly cultures and working places, lifelong learning, or redesigned pensions and healthcare systems.

In "Population Ageing: Macro Challenges and Policy Responses", David E. Bloom, Axel Börsch-Supan, Patrick McGee and Atsushi Seike note that because of high past fertility rates there has been little need for rapid policy changes so far, but this will change as baby boomers retire, labour force growth slows, and the costs of pension and healthcare systems rise – especially in Europe, North America and Japan. To adapt and possibly benefit from population ageing, the authors urge public policy-makers to (i) allow greater choice on retirement timing; (ii) undertake pension reform; (iii) re-design healthcare financing systems with older people in mind; and (iv) be open to migration of working-age people. The authors also call on businesses to alter attitudes towards older workers and to change practices in a number of areas, such as work schedules and routines, training, healthcare, and pay systems – with the emphasis on being proactive rather than reactive.

An important way to move forward, say Simon Biggs, Laura Carstensen and Paul Hogan in "Social Capital, Lifelong Learning and Social Innovation", is to recognize older people's social capital, which is often obscured by overly negative views of ageing that result in underutilized talent and misperceptions about abilities. They contend that despite normal age-related decline in some aspects of functioning, in the absence of dementia or serious illness, age-related changes do not prevent people from making substantial contributions to workplaces, families and communities. Older people typically have accrued social and process skills that are particularly useful for service economies. To release social capital, they advocate a virtuous cycle of lifelong learning (updated skills); social adaptation (age-friendly cultures and working environments); and social innovation (activities arising from newly identified potential).

In "Leadership: The Elders", S. Jay Olshansky describes a small group of highly distinguished older people formed in 2007 to help resolve global issues and ease suffering. Over time, the group – known as The Elders – has included Graça Machel, Desmond Tutu, Marti Ahtisaari, Kofi Annan, Ela Bhatt, Lakhdar Brahimi, Gro Brundtland, Fernando Cardoso, Jimmy Carter, Nelson Mandela, Mary Robinson, Aung San Suu Kyi, and Muhammad Yunus. So far, The Elders have successfully addressed many world problems, but the group is equally important as an example of how older people can make vital contributions to society, in part, because they are older. Leadership is just one of many attributes that highlight the need to portray ageing as a period of constant adaptation and transitional phases that can lead to rewards for individuals and societies.

At the business level, in "Organizational Adaptation and Human Resource Needs for an Ageing Population", Atsushi Seike, Simon Biggs, and Leisa Sargent contend that in a society with fewer younger people relative to mature workers, an organization's ability to succeed may hinge on whether it can attract and retain mature workers. At the policy (macro) level, it is vital to establish employment conditions and compensation terms that make it desirable to keep working. At the workplace (mezzo) and personal (micro) levels, the key is age-friendly working environments. Such environments include flexible working practices (career breaks, part-time work and flexi-place working), health and well-being promotion (supervised fitness programmes), and continuous learning (updating skills). These initiatives would help promote cultural adaptation to an ageing society.

This theme is echoed in "Ageing Workforces and Competitiveness: A European Perspective", by Giles Archibald and Raymond Brood, who call for a new corporate model to unlock the social capital in healthy, older populations. If this is not done, they argue, the demographic profile of Western countries is likely to be a significant hindrance to economic growth. How can business respond? One way is to hold on to current workers, but adopt more flexible pay practices. This would enable older workers to reduce responsibilities, but with commensurate smaller compensation. Another way is to provide more flexibility in the work-life-care balance. But whatever is done, the key is to plan ahead and act now. For example, both 3M Europe and Lanxess (Germany), have begun developing new human capital planning models to find ways to maintain productive workforces as the average age rises.

Section III: Pursuing Healthy Ageing – What Healthy Ageing Involves

The third group of essays focuses on ways that we can arrive at old age healthier, whether by investing in preventive care throughout the life course, modernizing medical education, effectively managing advanced illness and NCDs, or even delaying the biological process. While we know many people are living longer, evidence that they are also living healthier is somewhat thin and still preliminary. Widening and deepening this evidence base is a high priority because if people can retain their health as they age, it is easier for them to remain socially connected and participate actively in the workforce. In the coming decades, a significantly greater number of employees, especially those not doing manual labour, may be able to work productively into much later ages than they do today.

In "The Longevity Dividend: Health as an Investment", S. Jay Olshansky, John R. Beard and Axel Börsch-Supan advocate investing in health to live better, not just longer. If we can achieve that, society can get a healthy return in longer working lives; lower healthcare outlays; and social, economic, and health dividends. In fact, the authors say, "the economic value of a rapidly growing healthy older population is so large that healthy ageing should be aggressively pursued, on its own merits, as a societal investment". How should this dividend be pursued? The authors say that first, we need to invest in health throughout the life course, so that people are healthier when they reach older ages. Second, we need to better understand the biology of the ageing process, in the hopes of delaying the infirmities of old age and further compressing the morbid years at the end of life.

For developed countries, Linda Fried, Paul Hogan and Jack Rowe argue in "Design and Operation of Health Systems in Wealthy Industrial Countries" that it is time to redesign our health systems to better handle the altered healthcare and prevention needs that come with living longer. The authors advocate (i) re-engineering the 20th-century medical model, with a stronger focus on prevention throughout the life course; (ii) doing a better job of educating health professionals on geriatrics; (iii) creating a strong partnership between the government and the corporate sector on shared goals and aligned implementation; and (iv) facilitating the transfer of best practices to developing nations. The goal, they say, is "a decreased burden of disease and a successful compression of morbidity in the latest points in the human lifespan", which should lower healthcare costs and "amplify the benefits to society of being an ageing world".

Developing countries, however, will have to cope with population ageing and the associated burden of chronic disease before they reach high income levels, as pointed out by David E. Bloom, Ajay S. Mahal, and Larry Rosenberg in "Design and Operation of Health Systems in Developing Countries". They warn that a business-as-usual approach could lead to an inadequate healthcare supply, out-of-date healthcare systems, insufficient human resources for health and greater health inequality. But this bleak outcome can be avoided with a proactive and innovative approach that takes advantage of these countries' socio-economic development. Top priorities include primary prevention efforts aimed at reducing the incidence of NCDs; reform of healthcare worker training to focus on NCD prevention, early detection, treatment and care; creation of social health insurance programmes; and development of the primary healthcare sector.

One region that would benefit greatly from investing in older people is Africa, which on the face of it seems the least likely to fall into that category given that it is home to the world's youngest population. In "Ageing Africa: Opportunities for Development", Isabella Aboderin tells us that by the year 2100, Africa's older population will explode to 716 million from 56 million today, the sharpest increase for any region. The reality, she says, is that investing in older people offers Africa a way to realize key development goals, such as raising agricultural productivity and sustainability, providing more jobs, and enhancing equity and stability. Policy options, especially for older people who are poor, include (i) social pension programmes and stronger support for informal, family-based support systems; (ii) better access to healthcare; (iii) greater access to agricultural extension services; and (iv) intergenerational knowledge transfer.

What role does medical education play? In "Modern Medical Education", Daniel Ryan and John Wilden suggest it is time to refocus medical education by shaping a future medical workforce of doctors and nurses designed to meet the needs of an older population. Many older people have multiple chronic diseases, such as hypertension, diabetes and heart failure, in addition to functional difficulties, such as incontinence and cognitive impairments. Yet, the emphasis of medical education is towards greater specialization, raising concerns over the number of doctors able to adopt a multidisciplinary and geriatric knowledge approach. Can this deficit be addressed through training and investment? The authors say yes, but that it will require a seismic shift in priorities that will take many years to achieve.

On the cost front, can we afford an ageing population? In "The Challenge of Non-Communicable Diseases and Geriatric Conditions", Ron Williams and Randall Krakauer contend that as long as populations age and health technology advances, the cost of healthcare will rise. In 2007, total US health outlays stood at 15.7% of GDP, about double the world average of 8.6%. The authors say there will be many opportunities to reduce the rate of increase of healthcare costs by intelligently manipulating the economic levers of healthcare. Which levers should we focus on? One is the effective management of NCDs, which account for the lion's share of medical costs for older people. Another is the effective management of advanced and terminal illnesses. A third is a more collaborative, coordinated and integrated healthcare system – from caregivers and clinicians, to facilities to health plans. This would include collaboration among those who provide care and those who finance it to develop a set of incentives that appropriately align rewards with effective and efficient patient care.

Section IV: Redesigning our Environment – What a Better World Might Look Like

The final group of essays explores what an age-friendly world might look like. One vision involves greater social protection for older people, greater clarity and respect for their rights, better financial education, easier labour mobility across borders, age-friendly cities, and robots and other technologies to assist them.

In "Social Protection of Older People", David E. Bloom, Emmanuel Jimenez, and Larry Rosenberg explain that despite the growth and extent of social protection programmes in rich and poor countries alike, older people remain extremely vulnerable. These programmes typically include pensions, basic healthcare, child benefits, and social assistance and employment plans but the coverage gaps especially in the poorer countries, are huge. What can be done to fix the problem? First, gather the evidence that there is a problem. This means developing a comprehensive information system about the financial, physical and social situation of older people. Second, mobilize a consensus on the need for including older people in national social protection – perhaps do a "stress test" to assess their coverage – and devise a strategy. Third, mobilize domestic resources. Fourth, seek help from the international community.

What about the rights of older people? In "Human Rights in Older Age", Alexandre Kalache and Richard Blewitt argue that older people should enjoy the same intrinsic rights as everyone else. In reality, however, ageism (the stereotyping and prejudice against older people) and age discrimination (the use of age as a reason to treat individuals negatively) is prevalent worldwide. Ageism and age discrimination range from limited access to services, education, and job opportunities to abuse, neglect and abandonment. National laws against age discrimination exist in some countries, but they typically focus on jobs. At the international level, following the 1948 Universal Declaration of Human Rights, UN conventions on the rights of children, women, indigenous populations, ethnic minorities, immigrants and disabled persons have been adopted. Is further action required on behalf of older people? The authors contend that a gradual consensus is emerging on the need for strengthening older persons' rights within the framework of international law.

With an ever increasing share of the world's population residing in cities, in "Ageing and Urbanization", John Beard, Alex Kalache, Mario Delgado and Terry Hill ask whether cities can be redesigned to foster more active and healthier ageing. Many such initiatives are under way. They are focused on needs related to participation (access to information, accessible buildings and public transportation), health (accessible and affordable healthcare services and opportunities to be physically active), continuing education (models of lifelong learning), and security (affordable housing and services; and home, community and transportation safety). An indication of the rapid uptake of these ideas globally is the WHO's Global Network of Age-Friendly Cities, which now counts over 400 affiliated members from large cities such as New York to small rural communities in Australia. Fortunately, the authors say, the experience of these municipalities is that "many of the features advocated by the age-friendly cities movement are low cost".

In "International Migration and Population Ageing", Hania Zlotnik explores whether international migration can provide a solution to labour shortages created by population ageing. It is true, she says, that dynamic economies can rely on migrants to satisfy their labour needs. But what most researchers have found over the past few decades is that demography, which has a long gestation and takes a long time to play itself out, is not the main driver of international migration. Rather, it is factors such as economic and political developments in both the countries of destination and origin. The general conclusion, she notes, is that it would be difficult, politically, socially and even in terms of the management of international migration, to admit continuously and over a long period the relatively high numbers of migrants of particular ages that would be required to counterbalance in a significant way the ongoing population ageing.

In "Financial Education and Older Adults", Andre Laboul advocates better financial education and awareness for older people. The reason is that older people are being asked to cope with a financial landscape that increasingly transfers financial risks to individuals and features ever more sophisticated financial products at a time of great uncertainty. Yet older people, along with many others, are ill equipped to handle these responsibilities and often overestimate their financial skills and awareness. Given that pensions and retirement savings plans are vital for individual and social welfare, they should be a top priority. The education should occur early on, when proactive action is still possible – savings must be built up over a long period of time – but it is also needed in the phase out period, as assets are being drawn down. In addition, stronger financial consumer protection is essential to protect older people from financial abuse.

Finally, is there any chance of helpful robots? In "Technology and Ageing", Gerald C. Davison and Aaron Hagedron bring us up to speed on gerontechnology, which involves designing products and services to help older people with limited physical or cognitive abilities live more independent lives. We now have "smart homes", tele-health, m-health (mobile phone-based monitoring), assistive technology (such as a foot orthotic that improves balance) and socially assistive robots for rehabilitation or for behavioural treatment of dementia symptoms. The authors stress that "perhaps the most important, but currently overlooked opportunity" for gerontechnology lies in developing countries, which need basic assistive devices that are more appropriate for a less developed environment and new technology that can cheaply ensure access to diagnostics in remote areas.

Conclusions and Recommendations

The success story of population ageing and longer lives is often accompanied, in the end, by tales of doom and gloom; but it is vital that the global community not succumb. Although there are serious challenges, which must be weighed, understood, and in some cases adapted to, there are also enormous opportunities that must be seized. The essays in this book do not point to the existence of a magic bullet or uniform plan. We will need to customize responses to different countries' social, economic, and political systems and histories. Even so, some general principles of change stand out because of their broad applicability and pragmatic nature.

- Committing at the highest levels. History teaches us that big and complex issues need high-level champions. As we saw with HIV/AIDS, it took public pronouncements from French President Jacques Chirac in 1997 and US President George W. Bush in 2003 to mobilize enormous resources and energy to battle the disease, even though HIV had been discovered and identified as the cause of AIDS in 1981. In the case of ageing, a commitment to an age-friendly society must come from the top, given that policy responses include raising the retirement age, reformed health systems and encouragement for businesses to rethink practices. In addition, councils of distinguished older people, which enjoy a moral authority, should embrace the cause and spread the word to broaden commitment.
- Acting early and swiftly. We cannot wait for a crisis to act. One reason is that many of the policy responses – such as a new medical curriculum that focuses more on prevention and chronic diseases and less on ever-greater specialization – require a long lead time to design and implement. Another reason is that good options may evaporate as constituencies shift, making gradual responses more difficult. For example, it would be fairer to give workers a decade of lead time to plan their retirement rather than informing them as they prepare to retire in a year or two that they must work longer. Moreover, it will be harder to convince workers to back higher retirement ages as they themselves form a bigger share of the affected population.
- Embracing the new reality of ageing. Individually and collectively, we must change our behaviour, institutions and public policies to reflect the new meaning of ageing, and along with it, the altered needs and capacities of older people (Box 3). This means raising the legal retirement age (though this change may focus primarily on those not predominantly engaged in manual labour), investing in older people so that they can continue to learn and contribute to society, rethinking business practices (such as work schedules) to facilitate the participation of older workers, making sure that there are adequate social protections (such as pensions), and reforming health systems to better meet the needs of older people. It also means investing in health throughout the life course so that people are healthier when they get older.
- Acting on all levels. Pragmatism dictates that we start on the path of social, economic, and political change at all levels – local, national and global. Urban design is a local issue. The legal retirement age is a national issue. The concept of human rights for older people is an international issue. And migration is a bilateral and multilateral issue.
- Better use of existing resources. There is considerable scope to use our resources more effectively. This entails everything from the design of age-friendly cities and assistive robots, to health systems that place greater emphasis on disease prevention and early screening. It also entails holistic life course policies such as enabling older people to acquire financial planning skills and the ability to update their workplace skills.
- Sharing best practices. In demographic terms, the challenge of population ageing is historically unprecedented, which means that we should conduct and learn from a multiplicity of experiments in developed and developing nations. These would include:
  - The Dutch city of Eindhoven's pioneering efforts to become a zero-emission community (with the world's most interactive urban lighting system) and a healthy city in which citizens have the latest technologies at their disposal to maintain a high quality of life even when suffering from chronic diseases
  - Shanghai's ambitious urban policy, which will see the creation of widespread and accessible community centres for older residents
  - Efforts by the Andalusian province (Spain), the State of São Paulo (Brazil), and the State of South Australia to broaden city concerns to the state level, given that many aspects of urban living that affect the quality of life of older people go beyond municipal boundaries (such as housing policies, public transportation, access to health and social services, and recreational facilities).
- Developing new indicators. We should develop a set of indicators for assessing the financial, physical and social situation of older people and the age-friendliness of various environments. We should then use the media to hold key stakeholders (individuals, governments, business and civil society) accountable for progress in this realm. Besides the WHO's guidelines on age-friendly cities, this would include studies on the quality of life, health status, economic and physical security, and vulnerability to crime. It would help policy-makers determine whether older people are falling through the cracks – such as not tapping available medical benefits – when simple measures (such as free bus passes, transportation to clinics, or help in filling out forms) might solve the problem.
- Taking advantage of new technology. It is vital that that we tap new technology to improve the quality and accessibility of healthcare for older people. In developed countries, "smart homes" integrate a range of monitoring and supportive devices to help people age in place more effectively (for example, wireless sensors connected to small computers can detect functional decline). Social robots can assist in vital activities, such as reminding people about eating and taking medicine. And telemedicine enables a patient to connect with clinicians to better manage chronic diseases at home rather than in a hospital.

The supreme goal is to make sure we understand and tackle tomorrow's challenges, not yesterday's, and in the process, ensure that generations reaching older ages now and in the future are allowed to experience and express their full potential.

Box 3: Opportunities arising from a longer, healthier life

A longer and more flexible working life. During a period when the number of people of traditional working age is shrinking, mature-age workers become a valuable resource, so much so that the balance will change in favour of practices that promote higher levels of labour force participation among older individuals.

Volunteering and community contributions. While research on the uptake of voluntary activities is mixed, there is little doubt that many older adults make a valuable contribution through voluntary community engagement. This may take the form of civic engagement, from education and healthcare to the environment and homelessness.

Enhanced social skills. Research shows that many older adults are better at interpersonal communication and less prone to immediate emotional reactions than persons of a younger age. This is a set of "people skills" that would be particularly valuable for a service-based economy.

Redesigned environments. Creating age-friendly environments not only enhances the social participation of older adults and other groups, but it also stimulates business innovation in designing the built environment. New building and retrofitting gives rise to employment opportunities in construction, transport and related industries.

New markets, new consumers. It is estimated that people over the age of 60 hold more than 50% of the wealth in developed societies, with a similar trend occurring in emerging countries. This means that the considerable potential of the "silver market" is only just beginning to be tapped.

Intergenerational transfers. Contrary to the view that older generations are a burden on younger ones, most transfers run down the generational tree rather than up it, when viewed across the life course. Parents and grandparents give their children the best start in life they can. Older taxpayers show no indication of refusing to pay for large infrastructural projects for which they may never reap the full personal benefit. It may be more accurate to talk about generational altruism rather than generational burdens.

Caring and family cohesion. Older people, particularly women, engage in unpaid care work. This contribution not only frees up others in the workforce, such as their adult children, it currently saves their national economies considerable costs. When a shrinking population of working age is combined with increased female participation, certain sectors – such as the aged-care workforce – will come under particular strain unless these skills are recognized.

Acknowledgements

This book is a product of the World Economic Forum's Global Agenda Council (GAC) on Ageing Society. It was prepared under the editorial leadership of John Beard, Simon Biggs, David Bloom (GAC Chair and lead editor), Linda Fried, Paul Hogan, Alexandre Kalache and Jay Olshansky. The GAC members are grateful to the World Economic Forum's Michael Hanley (Editorial Director), Patrick McGee (Manager of the Council), and Tiffany Misrahi for thoughtful suggestions and strong support, and to Fabienne Stassen Fleming for editorial assistance. We are appreciative of the patience and help of Kamal Kimaoui and Yoren Geromin in the typesetting and production. We would like to thank Martina Gmür (Senior Director, Head of the Global Agenda Councils) for her encouragement of this project. The GAC members would also to thank the book editors, Dianna Rienstra, David Watkiss and Alejandro Reyes, and proofreaders Mary Bridges, Mary McGee and Ryan Jacobs. The Global Agenda Council on Ageing is also grateful to Marija Ozolins, Larry Rosenberg and Laura Wallace for their assistance in the editing and preparation of the Introduction and the overall book.

Support for David Bloom's participation in this work was provided by the Program on the Global Demography of Aging at Harvard University, funded by Award Number P30AG024409 from the National Institute on Aging. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Aging or the National Institutes of Health.

I. The Backdrop: What we must contend with and why we must act now

Chapter 1
The Meaning of Old Age

Laura L. Carstensen and Linda P. Fried

Even at the beginning of recorded history, a handful of people survived to old age. Many of those who did served important functions in societies. Elders featured in religious texts, mythology and lore have been portrayed as prophets, saints, tribal leaders and healers, providing cultural continuity, wisdom and concern for the common good. Thus, there is a twist of irony in the fear and anxiety that characterizes contemporary national and international discussions about anticipated coming hardships imposed by ageing societies.

But a preparatory state aimed solely at bracing for a crisis presents more than irony. It ensures that the crisis will arrive. If we are to realize the potential opportunities older populations offer, we must appreciate how ageing individuals construct meaning in their lives and the social context that surrounds specific cohorts' collective understanding of ageing. We must also actively begin to build infrastructure, norms and policies that exploit the potential contributions older people can make to societies.[1]

It is not the case that life has suddenly been extended beyond a point where people can live healthy, productive lives. Indeed, there is no reason to believe that the human life span – the length of time the species can live – has changed much, if at all, throughout evolutionary history. Until the 20th century, on average, lives were short. Fewer than half of those born reached 50 years of age. What has changed is the sheer number and proportion of each birth cohort that now routinely live into their 80s, 90s and 100s.

In less developed regions of the world, life expectancies remain far shorter; however, societies there, too, are beginning to live longer and age rapidly. Within a decade they will be on demographic trajectories that will reshape the distribution of age in every country in the world. The profound and global phenomenon driven by ageing will transform all aspects of life.

Will these changes be for better or for worse? Will such demographic shifts inevitably burden economies, or offer unparalleled benefits? Will older people consume resources that would otherwise go to children? Or will older people become the resource children and societies in general so badly need?

We maintain that if we play our cards right, prolonged lives can allow us to redesign them in ways that improve quality at all ages and across generations. The gift of time we received from our ancestors in the 20th century presents us with unprecedented opportunities. To be sure, these opportunities will be missed if we do not begin to prepare for them. The real challenge, as we see it, is only partly about finding ways to care for dependent elderly. Ageing societies will succeed or fail largely as a function of the new meanings we ascribe to both healthy and unhealthy longer lives.

A Cultural Problem

Population ageing presents a cultural problem.[2] The dramatic increase in the numbers of people who are making it to their 80s, 90s and beyond is generating a profound mismatch between the cultural norms that guide us through life and the length of our lives.[3] Humans are creatures of culture. We look to culture to tell us when to get an education, marry, start families, work and retire.

Because life expectancy has increased so quickly, we are still immersed in cultures designed for lives half as long as the ones we are living. The life course itself is a cultural construction. Two hundred years ago, human development did not include a distinct stage of life called "adolescence". There was no more significance afforded to 65 than 55 or 45 years of age. We must ask the question: How can societies and individuals profit from old age?

Yet to approach the topic of population ageing with rose-coloured glasses, overlooking the real vulnerabilities associated with advancing age, would be foolhardy. Societies today are enormously ill prepared for populations in which there are more people over 60 than under 15. Not only are cultures youth-oriented in the popular sense of favouring the young, but physical and social environments and institutions are quite literally built by and for young populations. The implicit users of staircases, automobiles, telephones, furniture, parks, highways, train stations, airports and housing are young people. Workplaces and working lives – and even most hospitals – are tailored to those with considerable endurance.

Medical science, a key part of culture, has focused on cures for acute diseases far more than prevention of the chronic diseases that unfold over years and decades. Expectations of workers include speed, agility and facility with new learning. Further, many societal roles were designed when life expectancy was 47 and without the knowledge of the unique capabilities that older adults could bring to the workplace and society. Though ageism is often invoked as the reason for the focus on youth, and though it may play a role, we live in a world that only recently included large numbers of older adults.

Age-Related Changes in Biological Systems

Worlds built for the young are often difficult for the old to navigate. Normal ageing brings with it myriad changes, many of which are unwelcome. Slowing is a key hallmark of ageing. The effects are ubiquitous. People move more slowly, metabolize toxins over longer time courses. Feeling stiff and sore when you wake in the mornings, recovering from injuries and illness more slowly, straining to hear a conversation, reflect "typical" age-related changes. Difficulty retrieving the name of a person you know well, forgetting why you walked downstairs as you find yourself at the bottom of a staircase, drifting off as you read the morning paper all represent real consequences of age-related changes in biological systems.

Towards the end of life, disease and disability are typical. Thus, older societies have greater morbidity and more functional limitations than younger populations. There is a diminution of physical reserves, culminating for many, at the end of life, in the onset of frailty, a medical syndrome of decreased reserves and resilience, and – for some – disability and loss of independence.[4,5] Even those who escape frailty experience diminished resilience and reserves as they get older.

Gains Come with Age

The vulnerabilities of ageing must not be overlooked when planning for ageing societies. Importantly, however, just as sure as there is loss, there are gains that come with age. The gains have been largely overlooked. Paul and Margaret Baltes,[6] professors of lifespan development, wrote compellingly about the need to recognize the gains and losses inherent in all developmental stages. Young people, for example, may be fast and agile, but they lack experience and knowledge. Their futures demand that they focus on their own personal advancement more than the broader community. The impressive physical resilience in the young is not matched by emotional resilience, which comes much later in life. We do not populate the state and federal courts with 20-year-olds, despite their cognitive agility.

In fact, though historically most of the literature on cognitive ageing has focused on deficiencies, there is growing literature pointing to unique strengths of older adults. As noted above, normal ageing is associated with slowed cognitive processing, memory impairment and difficulty concentrating. Barring dementia, however, knowledge continues to grow. Especially in areas of expertise, practice compensates well for declines in processing efficiency.[7] Experts – whether musicians, chess players or scientists – often reach peaks in their advanced years.[8]

Even in the general population, vocabularies are larger and knowledge about the world is greater in the old as compared to the young. Recent findings suggest that older people are more likely to change attitudes in light of new information,[9] and they appear better able to take the perspective of younger people than younger people are able to adopt perspectives of the old.[10]

Presented with cultural and economic disputes over resources, older people generate more even-handed and acceptable solutions than younger counterparts.[11] Indeed, there is intriguing evidence that there may be potential upsides even to deficits, like distractibility. Lynn Hasher and her colleagues recently demonstrated that unsuppressed extraneous information in one situation often becomes relevant and is utilized by older adults when solving problems that later arise. In elegant experiments, she showed that older people gain advantages from access to extraneous information downstream; younger people do not.[12]

In everyday life, this can be associated with creative problem solving that emerges at older ages. Especially in emotionally charged situations, older people tend to generate more effective solutions.[13] In addition, emotional experience and emotional balance improve with age. Older people have lower rates of clinical depression, anxiety and substance abuse.[14] They regulate their emotions better, avoiding extreme highs and lows.[15] In other words, while ageing is associated with declines in some aspects of cognitive processing, age-related gains also come with age. Greater understanding of the world coupled with emotional balance and improved perspective is, for many, the definition of wisdom.[16]

Importantly, ageing trajectories also vary wildly across individuals. Scientists have documented considerable variability in older people in physical, social, emotional and cognitive capacity. This observation is important for at least two reasons. For one, variability speaks against inevitability. It suggests that ageing per se is not the culprit when negative outcomes arise. Second, variability is far from a random process. It is important to emphasize that, in developed countries such as the United States, only a fraction of adults 65 and older are frail (7% to 10% of those in any given community), disabled (20% or less with difficulty or dependency in managing households and/or basic self care, although half may have some difficulty walking), or in need of long-term care (5% to 10%).[17]

Individuals who are educated and affluent have less functional disability and live longer than those who are disadvantaged in society. Not surprisingly, individuals who exercise regularly are more physically fit than those who do not, and they also show less cognitive decline– into the oldest ages. Although age is a powerful predictor of length of life, in adulthood, education is even better.[18]

Understanding Variability

From a societal perspective, variability means that age-based policies, programmes, beliefs, and communities are inherently problematic. People in their late 60s who are extremely sick, possibly facing the end of their lives, have more in common with 80-year-olds in the same physical state than with healthy counterparts at either age. Discussions about older workers often draw on literature about cognitive decline in the very old when they should be comparing 55- to 65-year-olds with 65- to 75-year-olds, where differences are far smaller and sometimes non-existent.

Frailty is far more frequent among the very old than the young old. Again, social class and its correlations place people on very different ageing trajectories. Thus, forward-thinking societies should plan for older populations that are heterogeneous and develop plans to help those who need it, while tapping the resources of those who can contribute. Without doubt, the category of “old age” will be parsed into multiple stages, just as adolescence was carved out as a special transitional stage into adulthood.

Because of the magnitude of the demographic shifts underway, ageing will inevitably have profound implications for entire societies. Societies top heavy with frail, dependent and disengaged people with relatively few younger people to support them will endure many hardships. We maintain, however, that societies top heavy with experienced citizens will have a resource never before available to our ancestors: large numbers of people with considerable knowledge, emotional evenness, practical talents, creative problem-solving ability, commitment to future generations, and the motivation to use their abilities can improve societies in ways never before possible.

Understanding the Meaning of Age

The meaning of age will continue to be a fluid concept and will be constructed through complex and iterative processes for decades, if not centuries, to come. As the odds of reaching advanced old age increase around the globe, people will gradually come to extend their individual time horizons and engage in more philosophical thinking about the meaning of lives that last far longer than ever imagined by our ancestors.[19]

In Europe and the United States, because of their numbers, baby boomers will transform the culture of ageing. Because boomers came of age during an historic era of considerable progress in gender and race equality, they tend to view themselves as rebellious and "youthful" despite their advancing age. The birth cohorts comprising the boomers identify more strongly with younger generations than older ones and blur long-standing lines that mark age.[20]

Future generations will continue to write and rewrite the meaning and purpose of advanced stages of life. Societies that find ways to collectively advance new meanings of life that utilize all of their citizens will prosper far more than ones in which social structures constrain contributions. To the extent that societies actively build cultural infrastructures that take advantage of new possibilities, they will realize many opportunities and benefits. To fail to do so would represent a tragic squandering of this gift of life.

Conclusion

As we stand at the beginning of the 21st century, there is a tension between advocates for the elderly and others with concerns about the inability to provide seemingly limitless support. In the United States now that more than half of the federal budget is allocated to care for older people, it makes sense to worry about other societal needs.

We argue for a three-pronged approach:

- First, it is essential that we think programmatically about investments throughout life in health, education and social integration that pay off at all ages. Just as early investments in health and early education paid off with huge reductions in premature death and early morbidity a century ago, we must now conceive of lifelong investments that will produce healthy and engaged populations at all ages, especially among all future cohorts of older persons.
- Second, we must improve the care and autonomy of disabled older adults; in part for their own quality of life and in part because only at its extremes does disability render people completely dependent. To the extent that those who have functional disabilities still have access to opportunities to contribute, we believe that there is reason to predict that contributions will continue.
- Finally, but arguably most importantly, we must build infrastructures that tap the real talents and potential contributions that healthy older people can make to societies. We must get rid of mixed messages about working and replace them with calls for all able citizens to contribute to the welfare of societies.

Population ageing will transform the global community. The question is whether such changes will improve societies or extract net tolls. Either is possible. If we continue to view the life course as our ancestors did and simply tack added years on at the end, we face sure calamity. If instead we begin to modify the life course and build infrastructures that support long life, societies can begin to utilize the strengths of older people and support the real vulnerabilities advanced age brings.

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Chapter 2
Ageing and Financial (In) Security

Jack Ehnes

The impending flood of baby boomers entering retirement, the unsettled landscape for retiree healthcare, and the fears of creating burdens of mounting debt for generations to come have framed the financial landscape in recent years. Although elements of similar dynamics can be recognized in other economies, the policy debate is most apparent in the United States. As an important benchmark in assessing worker confidence, the 2011 Retirement Confidence Survey found that 22% of workers are not at all confident about having a comfortable retirement.[1] This is the highest level of workers' insecurity in the 21 years the survey has been conducted. Gallup Poll data indicates that 63% of Americans now expect to work part-time after retirement, and they are twice as likely to say, "It's out of necessity".[2]

The concerns for retirement security from an enlarging ageing population are running into the headwinds of pension reform, which has placed an increased burden on personal savings. Throughout the Organisation for Economic Co-operation and Development (OECD) countries, systematic reforms are being contemplated, with changes ranging from lengthening the pension retirement age to lowering pension benefit entitlements. Within the OECD, "30 countries have made at least some changes … and 16 have made major reforms that will significantly affect future benefits".[3] While developed nations struggle with their financial obligations to retirees, Asian countries bear many of the same demographic trends, but lack the institutionalized pension schemes to fill in the gaps from weakened family-based informal support mechanisms.[4]

A Profound Impact on Financial Security

The demographic repercussions of a growing ageing population will have a profound impact on financial security. As life expectancy increases, natural strains on the sustainability of financial security increase. This growing economic tension would be difficult to manage on its own, but the economic recession of 2008 has recast this problem severely. The depletion of trillions of dollars of retirement savings globally has caused a significant questioning of our underlying retirement and savings models, and ultimately bears heavily on the quality of life of seniors, labour market stability and intergenerational relationships.

The recent economic downtown has sharply decreased retirement savings in workers' traditional and defined-contributions accounts, and also has damaged the equity in their homes. For many workers with limited savings, home equity has served as an important component of retirement savings.[5] A recent Gallup Poll found that among eight major household worries, which included not being able to pay the mortgage and inability to afford medical bills, the most severe worry is "not having enough money for retirement".[6]

These demographic shifts anticipated by the retirement of baby boomers have been studied for some time, but their financial implications and their interrelationships to the broader economy have become central issues for policy-makers today. Both sides of the political aisle in the United States have been loath to speak about cuts to entitlement programmes for fear of angering seniors who are reliable voters. But those positions are less sacred, as politicians make little headway in addressing growing sovereign debt.

The linkages of ageing to the broader economy are tightly intertwined. In a recent New York Times article on the greying population, political economist and demographer Nicholas Eberstadt of the American Enterprise Institute suggested, "Costs associated with population ageing are estimated to account for about half the public-debt run-up of the OECD economies over the past 20 years".[7] These trends and linkages all underscore that demographics are mainstream issues for economists and politicians.

While changes have been implemented in retirement schemes over the past decades, those have often come in reaction to a financial crisis rather than as a product of thoughtful deliberation. Basic questions remain in debate, such as:

- Who should bear the investment risk for saving for retirement?
- What is an appropriate retirement age, given the changes in longevity?
- What is the correct savings target to meet retirement expectations?
- Can employers change the terms of employment (i.e., the benefits or retirement age) for current workers and retirees?
- Do we have retirement schemes that are responsive to increased longevity and flexible approaches such as partial retirement?
- How do we encourage workers to begin saving earlier in their careers?
- What levels of resources do employers and governments require to support retirement plans in the long run?

As fundamental as these questions are to financial security in retirement, largely intractable differences of opinion remain – not theoretical, but on the front burner –- in countries, states and municipalities throughout the world.

Strong Resistance to Raising the Retirement Age

European media heavily covered the 2010 national strikes in France, when over 1 million French workers took to the streets.[8] The cause of this sharp discontent was not, as one might expect, concerned with the global economic crisis per se, but rather with President Sarkozy's proposal to increase the retirement age from 60 to 62. In 2011, more strikes were ignited in countries ranging from India (Kashmir), where workers protested increasing the retirement age from 58 to 60,[9] to Greece and Nigeria.

Although the official retirement ages for most OECD countries fall within a fairly narrow band of 60 to 65, governmental reform proposals are fairly modest within that range. Even social security in the United States has undergone only two changes to its retirement age structure in its 75-year history. In the late 1950s an early eligibility age was established, and in the early 1980s, normal retirement age was raised from 65 to 67. Thus, regardless of changes in longevity and labour market participation rates, there is strong institutional and societal resistance to raising the official retirement age.

High Anxiety about Retirement Prospects

In light of the recession, workers have high anxiety about their retirement prospects. In a recent US survey, 84% expressed concerns that current economic conditions are impacting their ability to achieve a secure retirement.[10] Furthermore, Americans have rather low retirement expectations, with 34% defining a secure retirement as simply surviving or living comfortably.[11] Not surprisingly, anger and anxiety from the recessions are influencing older workers' attitudes towards proposed changes that impact their opportunities for a secure retirement.

One of the more aggressive efforts by government leaders to constrain pension costs has been to curtail or limit the benefits of current workers or retirees. It has been readily accepted that such changes, regardless of severity, can be introduced in the workplace to impact future workers. However, their desired immediate budgetary impact in many government or collectively bargained settings is often legally constrained. Those definitions of protections vary considerably by legal jurisdiction and also have come under attack as policy leaders search for reforms that will have a material financial impact.

In the United States, for example, three states – Colorado, Minnesota and South Dakota – recently implemented changes that reduced cost-of-living benefits for current retirees. Although these rights would be protected in many jurisdictions, the three states successfully argued that without these changes, there would be significant financial repercussions to their pension plans.

Clearly, these changes to public employment retirement schemes run counter to efforts to ensure that workers have adequate long-term security. They also have created political tension through renewed labour-management conflicts. Foreshadowing events of the coming months, the Economist featured on its cover at the start of 2011 a headline on the "battle ahead", arguing that public-sector unions will be at the centre of the debate over benefits and legal privileges.[12]

In addition to the actions in Europe over retirement age, state governments in the United States, even in traditionally moderate states like Wisconsin and Ohio, not only attempted restrictions to benefits, but also have sought to curtail bargaining rights for public workers. These sharper political directions have shifted debate from some of the substantive issues concerning retirement adequacy to partisan differences on worker rights and political philosophy.

The global slide towards defined-contribution plans in lieu of defined-benefit plans has settled well with businesses by limiting their exposure to downside risk, which proved highly beneficial to the bottom line over the past decade. In one survey of CEOs, 71% said that federal, state and local governments should shift to defined-contribution plans, and 7% said that all pensions should be eliminated.[13] However, the other side of the ledger is far darker. Many argued that the real financial crisis is still to come – the retirement of a massive generation of baby boomers with inadequate retirement savings. The median household headed by a worker aged 60 to 62 with a 401(k) is estimated to have less than one-quarter of what is needed to maintain his or her standard of living.[14]

The Employee Benefits Research Institute (EBRI) found in its research in 2010 that one-half of baby boomers and GenXers were at risk of not having sufficient retirement income to cover even basic expenses and uninsured healthcare costs.[15] While there is a growing body of financial literature on the inadequacies of these savings levels for baby boomers, there is little analytic work on the financial stress to broader social and economic systems. More time has been focused on lowering costs by restricting direct outlays to pensions than on determining the new indirect costs that will result from greater reliance on government-supported social services.

Risk of Intergenerational Financial Friction

To the extent that long-term obligations for health and retirement have been inadequately funded, those financial pressures have the potential to bring about significant intergenerational financial friction and conceivably expressions of outright hostility. In the recent best-selling book, 2030: The Real Story of What Happens in America, one protagonist is a teen gang member. Unlike the gangs of today, however, these alienated children hated "the whole idea that their lives were going to be tougher than those of their parents – something that had never happened before in America".[16] While this may well be an exaggerated interpretation of this economic trajectory, it nevertheless captures the difficulties policy-makers face in balancing the economic needs of generations of workers.

The evolving support ratios (number of people of working age compared to number of people beyond retirement age) underscore the deepening economic transformation. Ratios for developed nations hovered in the 3-4 range in 2010, down from the 4-5.5 range in 1970. Projections just 40 years out predict most of those ratios will drop under 2.5 and, in a few striking examples like Japan, reach a startling 1.2.[17] Not only will there be a much larger senior population requiring social services, but the underlying tax support structure will decrease as a ratio per senior.[18]

A Shift to "Short-Termism"

Although funding an adequate retirement plan and maintaining assets throughout a lengthy retirement should be a long-term endeavour, the investment environment has noticeably shifted to one described as "short-termism". With the high turnover of elected officials, political systems have historically had a short-term orientation. Financial markets have also shifted, in large part due to the influence of money managers, mutual funds and hedge funds that focus on short-term stock price performance.[19] Mutual funds in particular, which have become the lifeblood of defined-contribution plans, have moved retiring workers to products with higher fee structures and high portfolio turnover. In contrast, traditional pension plans have been an important source of long-term patient capital, setting asset allocations on long-term capital assumptions.

There is considerable debate about whether we have entered a "new normal" period that would have a potentially critical impact on the elderly's long-term savings. Even the modest lowering of investment assumptions by large institutional investors signifies a conservative shift that will be all the more magnified through defined-contribution plans and individual-savings plans, both of which deal poorly with longevity risk.

Reconciling the short-term volatility of the markets with reliable long-term projections has been difficult. Nevertheless, concerns that nominal GDP growth rates will be 3% to 4%, resulting in a return of assets of half of what they were during the previous 10 to 20 years, will greatly reshape the retirement security of future generations.[20]

Workers Anticipate Working Longer

How have workers responded to the recession? Given the dominance of market-sensitive retirement plans, one would expect many workers to give serious consideration to working longer, as well as attempting to increase their savings rate. Research indicates that following the 2008 market downturn, 40% anticipate retiring later, expecting delays of four or more years.[21] Furthermore, two-thirds of respondents indicated no change in their contributions to their 401(k)s and IRAs, although they were spending less. Similarly, Gallup Poll data shows a significant shift over the past 15 years of those that expect to retire after 65 increasing from 12% in 1995 to 37% in 2010.[22]

On an international basis, considerable gaps in pension coverage remain. The OECD has suggested that, "introducing mandatory private pension appears to be the only way to have private pensions that cover significantly more than half the working-age population".[23]

How accurate are retiring workers in estimating their retirement needs? In 2010, nearly 29% felt they needed less than US$ 250,000 at retirement and another 17% indicated US$ 250,000 to US$ 499,000.[24] Either sum would produce a very modest annuity in retirement. Nevertheless, workers nearing retirement have accumulated sums on average that are far below even these thresholds in their 401(k) accounts, with those in their 50s having an average balance of US$ 139,932 and workers in their 60s having an average balance of US$ 144,004.[25]

Conclusion

The financial crisis has collided with the demographic shifts and brought into sharp focus many underlying policy questions that have not been adequately addressed. Facing a generation of retiring baby boomers, many of whom are clearly ill prepared for retirement, governments will be faced with still more financial challenges to their support programmes.

We have reached the point where there will need to be a realistic assessment of official retirement ages, modifications to company policies to allow for work after retirement, and recognition that the market's performance over the past decade has underscored the weaknesses of exposing workers to retirement schemes that have placed too much risk on their shoulders.

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Chapter 3
Women and Ageing

Saadia Zahidi

The proportion of people age 60 and over across the world rose from 8% in 1950 to 11% today, and by 2050 it will rise to 22%. Furthermore, the population of older persons is itself ageing. Today, persons aged 80 years or over account for about one in every eight older persons (60 or over). By 2050, this ratio is expected to increase to approximately two persons aged 80 or over among every 10 older persons.

On average, women outlive men by nearly 4.5 years, and thus make up the majority of older people in the world, particularly amongst the "oldest old". Women in developed countries have higher life expectancy at birth and at older ages, than do men. Women usually have an advantage in developing countries as well. However, high maternal mortality, discrimination against women in nutrition, access to healthcare and other areas, and in some cases the killing or neglect of female infants mean that in certain poor countries, women's life expectancy is about the same as, or even lower than, men's. Over the next few decades, as these conditions improve, women's life expectancy in the developing world is expected to increase faster than men's. As a result, the situation in these countries will come to resemble that in the developed world today. Table 1 displays the proportion of women amongst the population of older people in selected countries.

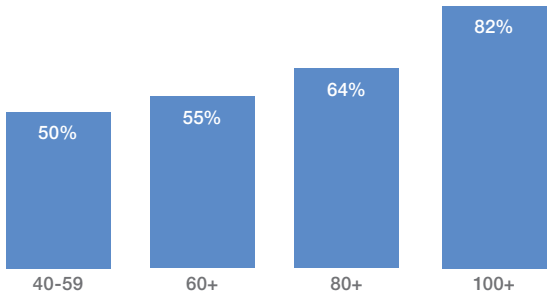
Table 1. Proportion of women among person's aged 60+ and 80+, selected countries

		Population of older people, 2012				
Country	Total population (millions)	%60+	%80+	60+ as % of 15-59	% female among 60+	% female among 80+
Australia	22.9	20	4	32	53	60
Brazil	198.4	11	2	17	55	60
China	1,353.6	13	2	20	51	59
France	63.5	24	6	41	56	65
Germany	82.0	27	5	44	56	66
India	1,258.4	8	1	13	52	55
Indonesia	244.8	9	1	13	55	60
Italy	61.0	27	6	46	56	65
Japan	126.4	32	7	57	56	65
Mexico	116.1	10	1	15	54	60
Republic of Korea	48.6	17	2	25	57	70
Russian Federation	142.7	19	3	28	66	76
Spain	46.8	23	5	37	56	63
Switzerland	7.7	23	5	38	55	65
United Kingdom	62.8	23	5	39	54	63
USA	315.8	19	4	31	56	64

Source: The figures in this Table are sourced from the statistics that can be found in the Appendix.

Currently, women outnumber men by about 70 million among those aged 60 or older. Among those aged 80 or older, women are nearly twice as numerous as men, and among centenarians women are between four and five times as numerous as men. Figure 1 displays the proportion of women among older persons globally. There are a number of challenges and opportunities associated with global population ageing. Because women make up the majority of the old, and particularly the majority of the oldest old and the most vulnerable old, defining the particular set of challenges faced by older women and tailoring responses to these challenges will have to be a critical part of any efforts to understand, adapt to and respond to global ageing.

Figure 1. Proportion of women among persons aged 40-59, 60+, 80+ and 100+ years (world, 2007)



Source: United Nations Department of Economic and Social Affairs, Population Division, "World Population Ageing 2007

Challenges in Responding to Global Ageing

Ageing leads to different outcomes for women and men, with women facing particular challenges of health, economic insecurity and greater caregiving burdens. The underlying factors for these gender gaps are partly women's longer lifespan, different susceptibility to disease and trends such as globalization and urbanization. However, these factors can ultimately be largely attributed to the persistent social, political and economic inequity girls and women face throughout their lives and that are manifest or compounded during their old age.

Health Gaps

A universal concern for the elderly is access to healthcare. Industrialized and less developed countries alike share the challenge of making healthcare affordable and accessible. Health in old age has to do not only with presence or absence of disease. Availability and quality of care are also important. Most older people, even those in generally good health, will eventually need more care than they did earlier in their lives. Therefore, the ways society provides – or fails to provide – this care can greatly impact an older person's quality of life. While this is a concern in relation to all older people, the considerations are very different for older women.

First, due to the differential life expectancy of women and men, there are simply more older women in the world than older men – especially among the "oldest old", those 85 years of age and older, whose capacities, conditions and needs are different from those in their 60s and 70s. Given that disability rates rise with age, this means that there are substantially more older women than older men living with disabilities.

Second, even if women on average live more years than men, many of these years may be spent living with disability or illness. If "healthy life expectancy" – that is, expected years of life "in full health" – is examined in place of overall life expectancy, women's advantage over men often becomes smaller. In many developing countries, social and economic factors mean that women enter old age in poorer health and, once old, tend to have inadequate access to healthcare. In their younger years, women are often unable to seek or receive medical treatment, subordinate their health needs to those of their families, have limited opportunity to form social contacts, suffer injuries and other health problems from violence, receive inadequate nutrition, do not get enough exercise, or spend time in hard physical labour. Each of these factors leads to illness and disability in later years. Older women often have less access to insurance or enough cash to pay out of pocket, so medical concerns often remain undiagnosed for prolonged periods of time.

Furthermore, common gender norms mean that it is older women, not men, who are often called upon to be caregivers themselves. Thus, it is not an uncommon occurrence for an older woman to be caring for others, even though she is disabled, has lost her husband and has no one to take care of her. There is little research quantifying the extent of their contribution and the ways it can affect women's own health and disability in later life.

Third, women experience higher rates of chronic illness and disability later in life, whereas elderly men suffer from more acute conditions that require finite hospital stays. Chronic illnesses such as senile dementia require long-term care outside of a medical facility, which places a disproportionate burden on family and community. Currently, healthcare professionals in developing countries are not adequately trained to handle older age illnesses or educate others on how to properly manage them. Increasingly, in both developing and developed countries, family cannot be depended upon to provide adequate lifelong support for the growing number of older women who not only continue to outlive men, but also live to a very frail age.

Economic Insecurity

Women make up not only the majority of the old, but also the majority of the poor old because they generally have less opportunity to earn a living during their lifetimes, tend to be less economically active in their older years than men, do not have access to formal social security systems and tend to have lower social status and economic rights when they are widowed.

First, in both developing and developed countries, current societal arrangements cumulatively result in a lifetime of unequal and inadequate access to education, economic participation and opportunity for women. Illiteracy is still common among the older population of less developed regions, with only about one-third of older women and about three-fifths of older men in developing countries having basic reading and writing skills. Women spend more time than men working in informal sectors of the economy. From childhood and through to retirement age, women are expected to perform wageless duties such as child rearing and household tasks.

Although these services can be crucial to the family structure, they leave women without marketable skills or an opportunity to build and manage their financial security. In much of the developed and developing world, the generation of women that is currently amongst the older age population did not generally have the opportunity to combine paid work and family. Furthermore, women's access to property ownership and inheritance, ability to move about in public as needed, authority to give informed consent and make important decisions, confidence and sense of self-worth, are also limited by existing societal structures, leading to compounded economic insecurity in later life.

Second, as in their prime years, rates of economic activity among the "silver workforce" are different for older women and older men. Just 13% of men aged 65 years or over are economically active in the more developed regions, whereas 39% are in the labour force of the less developed regions. In the more developed regions, 7% of older women are economically active, compared to 15% in the less developed regions.

Third, older women often do not have access to social security systems and pension benefits. Since the majority of women work outside traditional labour markets, they have little or no access to individual pay-as-you-go pension programmes or time to build up any significant wealth or savings for retirement. In most countries the statutory age at which a full pension can be obtained, provided a minimum period of contributions to the pension system is completed (i.e., the pensionable age), is the same for women and men or lower for women, even though women can expect to live longer than men after age 60. For both men and women, pensionable ages tend to be higher in developed than in developing countries.

Fourth, women's longer lifespans, combined with the fact that men tend to marry women younger than themselves and that widowed men remarry more often than widowed women, mean that there are vastly more widows in the world than there are widowers; only 43% of women aged 60 and older remain married, as compared to 79% of older men. Given that women in many countries rely on their husbands for the provision of economic resources and social status, widows struggle to find economic support from family and community because of their lost status as married women. As a result, a large percentage of older women are at risk of dependency, isolation, poverty and neglect. Social isolation of widows is further compounded by urbanization, emigration, immigration and the literal and figurative movement of younger people away from more traditional family structures.

Globally, an estimated 19% of women aged 60 or over live alone compared with just 8% of men in that age group. In some cultures, destructive attitudes and practices around burial rights and inheritance may rob widows of their property, health and independence, and in some cases, their lives. For example, in countries such as Rwanda, Honduras and Ethiopia, it is often illegal or unconventional for a widow to collect on her husband's pension, property or savings; the inheritance is passed on to an eldest son or brother with no obligation to support the deceased's widow.

Women Bear the Caregiving Burden

The health of older persons typically deteriorates with increasing age, inducing greater demand for long-term care as the numbers of older persons increase. Older women can serve as caregivers themselves, as well as being among those who need to be cared for, in both developed and developing countries. The burden of caregiving for the young and the elderly often falls upon women.

In addition, women's traditional role as family caregivers may contribute to their increased poverty and ill health in older age. Women may need to stop working in their prime to fulfill their gender-based roles of raising families or to become caregivers for their elderly parents. Others never have access to paid employment because they work full-time in unpaid caregiving roles, looking after children, older parents, ill spouses and grandchildren. Thus, the provision of family care is often achieved at the expense of the female caregiver's economic security and good health in later life.

In parallel, common gender norms mean that it is older women, not men, who are often called upon to be caregivers themselves. For example, women, including older women, have had to take on the caregiver role in countries with a high prevalence of HIV/AIDS. Numerous studies have found that most adult children with AIDS return home to die; and female relatives take on the bulk of the care, including that of any orphaned grandchildren. Furthermore, as more young adults migrate to urban areas or to other countries, the care, development and education of any children left behind will fall to older women who, without significant and timely support structures put in place, will have few resources with which to provide support.

Crisis situations such as war, forced migration, famine and epidemics can further exacerbate the caregiving burden of older women by reducing younger workers and wage earners, who are often the basis of support on which many older people must rely in the absence of public social insurance schemes. These crisis situations leave in their wake orphaned, sick and disabled people who must be cared for. Older women are especially affected by both outcomes because they generally control fewer economic resources and must rely more heavily on the support of younger adults. In addition, the care of needy children and others is most likely to fall to older women in the absence of younger women to do the job.

Tailoring Policy and Business Responses

Population ageing has major consequences and implications for all facets of human life. It is clear that taking steps now to empower, protect and understand the oldest demographic will be critical. Women make up the majority of the old. They face particular economic, health and caregiving burdens during old age, have different needs from those of men, and use their time and resources differently. Tailoring policy and business responses to match these challenges and differences will need to be an important aspect of the broader responses to ageing.

Women make up the majority of older people because they tend to live longer than men. However, older women also tend to have lower standards of living compared with older men, due to the multiple social and economic disadvantages they face in their youth. As they grow old, further complexity is added due to changing intergenerational social dynamics. This implies that to address the challenges faced by older women – economic insecurity, health gaps and the caregiving burden – and to leverage the different choices older women make with their time and resources, there is a need for:

- Instituting policies and practices that catch women "upstream", before they get old
- Applying a gender lens to existing and new measures affecting older populations to ensure that women are not overlooked
- Developing specific policies, products and innovations that are designed to focus on the needs and interests of older women

Access to quality education is a critical factor in women's social and economic empowerment and has multiplier effects on entire families and communities. Furthermore, removing barriers to women's access to economic activity is necessary for reaping the returns on investments in women's education. Women's growing presence in the workforce may have some negative implications for their ageing parents, including in particular older women for the reasons outlined above. However, in the longer term the ability of these women, as well as that of future generations, to secure economic independence will be a crucial factor in safeguarding their health, economic security and social status during their old age.

Investing in Education and Economic Empowerment

For policy-makers this implies investment in women's education and economic empowerment as a means of gaining returns when the ageing population bulge grows. This is in addition to the other multiple competitiveness gains to be had through women's integration into the mainstream economy. In developing countries, particularly those that are growing old before they grow rich and still have relatively large gender gaps in education and economic participation, boosting women's schooling and workforce participation may be critical to mitigating their approaching ageing population challenges (e.g., in India, Indonesia and Mexico).

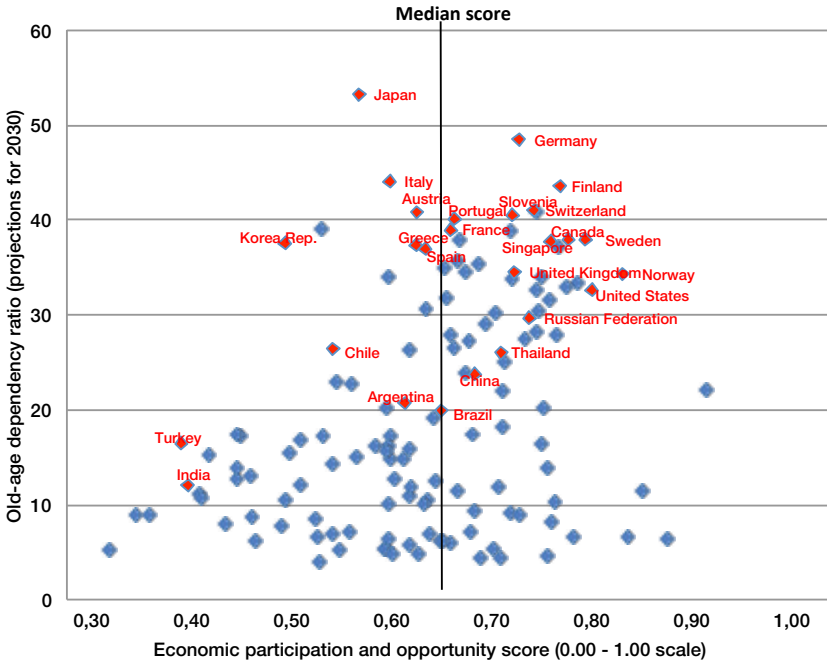
Older individuals tend to consume more than they produce, so a larger share of older people means a relatively small workforce struggling under a huge burden of elderly dependency. In developed countries, particularly those that already have an ageing population and still have relatively large gender gaps in economic participation, boosting women's workforce participation could be critical to reducing the older-population-to-workforce ratio over time (e.g., in Japan, Spain and Italy). Figure 2 shows the old-age dependency projections for 2030 for select countries and highlights those countries that face high dependency projections combined with low levels of women's economic participation and opportunity.

Gender Responsive Policies

The reduction of potential support ratios has important implications for social security schemes. Gender-responsive polices in the areas of health and social protection will be essential, for their impact on individuals as well as the multiplier effects on communities. Older women are more likely to share their pension income with the rest of their household, increasing the family's overall financial position and positively impacting intergenerational transfer, including playing a pivotal role in empowering the next generation of girls.

In Latin America, the additional income has been shown to slow the rural-urban migration that has so profoundly contributed to the isolation of older women. Given that women live longer than men and are going to join the workforce in larger numbers in many countries over time, policy-makers will also need to examine the impact on pension systems, as more women will be dependent on them for longer times.

Figure 2. Old-age dependency projections and women's economic participation



Data from the World Economic Forum's Global Gender Gap Index 2011 is displayed on a 0-1 scale with 0 representing inequality and 1 representing equality. The Economic Participation and Opportunity subindex includes five variables: labour force participation, estimated earned income, wage gaps for similar work, professional and technical work positions and legislators, officials and senior managers.

Conclusion

Maintaining the health and well-being of the elderly population is a universally shared concern. Reasonable access to proper healthcare is crucial not just for older women themselves, but also for the households with whom they live. The United Nations and World Health Organization both advocate for prevention and better management of disabilities prevalent in older women, namely chronic diseases.

In addition, educating family members on how to manage long-term outpatient care for chronic illnesses needs to be incorporated into healthcare providers' training. People are living longer in large part because of better medical knowledge and treatment. However, as the population shifts, so too must the way medicine is practiced around the world. And it should be practiced with an adequate gender focus to address the feminization of the ageing population.

Owning land, particularly in developing countries, is a source of wealth and social power. Women who own land are more likely to have households with better nutrition, support education of more children, and circumvent isolation and secure economic independence later in old age. Globally only 2% of land is owned by women. In the last five years, advocacy programmes in countries such as Tajikistan, Nicaragua and Ethiopia, among others, have begun to successfully influence governments to formally protect older women's and widows' land entitlements, and to provide community education on the topic. Most of these programmes are replicable and scalable; broader adoption of such successful interventions is required in other countries.

Better understanding, measurement and valuation of the role of older women as caregivers are also needed. For countries whose HIV/AIDS prevalence rates have produced a generation of orphans, it is crucial that older women who have worked only in the informal sector have access to social protection in order to provide in the absence of a biological parent. While such social protection programmes require significant investment and administrative costs, the long-term public good may outweigh the initial investment burden.

As consumer preferences change, ageing also holds implications for the development of new products and services in the areas of healthcare, insurance, entertainment, retail, food and nutrition, technology, personal development and care. Women in general, even as their consumption power has grown, are a vastly underserved market, particularly in the areas of food, travel, fitness, apparel, beauty, financial services and health. Older women have specific needs and preferences within these and other areas, but the "empty nest", older female demographic is generally ignored by marketers. This implies potential opportunities for business, particularly in developed countries, as larger numbers of educated, working women, with higher consumption power, go into retirement.

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Chapter 4
The Media's Portrayal of Ageing

Colin Milner, Kay Van Norman, Jenifer Milner

Has the media's portrayal of ageing influenced society's views and responses to population ageing? And if so, why? What messages do the mass media send to society about the later years of life?

News, television, film and advertising commonly feature stereotypes that show older adults through a lens of decline and diminished value, emphasizing the "burdens" of growing old.[1] Use of such stereotypes – as well as negative language about ageing – shapes, reinforces and reflects society's attitudes and responses to growing older and, by extension, to population ageing.

This one-sided media messaging has created a distorted view of ageing. The result, in many cases, is low expectations of ageing[2,3] that extend into all areas of life, including the workplace[4] and healthcare.[5,6] Moreover, even with years of advance warning, "societal and economic structures in many industrialized economies are ill-placed to cope" with an ageing population.[7]

The Origins of "Ageism"

What are the origins of such prevailing negativity about ageing? According to Robert N. Butler, founder of the International Longevity Center (ILC) in New York, answers are found both in the past and the human psyche.

In his introduction to Ageism in America, a 2006 ILC report, Butler writes that old age was generally valued in primitive societies. "Older persons often provided knowledge, experience, and institutional memory that was of adaptive – even survival – value to their societies. Although nomadic groups in various parts of the world abandoned the old and disabled when safety and security were at stake, overall older people were venerated", he explains.

Butler continues: "However, as the number and percentage of older persons, especially the frail and demented, increased, the perception grew that they were burdens to their families and society. It became widespread as societies shifted from agrarian economies, where older men had traditionally owned the land, to industrialized economies, when work was no longer centred in the home and older persons lost authority".[8]

These are the "the historic and economic circumstances" in which the status of today's older adults and attitudes toward them are grounded, Butler notes. Other key influencers include "deeply held human concerns and fears about the vulnerability inherent in the later years of life. Such feelings can translate into contempt and neglect", he adds.[9]

These ideas represent the building blocks of ageism, a term that Butler introduced to the world in 1968.[10] Today, more than 40 years later, ageism still thrives, especially in Western cultures. The ILC report defines four categories of ageism.[11] These include:

Personal ageism – ideas, attitudes, beliefs and practices on the part of individuals that are biased against persons or groups based on their age.

Institutional ageism – missions, rules, and practices that discriminate against individuals and/or groups because of their older age.

Intentional ageism – ideas, attitudes, rules or practices that are carried out with the knowledge that they are biased against persons or groups based on their older age. This category includes practices that take advantage of the vulnerabilities of older persons.

Unintentional (or inadvertent) ageism – ideas, attitudes, rules or practices that are carried out without the perpetrator's awareness that they are biased against persons or groups based on their older age.

All four types of ageism can be found in the media and marketing today.

Ageism in the Media

Mass media is a critical platform for communicating the meanings and experiences of ageing between generations, and plays a role in shaping the agenda for discussing ageing issues.[12] Media portrayals of ageing not only reflect the widespread ageism in society, but also largely reinforce negative stereotypes. In addition, when ageing is depicted in a manner that appears positive, the aim is often to push anti-ageing messages and frame defying ageing as the only example of successful ageing.

For example, in May 2011, the cable news channel MSNBC reported on a US study showing the disconnect between fashion magazines and their ageing readers. "An analysis of editorial and advertising images reveals that despite proportions of older readers ranging as high as 23%, fashion magazines portray women over 40 sparingly, if at all," writes LiveScience senior writer Stephanie Pappas. "Even in magazines geared toward ageing baby boomers, the images collectively present a thin, youthful, wrinkle-free ideal that's impossible to maintain later in life."[13]

This ideal has an impact on body image in older women, according to Denise Lewis, a University of Georgia gerontologist and author of research published in the Journal of Ageing Studies.[14] "It leads to issues that have people denying ageing, so going to great lengths to continue to look like that ideal of a youthful person", Lewis explains. This view of ageing promotes the idea that age-related changes in physical appearance are highly undesirable; therefore, all means should be taken to erase them.

Dove, a global personal care brand, challenged those beliefs through its award-winning Campaign for Real Beauty. One advertisement and billboard featured a 95-year-old model and posed the question: "Withered or Wonderful? Will society ever accept old can be beautiful?" Viewers were invited to log on to the campaign website and cast their votes. This ad proved a tremendous success, largely by tapping into society's negative expectations of ageing and making people reconsider them. Further, the Campaign for Real Beauty translated into tremendous business success for Dove, which claimed a 700% rise in product sales in the United Kingdom (where the marketing effort originated) and 600% in the United States within the first two months of the campaign's launch.[15]

Marketers make choices every day that have an impact on how society views ageing. Consider a campaign for Circle K convenience stores in Atlantic Canada that uses drawings of a person in three stages of ageing to illustrate the sizes of "Geezerade" slushy drinks and their cost. The eldest stage, which corresponds to the largest and most expensive drink, is an ageing caricature: a bald, toothless, wizened old man. Aimed at engaging youngsters, this campaign blatantly disrespects old age.

On the opposite end of the scale are the campaigns that suggest all older adults are "super seniors". Portrayed in the media as healthy, wealthy and defying ageing, super seniors present an image of older adults that also distorts reality. Such stereotypes make it clear that "good" old age requires health, independence, and economic and social vitality, reflecting the dominance of independence, youthfulness, effectiveness and productivity as values in Western societies.[16]

"Bad" old age is characterized by illness, decline and a strain on social programmes and economies around the world. Yet, people do not have to look a certain way, participate in extreme sports or be free of functional challenges to be engaged in life, resilient and capable of setting an example of wellbeing.

Too often missing from media portrayals is a balanced view of ageing; one that reflects the challenges of getting older, while embracing the opportunities associated with ageing.

Media Responses to Population Ageing

Researcher Julia Rozanova, now an assistant professor at Canada's University of British Columbia, published a study in 2009 in which she analysed newspaper, television and magazine content for depictions of ageing in Canada and Russia. Rozanova found that in both cultures older age groups were underrepresented, negative portrayals far outweighed positive portrayals, and older individuals with disabilities were virtually absent from advertising unless they were advertising assistive devices.[17] This lack of representation in the mass media may contribute to marginalizing older adults, who already feel the effects of ageism and a sense of diminished worth and participation in society.

Older adults notice not only how little they are represented in media and marketing offerings, but also how poorly. For many, these depictions simply do not resonate. According to market research, three in four adults over 55 feel dissatisfied with marketing aimed at them,[18] and 71% say that advertising images largely do not reflect their lives.[19] Results from a survey conducted for TV Land, a US cable television channel, agree. Nearly two-thirds of baby boomers responding to this survey said they are growing increasingly dissatisfied with media that ignores them and they are tuning out.[20]

In the United Kingdom, a survey found that 55% of adults over 50 feel that businesses have little interest in older people's consumer needs; 46% often do not feel that advertising/marketing is aimed at them; and 50% find advertising/marketing that is obviously targeting older people to be patronizing and stereotypical.[21] Further, a report by Help the Aged (now part of the charity Age UK) notes that 75% of respondents to a survey of people ages 60 and older thought that the media ignored the views of their age group.[22]

Underlying all those findings is the "astonishingly neglectful" treatment of older adults, "who feel ignored, unwanted and dissatisfied with the negative stereotypes used to portray them in advertising, which they regard as inappropriate and irrelevant".[23] Older people's impressions are well founded: 90% of marketing dollars are directed towards the under-50 population today, reports London-based marketing and advertising magazine AdMap.[24] Help the Aged estimates as much as 95% of advertising revenue goes to the under-35 age group.[25] These figures show that the age 50-plus market remains largely invisible to, and devalued by, marketers and advertisers, who misunderstand and misrepresent this population.

Why is this happening? It is important to consider that advertising agencies are overwhelmingly staffed by employees under 50 years of age.[26] In fact, fully 95% of employees in UK agencies are under age 50, with similar age structures for the advertising workforce in the European Union.[27] With so few professionals over 50, is it surprising that this industry lacks insight into the needs, interests and aspirations of older people, as well as the realities of their daily lives?

On the promising side, some media responses show a movement towards more realistic views of ageing. For example, Van Selm and colleagues compared how Dutch television commercials portrayed older adults in 1993 versus 2007. They found that while older-adult roles had not become more prevalent, they were more diverse and less stereotypical in 2007 than in 1993.[28]

Lien and colleagues examined prime time television dramas in Taiwan and found that older characters appeared less frequently and in less prominent roles than other adult characters, but were predominately portrayed as cognitively sound and physically healthy. However, older characters talked about age, linking it to death and despondence to influence younger characters. Dominant behaviour themes reinforced Chinese age stereotypes and traditional values.[29]

In Germany, Kessler and colleagues examined how advertisements portrayed social participation of older adults. They found that only 4.5% of the characters in 656 ads were 60 years or older. However, when older adults did appear in ads, these individuals were depicted as socially engaged and open to new experiences.[30]

Many of these more positive depictions of ageing, however, result from marketers trying to reach the lucrative baby boomer market segment with messages of eternal youth. These anti-ageing messages stigmatize both normal changes associated with the ageing process and ageing with any kind of disability or deficit.

The Impact of Media Portrayals

If positive portrayals of ageing promote the idea that defying ageing is the only way to age successfully, negative stereotypes of ageing then prime (prepare) a person for decline, diminished resilience and the subversion of health promotion efforts.

Age-based stereotypes are often internalized in childhood, long before the information is personally relevant, so they are accepted without critical examination. Termed "pre-mature cognitive commitment" (PCC), this mindless coding leads people to accept beliefs unconditionally. Later, when people perceive themselves to be ageing, the coding acts as a self-induced prime, causing them to act in ways consistent with this coding and creating a self-fulfilling prophecy.[31] For example, Martin might believe that older adults cannot easily climb stairs, so he will sell his home with stairs in favour of a one-level style. No longer climbing stairs at home, he finds it more and more difficult to navigate stairs in the community. Eventually, he is no longer able to climb stairs, confirming his original belief.

Repeated exposure to negative images and messages about ageing confirms beliefs and entrenches negative stereotypes more deeply, both consciously and subconsciously. Once people believe they know something, most will actively look for information consistent with that belief.[32] They do not have to look far.

Media portrayals of ageing are predominately negative. They contribute to a culture where people are both consciously and subconsciously primed to follow the negative ageing story. They also affect the way older adults see themselves and the way they are viewed and treated by society.

Dozens of studies have demonstrated how subconscious priming for either positive or negative stereotypes impacts the function of older adults. Collectively, these studies show that older individuals exposed to positive primes perform better on both physical and cognitive tasks than those exposed to negative primes.[33],[34],[35] Negative primes had other surprising effects. They heightened cardiovascular responses to stress, i.e., heart rate and blood pressure, while positive primes muted these responses. Older adults exposed to negative primes were less likely to accept life-prolonging interventions in hypothetical medical situations than those exposed to positive primes.[36]

Other studies demonstrate that adults with positive self-perceptions of ageing engage in more health-promotion strategies and take better care of themselves than those with negative perceptions of ageing.[37] In addition, negative stereotypes affect an individual's self-esteem, self-efficacy and resilience – all factors related to whether older adults perceive that they have control over health outcomes.[38,39,40]

The impact of negative views of ageing is simple, according to a study led by Becca Levy, PhD, Yale School of Public Health. Older people can literally "think" themselves into the grave 7.6 years early by feeling "bad" about getting old.[41]

Recommendations

To transform the experience of ageing and ageism in our societies, we must change the way the media and marketers portray ageing. Negative stereotypes need to give way to realistic portrayals, so that depictions encompass the many different experiences of ageing without attaching a value judgment.

Today, the concept of ageing is expanding and evolving as the older population demonstrates its many aspects and contributions. As new ideas and concepts come into being, new words and meanings emerge while other words and meanings recede and disappear. The stage is set for language and imagery that provide a fair, accurate and balanced view of ageing. How do we encourage the media to acknowledge its influence over society's conversation about ageism and to exert a positive influence? One way is to show the financial benefit.

Dove's Campaign for Real Beauty confounded stereotypes of beauty in its advertising and reaped the rewards. Similarly, a vast market of potential customers awaits media, marketers and businesses whose portrayals of ageing resonate with older consumers. This chapter shows that marketing messages are currently both missing and missing the mark.

To succeed with their outreach, the marketing and media professions need new ways of relating to older populations. Tools to educate and support this shift are key. Recommendations focused on these professions include:

Researchers, governments, industry associations and global organizations can create a clearinghouse of media and marketing research, best practices, communications guidelines and images of today's older adults. The goals for this clearinghouse will be to educate media and marketing professionals about "real life" ageing, the diversity of older adults and the opportunities presented by this market; as well as to encourage these professionals both to provide effective and accurate portrayals of ageing and to stop using negative stereotypes and language.

Media and marketing companies, including film, news, television and publishing, can increase the prevalence and diversity of older adults represented in their offerings. This visibility will send a strong message, reinforcing the fact that older adults are part of the fabric of society and celebrating the value of experience.[42]

Governments can provide post-secondary institutions with tax incentives to educate future media and marketing professionals about ageism and the older population. An understanding of ageism and its impact will encourage professionals to recognize the damaging myths, negative stereotypes and false perceptions of ageing fuelled by this prejudice and to avoid perpetuating them.

Governments can provide incentives or tax breaks for businesses, media and marketers to educate themselves and their customers about healthy, active ageing. This will help them understand the many possibilities for individuals to lead full lives at any age.

Researchers and academic agencies can take a well-rounded view of ageing when they report about this topic. A more complete, balanced approach will help temper "apocalyptic" reports of ageing, which in many cases fuel media coverage, business investment and government spending on the issue.

Researchers and organizations can showcase companies that have succeeded with the older-adult market and highlight how media and marketing can learn from them. Some potential avenues for sharing insights and information will include best practices, documentaries and awards programmes.

Through mass media, negative messages about ageing are becoming increasingly globalized. Efforts to address their impact will be most effective if governments and nongovernmental organizations share research and best practices that influence the way media and marketing professionals position ageing. Organizations such as the World Economic Forum have a role to play in bringing together businesses, governments, media and marketers. The goal of such interactions will be to create and synchronize global strategies that embrace the opportunities of population ageing and better address the challenges. It is important to recognize, however, that societies around the world view and respond to ageing in their own ways, and each needs to customize approaches to their specific culture.

Conclusion

Increased life expectancy is one of the most significant success stories of our times with global population ageing presenting both challenges and opportunities for society. Has the media's negative portrayal of ageing contributed to a slow and inadequate response to the challenges, as well as a lack of understanding of the opportunities? Based on all the evidence cited above, this article concludes that it has.

Ultimately, if we are to manage population ageing well, we need to acknowledge the impact of the media and marketers on shaping perceptions of ageing, and strive to reform the way they view and portray people living in this multifaceted stage of life.

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Chapter 5
Ageing and Intergenerational Equity

Norman Daniels

Although some countries still have high birth rates, many others, in most parts of the world, are ageing rapidly. In the United States there will be more people over 80 in 2040 than there are preschoolers,[1] though this might be dismissed as a special effect of the post-World War II US baby boom. The ageing of society elsewhere cannot be so easily dismissed. Italy, Spain and Japan have fertility rates far below what is needed to reproduce a population. In fact, all European G7 countries are below that level. By 2050, half of continental Europe will be 49 or older.[2]

The ageing of society is also significant in Latin America and dramatic in Asia. By 2050, there will be 332 million Chinese 65 years or over, equivalent to the world's elderly population in 1990.[3] Such societal ageing is the result of successful policies and social trends that have reduced both fertility rates and mortality rates. But success often creates new problems or sharpens old ones.

The Most Important Public Health Problem of the 21st Century

Indeed, global ageing creates what may be the most important public health problem of the 21st century. Health systems in many developing countries are not prepared to meet the burden of chronic disease and disability that ageing populations bring with them.[4] Few systems, even in developed countries, are prepared for the numbers of frail elderly who will need special living quarters and social supports, let alone nursing homes, when their needs make home care inadequate.[5]

The increased costs of chronic disease are difficult to bear in developed countries, even as we hope that compression of morbidity reduces this burden,[6] but in developing ones they threaten resource allocation to public health and preventive measures aimed at ongoing infectious disease problems. Nor are broader social systems in either developed or developing countries prepared for the shifting population needs that come with societal ageing – income support for a large population of retirees, special housing and social care needs, and new demands for adult education. At the same time, the forces of globalization that have led to massive urbanization and migration have disrupted older forms of social support for the elderly (see Chapter 19 of this book).

Thus, with global ageing comes a sharpening of the problem of intergenerational equity, both in developed and developing countries. Many developed countries have resource-transfer schemes that provide support for their elderly populations, but with shrinking working populations, these schemes face resource constraints. In the United States and Europe, for example, the current focus on deficit reduction has put great pressure on existing pension plans for millions of workers, and threatens national social security and healthcare schemes.[7] The lament in many developed countries is that they can no longer afford transfers to the elderly that were part of a social contract over many decades. In effect, existing solutions to the problem of equity across age groups are threatened by changing demographics.

What is worse, most ageing developing countries lack such transfer schemes and must face the emergence of significant elderly populations without them. Their lament is that they are growing old before they are rich enough to address the needs of the elderly in the ways that developed systems have, at least for several decades. They also lament that the family structures that had provided support for elderly people are changing with industrialization and migration in global labour markets, and there is nothing in place to replace them.

The Chinese attempt to mandate filial support for parents in a 1996 law cannot solve the problem, known as the 4-2-1 problem in China: four grandparents, two parents, one child.[8] People cannot be required to do what cannot be done. In the US, nearly one fourth of all the elderly in 1989 had no children and another 20% had only one child; with China's one child policy,[9] even more Chinese elderly may have no children or at most one.

These problems of intergenerational equity are the focus of this paper. Specifically, how should we think about equity across adjacent (as opposed to distant) generations? If the old and the young in a population are competing for resources, how should we think about their competing needs? What is fair treatment of different age groups? Is different treatment by age ever justifiable? If so, when? Or is differential treatment by age always an example of "age bias" we should avoid as a matter of justice? How should we think about the division of responsibility between the state and families? Are there ways to better engage families in meeting the needs of the elderly?[10,11]

Focusing this chapter on the problem of intergenerational equity means not addressing other important ethical issues facing ageing societies. Much bioethics literature, for example, discusses decision-making by and on behalf of cognitively impaired elderly[12] and the challenging topic of end-of-life care.[13] More broadly, gerontological literature has focused ethical concern on the difficulties of constructing work and life patterns that address the non-medical needs of an elderly population.[14]

Two Problems of Intergenerational Equity

The term "generation" is systematically ambiguous. It can refer to age groups, as in the suggestion that there is often tension, if not a war, between the young and the old. And it can refer to birth cohorts, as in Tom Brokaw's labeling of those Americans who grew up in the Great Depression and went on to fight in World War II as "The Greatest Generation".[15] Because age groups do not age, but birth cohorts do, over time different birth cohorts successively occupy the same age group. A birth cohort has a distinct social history, but age groups need not; when they do, it is only because birth cohorts comprising that age group at different times have a comparable social history. Age groups and birth cohorts have different criteria of individuation and are therefore distinct concepts.[16]

These distinct concepts give rise to distinct problems of equity. The general problem of age bias – favouring the old over the young or vice versa – is a problem of fairness to age groups. Making one birth cohort contribute more and get less than another cohort passing through a social security system is an issue of fairness between cohorts. Ideally, we want to design institutions that solve both problems together.

Let us suppose that fair treatment of different birth cohorts involves giving each birth cohort roughly equal benefit ratios when they pass through institutions that aim to solve the age group equity problem.[17] That may mean adjusting the contributions and benefits of groups over time. For example, if we know that a large cohort, like the US baby boom, will retire over a certain period, we may have to build up a cushion of contributions before it retires that will suffice to provide it social security benefits when it stops contributing to the transfer scheme (as the 1983 reform of the US social security system aimed to provide).

Of course this solution works only if the bulge is temporary and we have a way to even out benefit ratios over time. In any case, the solution abstracts from other historical contingencies,. For example, the economic climate facing the birth cohorts of working age in the United States during the Great Depression clearly affected their ability to contribute monetarily to cross-cohort schemes; but it did not undermine their political contribution to securing greater equity and prosperity for subsequent cohorts.

Although it may be politically hard to adjust benefit ratios and thus to solve the problem of equity between birth cohorts, the conceptually harder problem is the age-group problem. What is a fair allocation of resources to different age groups with different needs?

The Prudential Lifespan Account of the Age Group Problem

It is easy to be misled by an analogy between age discrimination and race or gender discrimination. Indeed, anti-age discrimination legislation in the United States was modeled on anti-race and -gender discrimination and seemed to imply that any differential treatment of people by age was problematic.[18,19]

The analogy is problematic despite the fact that there are clear examples of age discrimination that look very much like race or gender bias. If, however, we treat people differently by gender or race, we create inequalities between persons in liberty, income, wealth, opportunity or powers – or health – that are ethically problematic. But if we treat people differently at different ages, we do not create inequalities across persons, provided the same rules for different treatment apply across their lifespan. The point is the banal one that we all age, or hope to, although we do not change race or gender (with some exceptions). This changes the nature of the distributive problem.

Indeed, we may make people's lives go better if we do treat them differently at different ages and do so systematically over their lifespans. For example, we may charge people an "actuarially unfair" insurance premium or tax for their healthcare when they are younger and healthier workers, and charge them much less when they are older and less healthy retirees. Such a way of saving resources can improve people's lives as a whole. It is prudent for them to construct a health plan that meets their needs over their lifespan, even if it is actuarially unfair during any slice of time. Each person is then treated the same way over a whole life. They pay for more healthcare than they receive early in life when their healthcare needs are lower, but they receive more services than they pay for when they need them more later in life.

The simplifying assumption that we all age ignores the inequality in longevity across persons, which can create some inequity across groups that systematically differ in lifespan. But the scheme abstracts from those differences and aims to treat people equally, even if they are treated differently at different ages. The scheme also abstracts from the behaviours that arguably impact our health as we age. Attention must be paid in designing institutions so that these abstractions and simplifications, including the assumption that rules remain stable over a lifespan, do not lead to serious inequities.

To build on this claim that the prudent allocation of a resource over the lifespan can serve as a model for fair treatment of age groups, we need to make some further assumptions that assure us of impartiality. Rather than making assumptions about the reasoning of fully informed individuals – the traditional approach of economic agents deliberating about prudent choices – we need to blunt the bias that might result from people knowing how old they already are. Imagine, then, people deliberating about the tradeoffs they might be willing to make in healthcare (or education, or some other good) over a lifespan, provided they assume they will live through each stage of the life.[20]

Healthcare we give to ourselves when we have a cancer late in life will then involve a tradeoff with healthcare we give to our mothers prenatally or to ourselves in childhood, assuming we have a lifetime budget for healthcare. Of course, prevention in early, middle and late years can lead to a healthier life later, so we have to know what the effects of tradeoffs really are. If we want to improve our chances of living a normal lifespan by investing in preventive care early in our lives, we have to be willing to trade away some care we might give ourselves late in life.

The point is to think about our needs at each stage of life, while assuming that we have some constraint on resources devoted to healthcare (or to health policy more generally). The tradeoffs that we would accept across stages of our lives because we think they improve our lives will then count as fair treatment. Prudence in this way is a rough guide to fairness across age groups, assuming (contrary to fact) that we have equitable lifetime shares of various goods.

Admittedly, this is a very abstract way to think about equity across age groups. In its defense, it is an abstraction that is motivated by the difficulty of getting one age group to see things from the perspective of another age group. It tries to substitute the view that we age over the lifespan, and so we should think about what makes life as a whole better for us rather than thinking about "us" now versus "them" now.

But the abstraction is unrealistic in other ways. Many countries do not have a global budget for expenditures on health, and so the very thought of designing lifelong packages of health benefits may seem completely unrealistic. And, of course, we not only know how old we are, but we also know that our lifetime shares of various goods are not really equitable. Nevertheless, even though prudence is not, in general, a good guide to thinking about fairness across persons, it may give some guidance to thinking about the age group problem. (This chapter will return to a further complaint about prudence.)

The appeal to prudence is only a heuristic for thinking about a hard problem. It may mislead us when some of its assumptions are not realistic, but it may also give us some insight into hard questions. For example, there may be services such as day-care centers for the elderly that benefit us at various stages of life – when we are adult children who need to work while not leaving our elderly parents uncared for, and later when we are those elderly parents. The appeal to prudence may help us think about revising old patterns. If our lives are much longer than they typically used to be, and if job structures are less stable, then maybe we need more adult education than has been traditionally provided.

Further Objections

Even if we can forgive the Prudential Lifespan Account for its abstractness and its obvious departures from real world conditions, it faces some further objections. For one thing, it seems to provide an integrated solution to the age-group and birth-cohort problems only under some conditions – an expanding or stable population, with at worse temporary population bulges. It does not work as well under conditions when there is a shrinking population.[21] Unless a shrinking population can steadily increase its productivity, it will be unable to provide rough equality in benefit ratios to successive cohorts. Yet another objection is political. As cohorts age and become politically more powerful, they may modify the rules to serve themselves and so undermine the assumption that the approach can tell us how to construct a stable and fair solution to the age-group problem.[22] These objections point to potential limits to the use of the account.

There are, furthermore, some deeper issues that point to objections to the use of the approach. One of these is ethical: the Prudential Lifespan Account allows us to ration certain services if doing so is prudent, and this may allow rationing of lifesaving services purely by age under some conditions of scarcity.

For example, suppose a lottery for scarce organs that allowed all age groups to compete on equal terms was judged less prudent than a lottery that excluded people older than normal life expectancy (the latter would increase a winner's chances of living to a normal life expectancy compared to the former; this is judged prudent). Some people find such rationing purely by age ethically unacceptable, so this implication of the Prudential Lifespan Account makes it ethically problematic.[23]

But if pure age rationing is never acceptable because we must never treat people differently at different stages of their lives, then we may have to overlook the benefits that may come from differential treatment, and that stance would need justification. Others hold a version of a "fair innings" view that gives a more general priority to the young over the old for lifesaving efforts.[24],[25],[26] For them, the Prudential Lifespan Account is not systematically age-biased enough.

One further objection to the Prudential Lifespan Account is that reasonable people will disagree about what counts as prudent, just as they do about what counts as fair.[27] Ordinarily, this creates no problem for appeals to prudence, because we generally think of prudence as working within a particular life. If different people have different preferences, then what makes each of their lives go best will differ, given their preferences and some lifetime share of resources.

The Prudential Lifespan Account, however, aims for a shared social solution to a problem of prudent allocation; for example, one that tells us what allocation of healthcare resources over a lifespan makes "our" lives go better. The problem is that we may after all disagree about that, and yet we need a socially acceptable and shared solution to the issue of what we owe each other over the lifespan.

Some might think that maximizing life expectancy is what a prudent allocation requires. Others may think their life goes better (is more prudent) if it is shorter but has other qualities instead. So the objection is that we cannot simply assume there is full agreement about what counts as prudent. Specifically, although maximization of some quantity, such as life expectancy or welfare, is what makes our formal models of prudence manageable, that may not reflect a more nuanced account of what is prudent.

This objection has force. One response to it would be to make the Prudential Lifespan Account more complex by adding to it a fair, deliberative process for resolving disagreements about what counts as prudent. Arguably, such a form of procedural justice is already needed to resolve pervasive disagreements about what counts as a fair allocation across persons. Arriving at a social judgment about prudent allocation thus turns out not to be as simple a task as it might have seemed, but it is no more complex than other things we have to do in order to make decisions that are both legitimate and fair.

Conclusion

The Prudential Lifespan Account suffers from abstractness, simplifying assumptions that idealize it, and from some unavoidable complexity. Nevertheless, it has important strengths. Three are worth noting.

First, we cannot arrive at a just or fair policy that aims to be equitable to all age groups and birth cohorts unless we adopt a longitudinal view. Such a view makes us think about needs and contributions people make to a common goal over a lifespan. In effect, this pits the search for just policy against an important political tendency. Politics tends to root decisions in the bargains people can make at a moment when they act as individuals with very specific needs and interests.

Just policy must have a long-term, longitudinal view, even if politics is embedded in the demands people make at a moment. Because of this tension, searching for a just policy involves needed criticism of political forces, even as politics constrains the formation of policy. The message, however, is clear. A longitudinal perspective – some development of the Prudential Lifespan Account, perhaps – is needed to secure equity across generations.

A second strength of the approach is that it focuses attention on a common problem: fair distribution over the lifespan. In this way, it reminds us that different cohorts and age groups must cooperate to solve that common problem. All have a common stake in such a policy.[28] Such cooperation, then, means sharing risks across cohorts – risks of volatility in the economy, of demographic shifts in cohort size, and of tension with the political forces of the moment.

The alternative, namely trying to put each cohort on its own economic and social footing -- sometimes seen as a virtue of privatized savings schemes rather than inter-cohort social compacts about transfers -- only appears to "solve" the problem of equity across cohorts. In fact, it substitutes the vagaries of good and bad fortune – good timing in earnings and retirement – for a goal of fair treatment, which involves some risk sharing. The idea is to insure ourselves against the bad fortune of being in the wrong cohort at the wrong time. Such insurance is by design redistributive, but that is what fair treatment of age groups and birth cohorts means. The Prudential Lifespan Account thus affirms that fair treatment of all groups over time requires a social contract or compact across cohorts.

A third strength of the approach is the way in which it forces us to think more broadly about both needs we have and contributions we can make across the lifespan. It helps us see that ageing societies, for example, may have health needs not encountered in younger societies. Compression of morbidity may make this less demanding over time, but the elderly also have potential for great social contributions that cannot be achieved if institutions and practices block their delivery.

An important point of much of the gerontological literature is that our institutions – job structures, career incentives and education patterns – can be modified to improve the contribution that older people make to our social life and, at the same time, improve the adaptability of younger cohorts to changing life plans. In many rural, agricultural settings, contributions from the elderly were possible that are difficult in industrialized settings, at least with standard job structures.

Finally, in many earlier societies, the elderly provided a kind of social wisdom aimed at the common good. In our societies, we have fragmented populations into advocacy groups for narrower interests, such as the elderly. The Prudential Lifespan Account has the virtue of aiming to unify goals across the lifespan. That perspective may help undercut the advocacy by vested interests that is so much part of our shortened time perspective in policy.

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II. Investing in Ourselves: How to release social capital

Chapter 6
Population Ageing: Macro Challenges and Policy Responses

David E. Bloom, Axel Börsch-Supan, Patrick McGee and Atsushi Seike

The world's population is growing older, leading us into uncharted demographic waters. There will be higher absolute numbers of elderly people, a larger share of elderly in the overall population, longer healthy life expectancies and relatively smaller numbers of working-age people. These trends, some of which are amplified by declining fertility rates, are affecting nearly every country. At the global level, the number of those over age 60 is projected by the United Nations Population Division to double from just under 800 million today, representing 11% of world population, to just over 2 billion in 2050, representing 22% of world population.

There are alarmist views, both popular and serious, being voiced that an ageing population will spell trouble for business and economic performance. But is this the case? Our research suggests that the economic consequences are not likely to be overwhelming for several reasons:

- The number of young people as a share of the total population will be declining, especially in developing countries, a development that will tend to counterbalance the movement of large cohorts of working-age people into their older years. This trend will mitigate a decline in the working-age share of the population.
- As large portions of the older population become healthier, some people – especially those not doing manual labour – will be able to work until later in life.
- If current trends continue, women will participate in the labour force in greater proportions.
- Markets for goods, services and labour are likely to adjust naturally to changes brought about by an evolving age profile; for example, with a greater substitution of capital for labour and with more development and use of labour-saving technologies.

The bottom line is that the challenges raised by an ageing population are formidable, but not insurmountable. Collectively, we can affect the outcome. The key will be adaptation on all levels: individual, organizational, and societal. This chapter explores some potentially useful responses from governments and businesses.

Population ageing poses many challenges for the operation and financial integrity of healthcare and pension systems, and the wellbeing of the elderly. It has also sparked concern about the pace of future economic growth.

Workforce Size and Quality

When it comes to economic prosperity, the size and quality of the workforce are critical. Yet as people pass through their 50s and beyond, their likelihood of participating in the labour force tends to decrease. The stock of assets could also fall as the elderly increasingly rely on their savings – what is known as "dissaving" – to finance spending. This combination raises concerns that the steeply ageing countries will experience slower economic growth,[1] and for some, even an economic shrinkage.

However, a recent study argues that such worries are overblown.[2] It is true that the global labour force participation rate (LFPR) – the ratio of the global labour force to the population aged 15 and over – has been declining since 1960 and is expected to fall another 4.4 percentage points from 2005 to 2050 (Table 1). Part of this change can be attributed to population ageing. But because of falling fertility rates, especially in developing countries, the labour force as a share of total population (LFTP) has been increasing and is expected to rise by about 1.9 percentage points from 2005 to 2050. Moreover, the actual increase might even be greater, given that this projection does not account for the likely boost of lower fertility to female labour force participation.[3]

Table 1: Labour force worries may be overblown

(Global labour force: 1960, 2005, and 2050, in per cent)

	1960 Actual	2005 Actual	2050 Projected
LFPR (labour force/pop 15+)	67.4	65.8	61.4
LFTP (labour force/total pop)	42.3	47.1	49.0

Source: Bloom, Canning, and Fink (2010).

Note: The projections assume that each country's age and gender labour force rates in 2005 remain constant and apply them to projected demographics in 2050.

The key point is that the increase in elderly dependents will be more than offset by a decline in youth dependents. And this offset suggests that population ageing does not pose an imminent economic crisis for the world. Thus, one of the most widely cited fears about population ageing – that there will be a crushing rise in elderly dependency unless the labour force participation of the elderly drastically increases – appears to be unfounded for the world as a whole, notwithstanding steep rises in particular countries such as Italy and Japan.

For Organisation for Economic Co-operation and Development (OECD) countries that already have low fertility rates, such as Germany, labour force participation rates at old age are also typically low. Ironically, such low participation rates provide a chance to counter the negative economic effects of population ageing. This is because they leave considerable scope to increase a population's total labour force participation by taking steps to encourage people to retire later.[4] Indeed, labour force participation among the elderly has increased recently in many OECD countries, including Japan.

Chronic Diseases

Population ageing also signals the advent of a tidal wave of chronic diseases (non-communicable diseases, or NCDs), which are currently responsible for roughly 60% of all deaths and nearly half of the loss of actual and effective life years owing to disability and death.[5] They strike a wide segment of the global population, from high-income to low-income countries, and from young to old. The most important ones are cardiovascular disease, cancer, chronic respiratory disease, diabetes and mental health conditions (including Alzheimer's). Many of the leading chronic diseases share four modifiable risk factors – tobacco use, physical inactivity, unhealthy diets and the harmful use of alcohol – and one non-modifiable risk factor, which is age.

Especially concerning is the fact that many people living with chronic diseases are undiagnosed, which often results in later and more costly treatment. Treatment and care costs tend to be relatively high for chronic diseases, with the prospect of even greater costs as expensive new medical technologies are introduced and access to public healthcare becomes increasingly universal. To counterbalance these cost increases, expect to see a greater emphasis on disease prevention, including the spread of workplace wellness programmes. Business ingenuity and effort may also be expected to usher in a wave of more healthful products and services.

Although worries about the economic impact of chronic diseases are only beginning to register on the radar of economy policy-makers, such concerns are front and centre for business leaders. In the World Economic Forum's 2010 Executive Opinion Survey, which feeds into its Global Competitiveness Report, business leaders were asked about the expected effects of chronic diseases on business performance in the next five years. The survey mentioned possible impacts stemming from death, disability, medical and funeral expenses, productivity and absenteeism, recruitment and training expenses, and revenues. The results were striking. Over one-half of respondents expect that chronic diseases, taken together, will have a serious, somewhat serious, or moderate impact on their company, and nearly one-third expect the impact to be more than moderate. These chronic disease concerns are markedly higher than those about the communicable diseases of HIV/AIDS, malaria and tuberculosis.

Asset Prices

Another concern centres on the potential effect of population ageing on asset prices. Specifically, some observers warn that asset prices will fall as the elderly sell off their assets, known as an asset meltdown. This type of worry is not new. Some analysts predicted asset meltdowns in housing markets because of decreased demand from ageing members of the post-World War II baby boom generation.[6] Fortunately, this and other dire predictions have proven overly pessimistic. Moreover, mitigating factors such as the potential for policy change suggest that there will be a rather moderate effect on asset prices.[7,8]

Pensions

Population ageing also raises questions about the viability of various types of pension systems. Publicly funded pay-as-you-go (PAYG) pension systems face serious issues, as the number of beneficiaries will increase while the number of contributors will decline. Fully funded systems, which lie at the other end of the spectrum of pension options, are not necessarily a panacea because they need a long time before they can deliver substantial pensions. For the baby boomers who have not saved so far, it is simply too late to accumulate sufficient funds. When such systems are voluntary, they suffer from procrastination; at the same time, mandatory funded systems can be prone to vexing issues of governance, especially because there are so many options for fund management and the returns can be highly uncertain. A mix of PAYG and fully funded systems may be the solution to minimize risk.

Some countries, such as Germany and Sweden, have successfully solved their pension problems by effectively converting their defined benefit systems into a special form of defined contribution systems, where actual pensions depend on the ratio of workers to retirees, augmented by a compensating funded system.[9] The Swedish system relies explicitly on "national defined contribution" accounts. In Germany, the defined benefit formula was amended by a "sustainability factor" that reduces the annual pension increase in proportion to population ageing. Other countries have mimicked both types of pension reform. Switzerland has taken the unusual step of allowing a pension fund to be established for a child when he or she is born. Efforts to raise the statutory retirement age are also under way in most developed countries, although they are often highly contested and accompanied by popular protests.

Conclusion

Public policy-makers and the business community are just beginning to acknowledge the coming acceleration of population ageing. Thus far, there has been little need for rapid policy changes because population ageing has been slow and large baby-boom generations have been fuelling business activity and economic growth. But the need for policy adaptations will become more important in the face of baby boomers retiring, labour force growth slowing, and the costs of pension and healthcare systems rising, especially in Europe, North America and Japan. Businesses will soon have little choice but to be more attentive to the needs and capacities of older employees. Or to put it on a more positive note, their ability to adapt could become a source of competitive advantage.

What can be done on an economy-wide scale? Responses to longer lifespans will require a series of reforms to public policy and business practices that will supplement the effects of changes in markets for goods, services and labour, which are likely to take place automatically.

Public Policy

Allowing people more freedom of choice regarding the timing of retirement is a good starting point. While life expectancy in 43 selected countries, most of which are developed, rose an average of nine years from 1965 to 2005, the average legal retirement age rose by only about six months.[10] Various industrial countries have recently raised the normal legal retirement age. But while these changes have been generally accepted in some countries (such as Germany and the United States), they have led to significant social conflict in others (such as France), indicating that further moves in this direction are possible, but may not be easy.

How can extended working years be encouraged? One way is to remove incentives to retire between the ages of 60 and 65. Another is to adjust tax and benefit policies with the aim of encouraging and capturing the benefits of prolonged careers.

In Japan, the government has been wrestling with these issues because its public pension system still uses an earnings test, which encourages early retirement and part-time work and thus deprives the country of a capable and willing older workforce. Compounding this problem is the predominance of mandatory retirement practices, typically at age 60. In addition, Japanese workers over age 45 seeking new employment are often deterred by maximum hiring ages. However, workers in general still have a strong motivation to continue working after age 60, according to a survey by Japan's Ministry of Health, Labour and Welfare.

To turn the situation around,[11] the Japanese government has started to raise the pension-eligible age from 60 to 65 and to require employers to extend employment to age 65. These steps have had a significant impact, with the labour force participation rate for men aged 60 to 64 increasing from 71% in 2006 to 77% in 2009 – considerably higher than in Australia, Canada and the United States.

In most developed countries, retirement itself is a complex process, often more of a transition, involving early retirement, phased or partial retirement, or "unretirement". Changes in the legal retirement age will interact with this process in complicated ways. In most developing countries, by contrast, the legal retirement age applies in practice to only a small portion of the labour force, and pensions are relatively uncommon. People very often work until they can no longer do so and are then dependent on their children or remittances from abroad.

As for pension reform, which is under way in many countries, it usually takes place "in instalments", which is a slow process of many small steps, and typically with many dimensions: a reduction in benefits, an increase in contributions of the PAYG part of the pension system, an expansion of individual accounts and a gradual change in the statutory retirement age. Policy-makers should keep in mind that well-designed reforms affect the entire system and do not create loopholes, such as through disability or unemployment insurance, that can discourage work. In addition, index schemes, such as linking benefits to the dependency ratio and retirement age to life expectancy, can reduce political opposition.

Financing healthcare systems is extremely problematic in many countries. For example, in the United States, where healthcare coverage is still not universal, there is considerable proclivity to use expensive new medical technology, and third-party payers account for a significant portion of healthcare spending. New financing systems will have to account for the greater healthcare needs of the elderly, especially in light of their increased numbers and older ages, and the continued development of expensive new medical technologies.

Given that NCDs are responsible for such a huge slice of healthcare, it is fortunate that there appear to be many options available to prevent and control these diseases. The World Health Organization has identified a set of interventions it calls "best buys".[12] These include higher taxes and advertising bans on tobacco and alcohol, reduced salt intake, enhanced screening and treatment before diseases progress and public information campaigns. In addition, the Forum's 2010 Executive Opinion Survey shows that businesses in both high- and low-income countries are already carrying out an array of programmes related to smoking, alcohol, exercise, stress reduction and physical health.

One possible option for both sending and receiving countries is migration of working-age people to ageing societies. However, unless people work longer, huge numbers of immigrants would be necessary to compensate for population ageing,[13] and such numbers would likely face enormous political and social opposition by the electorates in Europe, and to a lesser extent in the United States. Immigration is therefore unlikely to be a significant contributor to the problems posed by population ageing.

Japan is an interesting case in this regard. Despite its long history of anti-immigrant feelings, a consensus has now developed in favour of greater immigration of skilled foreign workers. Indeed, the number of professional workers from abroad has been rising, though the pace has been a bit slower than expected. Recently, Japanese companies have started increasing the recruitment of international students from both foreign and Japanese universities.

However, the case for unskilled foreign workers is more difficult because of worries about the effect on domestic workers' wages and the danger of creating a dual labour market—and thus eventually a dual social structure, with the tensions that implies. It may be possible to overcome these problems by paying careful attention to the extent and timing of labour market openings, enforcing labour standards (including minimum wages), ensuring that social security applies to all workers and providing subsidies or other incentives for employers to adequately train foreign workers and avoid trapping them at the bottom of the labour market.

Business Practices

To adapt and possibly benefit from an increasingly aged world, businesses must shift organizational structures and practices in a number of areas.

- Attitudes
  Older workers are sometimes seen as a burden, so younger candidates are often preferred in recruitment decisions. But in an economy where knowledge rules, the experience of older workers grows in value and they can serve as role models for younger workers. Employer surveys commonly reveal that workers over 60 are seen as more experienced, knowledgeable, reliable and loyal than younger employees. Practice should match that perception, which has occurred to some extent in smaller firms.

- Work Schedules and Routines
  Older employees who wish to keep working may demand flexible roles and schedules. Allowing more part-time work and telecommuting will entice older workers to stay on, extending their careers by placing lighter burdens on their stamina. Likewise, allocating demanding physical tasks to younger employees will produce a similar benefit and may potentially reduce healthcare costs arising from workplace accidents.

- Training
  Ongoing training will help older workers master new skills as the economy changes. Moreover, longer working lives for employees allow firms to benefit from greater productivity gains from past training investments. A higher legal retirement age can expand these benefits.

- Healthcare
  Investing in the health of all employees enhances productivity and avoids unnecessary costs as the workforce ages. Worker wellness programmes produce healthier employees at all ages; onsite clinics save workers time and focus care on prevention and early disease detection, further lowering costs.

- Pay Systems
  Moving from pay systems based on seniority to ones that are based on performance will invariably lead to a relaxation of corporate norms surrounding the retirement age. This has already occurred in many countries, including in the public sector. Careful thought and skilful negotiation will need to go into such a transition to ensure economic soundness, fairness and political support. Moves in this direction have already taken place in Japan, with the age-based wage profile becoming less steep in the past two decades.

In designing business organizations of the future, the private sector – with appropriate public-policy support – should anticipate, rather than passively await, this trend towards longer lifespans and older employees. In one example of business opportunities spurred by ageing, media companies are hoping to profit from ageing viewers and readers by shifting their target away from the traditional range of consumers aged 18 to 49.[14] Although some adaptations lie on the more distant horizon, others can be undertaken right now, to the benefit of both younger and older employees, firms and society.

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Chapter 7
Social Capital, Lifelong Learning and Social Innovation

Simon Biggs, Laura Carstensen and Paul Hogan

That the world's population is ageing is by now well known. What is less well recognized is that this constitutes a cultural as well as a demographic phenomenon. Perceptions of older adults, particularly in the mature economies, are often negative. Older adults are seen as a burden on society, rather than an achievement. This view ignores the social capital held by older adults – accrued knowledge and experience, understanding of the ways things interact with each other, and an ability to place single events in their wider perspective.

Given the right environment, including access to updated skills through lifelong learning and to age-friendly environments, older adults can contribute to innovations that will be necessary as societies learn to adapt. These abilities are often different in degree – rather than less valuable – to those of younger people, yet involve important skills in a world where seemingly different elements of a problem interconnect.

This chapter outlines the new but growing response to adult ageing that identifies ways of releasing the social capital made available by having more people with longer lives. Society needs to first address two major challenges if it is to fully capitalize on the social capital, learning and innovation provoked by ageing populations: first, how to tap into a source of accrued social investment that is currently largely unused; and second, how to recognize that the process of adaptation – a hallmark of the ageing process – is itself a significant source of innovation and of business opportunity.

The social capital of older adults is often unrecognized, yet represents a reservoir of accrued investment that has yet to be fully drawn upon. The maintenance and germination of this form of capital depends upon a positive relationship between lifelong learning, social innovation and adaptation. It also requires recognizing areas in which older adults have specific skills and aptitudes. The role of negative social attitudes in inhibiting the utilization of accrued capital would also be an important consideration as would be the recognition that successful utilization depends upon intergenerational negotiation. One of the most important social innovations – learning to live in an age-diverse world – would have many productive spinoffs in such arenas as design, retail, workforce participation, cultural adaptation and getting the balance right between continuity and change.

The Social Capital of Mature Adulthood

The social capital contained within older populations is a considerable resource that lies largely unused and, as such, exemplifies a societal failure to adapt to changing circumstances. Currently, the perception of older adults' potential contributions to society is changing rapidly.[1] A number of factors have contributed to this, including the expectations of older adults themselves and their direct and indirect economic contribution that goes beyond demographic change to embrace social and behavioral change.

Engaging with these positive contributions will require efforts to: create an ethic that recognizes older workers are in fact capital to be leveraged; instill in older workers a recognition that they are vital and have much to offer; stimulate a societal appetite to employ and educate older adults; and envision a new cultural paradigm for a productive life.[2] Later life is often erroneously assumed to describe a state of continuous decline. However, proprietary research done in 2010 for Home Instead Care showed that 62% of men over 85 report no limitations to daily living. Among the educated and affluent, the picture improves even more.

Further, there is little evidence that younger generations resent the continued participation of older adults. The Marist Poll Organization discovered that 60% each of the Millennial and X Generations are not worried about older workers not retiring from their jobs. In fact, 62% and 65% of these two groups, respectively, felt that they should be encouraged to continue working as they reach retirement age. In addition, because mature adults have often been freed from the care of dependent children, they may be an especially good resource. Positive changes that occur in social skills may make them particularly well suited for jobs that require social connection.

Confronting the Myths of Lifelong Learning and Development

Myths and stereotypes about older people contribute to widespread pessimism about ageing societies.[3] This pessimism can be reinforced by researchers and policy-makers who are influenced by these same preconceptions in the way they describe and respond to ageing trends. For example, the US Federal Interagency Forum on Ageing-Related Statistics recently reported that in the US, 42% of people over 65 have at least one functional limitation.[4] This statement reinforces perceptions that older people are a burden and need support.

When described in this way, this information might lead to the development of more effective systems of care, or even better, health promotion. However, if viewed another way, this data indicates that the other 58% are not functionally disabled. If presented from this perspective, the information may lead policy-makers to consider ways of ensuring that older people can continue to participate in and contribute to society.

Underutilizing talented, able and willing citizens is bad for older people and for societies. For example, consider cognitive functioning. Behavioural scientists have characterized cognitive decline with considerable precision. Changes begin in the early 20s, and continue at roughly the same rate into the 80s, 90s and 100s, and the balance in strength changes from information processing to the deployment of accrued knowledge.[5] Nonetheless, in the absence of dementia, age-related changes in cognition do not prevent people from learning, nor do they significantly cloud thinking.

Far less attention is paid to components of cognitive processing that are not characterized by trajectories of decline. Not all types of memory decline. For example procedural memory, or memory of how to do things such as ride a bike or type on a computer keyboard, is barely affected, if at all, by ageing. Even though new learning is somewhat degraded, learning continues over the years. Knowledge and expertise in specialized areas continue to improve over time. Vocabulary and cultural acumen tend to increase well into old age.[6] People over age 50 are also more informed about politics and world affairs than are younger people.[7]

Motivation and emotion change with age as well, and changes in these domains afford greater stability and composure.[8] In youth, when the future is typically perceived as vast and uncertain, people are motivated to expand their horizons, acquire information and prepare for all sorts of possibilities. As people age, motivation shifts. They become more interested in investing in the people and projects that matter most to them. There is a desire to make a difference, using acquired expertise.

In the absence of disease, learning continues throughout life. Generational intelligence, or the ability to put oneself in the place of other age groups and to negotiate difficult interpersonal situations, increases.[9] Further, the experience of emotion changes, in part because of these motivational changes. Mature adults are more likely to let small problems go, so they can be better at solving emotional conflicts.

How do these changes affect work performance? Meta-analyses of the existing literature comparing older and younger workers show very little evidence for declines in productivity or performance.[10] True, existing studies focus on relatively "young" older workers. But by and large, work performance is well maintained. Further, working into mature age has been shown to be a win-win situation, with mature workers continuing to improve their cognitive functioning. Older workers are more collaborative and often use better judgment. Especially when work holds emotional significance, older people take remarkable initiative.

In Japan, for example, hundreds of elderly people stepped forward to work at the Fukushima nuclear reactor plants. They maintained that long-term cancer risks and potential loss of fertility were not issues for them, given their age. Their emotional resilience in the face of the recent disaster is offering practical solutions and generating great national pride.

These patterns present numerous workforce opportunities. Some businesses have sought older workers when this demographic could offer the best skills and experience for the jobs at hand. For example, Home Instead Senior Care (2011), a leading international provider of in-home care to older adults, employs more than 20,000 caregivers who are at least 60 years old. With increasing international concern about the availability of an aged-care workforce, older workers are becoming an asset. [11]

This type of business-related social innovation has the potential to become a self-perpetuating phenomenon. As older employees stay in the workforce longer, they may help shape the work-related attitudes of their younger colleagues, who themselves represent future generations of older workers.

An Adaptive Approach to Lifelong Learning

An adaptive approach to lifelong learning means that we now need models that place revolving doors in universities, offering sabbaticals to workers throughout life for retraining or for pursuing new skills for the same job. Part of this adaptation will need to concentrate on aptitudes that may be enhanced with maturity, such as big-picture thinking, attitudes to risk taking, cultural know-how, negotiation and social skills, and awareness of the effects of change over time and of cultural continuity.

There are at least three issues involved here. First, the training needs of older adults tend to be overlooked, in the mistaken belief that their ability to learn has been significantly reduced.[12] Second, by recognizing the accumulated knowledge, experience and continued ability to learn of those who are in mature adulthood, accumulated social capital can be used more effectively.[13] [14] Third, learning needs to be tailored to the life priorities and thought processes of older adults and to working in intergenerational contexts.[15]

Formal training is one component of this, but it also requires an "ethic" which has a bias for optimizing and developing lifelong learning. Social capital is both an explicit (skill and knowledge accrual) and implicit (cultural and adaptation experience) source of accrued investment. It requires training and continual updating for its value to be fully realized.

Social Innovation for and by an Ageing Population

As people begin to plan for a long life and businesses need to attract older workers, these forces will themselves become a motor for innovation and the creation of new social relationships. Social innovation can occur for older adults and by older adults. An ageing population offers novel design and product opportunities, in marketing redesigned products to fit the demands of mature customers,[16] creating age-friendly environments[17] in the use of information technologies,[18] and changing workplace design, such as in the BMW production line programme.[19] Older adults often engage in second, or encore, careers and may be an important source of small- and medium-size business innovation.[20]

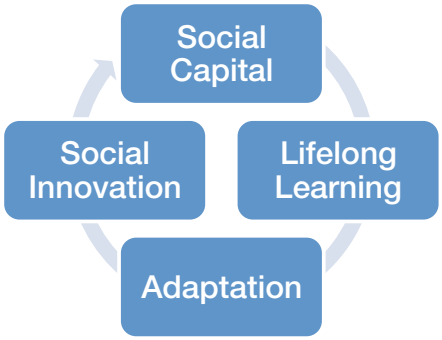
The innovative step is to discover or recognize social roles that can accommodate activities that will work intergenerationally, be in harmony with changing life course capabilities and contribute to productive social engagement.[21] And this may play an important role in achieving sustainable workability for an ageing yet intergenerational work environment.[22]

To capitalize fully on the capabilities outlined above, new models of lifelong work practices that prioritize flexibility are becoming increasingly popular. Accepting that older workers have unique strengths that can be capitalized in the right environment leads to workplace adaptation, rethinking disincentives and incentives to further contribution, breaking stereotypes and negotiating. Shared intergenerational outcomes are becoming increasingly important sources of innovative adaptation for an ageing society. With their maturity, perspective and experience, older adults can make their contributions in thought, feeling and social skills and in ways less dependent on physical activity – in line with business innovation and knowledge-based economies.

Below, we outline a virtuous circle that taps the reservoir of accrued social capital, channeled by lifelong learning, and allows new and effective adaptations to grow. The circle is virtuous because it generates social innovation and sustains the continuing germination, development and release of social capital.

Here, social capital provides a wider vision of the productive contribution of older adults. It recognizes both the diverse contributions of different age groups and the work that goes into sustaining a viable social fabric necessary for sustainable economic engagement.

Figure 1: A virtuous circle relationship between social capital, learning, adaptation and innovation



In this model, social capital is unlocked via appropriate learning and education. This unlocking allows adaptation to take place, both for mature-age workers and between generations, so that the best mix of age groups for a collective task can be found. Adaptation would result in the two forms of social innovation described in this chapter: innovation by mature adults and by a society friendly to all ages.

- Social capital refers to accrued content (such as knowledge and information), process (understanding of the ways things interact), and experience (placing single events in a wider perspective).
- Lifelong learning refers to the models or ways in which knowledge and skills are communicated, the environments (where and at what time) that foster age-friendly accessibility, and the institutional adaptation to the "stretched life course" where work, learning and self-development extend across a longer, fitter life.
- Social innovation includes the adaptations that are provoked by a changing demographic landscape. It can include innovative activities by older adults themselves, business and service innovation to meet newly identified needs, and innovation provoked through the meeting of shared generational goals.
- Adaptation – keeping up with changing demographics and ageing identities – requires a change in ageist attitudes, the development of age-friendly (including intergenerationally) cultures, and redesign of large areas of commerce, workplaces and the built environment.

A number of organizations are beginning to collect examples of the use of the social capital of older adults. Arguments for and particular instances of age-diverse workforces and intergenerational innovation can be found at the websites of Eurofound, Experience Corps, the AARP and Employers Forum on Ageing cited in this chapter's reference section.[23242526]

Conclusion

Demographic change will have an influence that is widespread and will challenge many assumptions about the contributions of older adults. It will affect processes of production, consumption and the environment in which we all live and work. If societies are to adapt, steps will need to be taken to release the social capital that is locked up in their older citizens. This potential would include the application of accrued social and emotional intelligence, an understanding of the ways things interact with each other and an ability to place single events in their wider perspective.

Given access to updated skills through lifelong learning and through age-friendly design, older adults can contribute to new forms of adaptive innovation. In fact, a combination of lifelong learning and social adaptation can drive innovation. It leads to a virtuous circle, releasing further social capital in a way that is imminently suited to a world needing new ways to interconnect.

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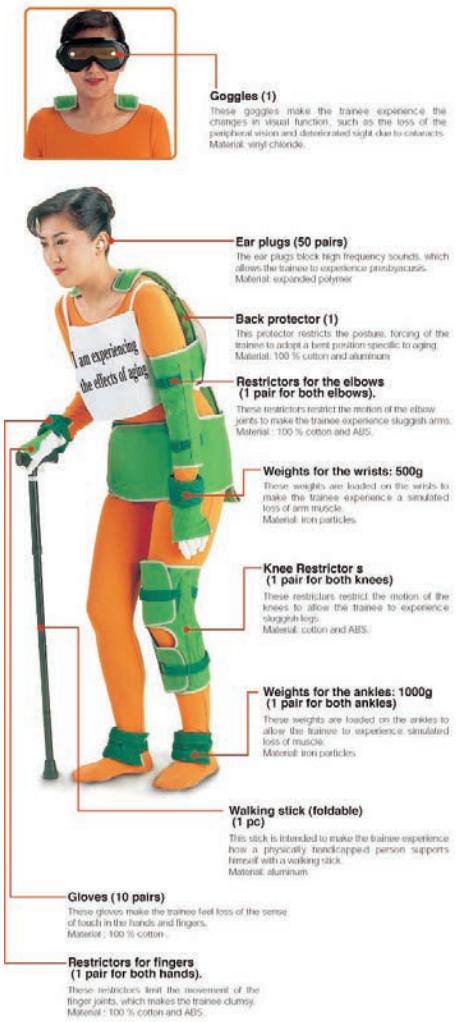
Chapter 8
Leadership: The Elders

S. Jay Olshansky

As a way to illustrate to young people what ageing is like first-hand from the perspective of an older person, a company in Japan created the Aged Simulation Set – a series of restrictive devices designed to "demonstrate the inconveniences felt by the aged due to musculoskeletal, visual and auditory ageing".[1] (See Figure 1.) Features of the set, which the manufacturer says emulates the daily life of the aged, include goggles that narrow the field of vision; earplugs to restrict sound; and Velcro restraints designed to make it difficult to bend the joints, move up and down stairs, stand up, sit in a chair and use the bathroom.

Scientists at the University of Minnesota created a similar experience to sensitize medical students to the unique needs of elderly patients, with the goal of reducing widespread negative attitudes toward ageing and the care of elderly patients.[2]

Figure 1: The Aged Simulation Set



Source: The Koken Aged Simulation Set LM-060[1]

Variable Physical and Cognitive Declines

If these were the only experiences that medical students and young people were exposed to as a symbol of what it is like to grow old, they would most certainly get the wrong impression of the reality of human ageing for many people in the modern era.

A balanced and honest assessment of human ageing first requires recognition that there will inevitably be physical and cognitive declines for everyone as they grow older. However, the degree to which this occurs is highly variable. For many, the declines are debilitating, and the costs of diagnosis and treatment are high. In addition, society is already exacting a heavy financial and social toll for the privilege of living a long life. However, for others, the changes in their bodies and minds that occur with time are little more than nuisances easily compensated for by modern medicine and simple technological advances such as hearing aids, reading glasses and common surgical procedures, such as removal of cataracts.

Serious health issues will no doubt rise in prevalence as the population ages, but it is important to recognize the other side of the ageing coin. A notable percentage of the older population today is physically and mentally healthy, vibrant, sexually active, wanting to work and fully engaged in every aspect of society. In some instances, they are not much different than when they were younger. The prevalence of this healthy and active segment of older populations is going to rise rapidly in this century. However, students wearing the Aged Simulation Set would have no way of knowing this.

Efforts to sensitize younger generations to changes that occur in human bodies with the passage of time may be well intentioned, but this is only part of the story of growing older. Given that many older people are functionally not very different from people decades their junior, the Aged Simulation Set, as an example of what human ageing is like or can be, is perhaps the wrong part of growing older that should be emphasized. Such devices could lead young people and physicians-in-training to believe this is the inevitable fate for their patients, and will be their own destinies as they grow older. The fact is, devices such as these reflect only the negative side of physical ageing experienced by some.

There is an entirely different and much more positive side to ageing that is rarely noticeable to young people as a vision of their future. Examples of the positive side of ageing abound, but this chapter focuses on only one – leadership and the exemplars of this experience known as The Elders.

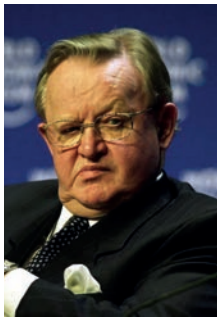
Origin of The Elders

In traditional societies, elder members of clans were viewed as repositories of wisdom and the source of major conflict resolution. In the same spirit, a version of global elders for all of humanity emerged in 2007 following a conversation between entrepreneur Richard Branson and musician Peter Gabriel. The idea was that in an increasingly interdependent world characterized by what might best be thought of as a global village, a small group of independent-minded elders could help to resolve global issues, ease suffering and promote the shared interests of all of humanity.

Branson and Gabriel approached Nelson Mandela, who agreed to support the idea, and with the help of Graça Machel and Desmond Tutu, brought The Elders together. Current members of The Elders, in addition to those already mentioned, include Martti Ahtisaari, Kofi Annan, Ela Bhatt, Lakhdar Brahimi, Gro Harlem Brundtland, Fernando H. Cardoso, Jimmy Carter and Mary Robinson. Aung San Suu Kyi is an honorary Elder and Muhammad Yunus is a former Elder. Brief biographies of current and former members of The Elders appear below.

Graça Machel, 66, is a politician and humanitarian from Mozambique who has been an international advocate for women's and children's rights. She is the wife of former South African president Nelson Mandela and the widow of the late president of Mozambique Samora Machel. In 1997 she was made a British Dame for her humanitarian work.

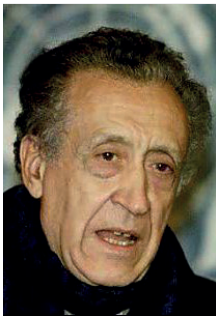
Desmond Tutu, 80, is an activist and retired Anglican bishop from South Africa, well known for his opposition to apartheid. Tutu has been an active defender of human rights, and has fought against AIDS, tuberculosis, homophobia, transphobia, poverty and racism. Tutu received the Nobel Peace Prize in 1984, the Albert Schweitzer Prize for Humanitarianism in 1986, the Pacem in Terris Award in 1987, the Sydney Peace Prize in 1999, the Gandhi Peace Prize in 2005 and the Presidential Medal of Freedom in 2009.



Martti Ahtisaari, 74, is a Finnish politician who served as the 10th president of Finland from 1994 to 2000. Ahtisaari was a United Nations diplomat and mediator known for his international work on peace. Ahtisaari was a special envoy to the United Nations at the Kosovo status process negotiations that were designed to resolve a long-running dispute in Kosovo. In October 2008, he was awarded the Nobel Peace Prize for decades of work to resolve international conflicts in Namibia, Indonesia, Kosovo, Iraq and other areas.

Kofi Annan, 73, is a Ghanaian diplomat who served as the seventh secretary-general of the United Nations from 1997 to 2006. Annan and the United Nations were the co-recipients of the 2001 Nobel Peace Prize for founding the Global AIDS and Health Fund.

Ela Bhatt, 78, is the founder of the Self-Employed Women's Association of India (SEWA). Trained as a lawyer, Bhatt is a respected leader of the international labour, cooperative, women and microfinance movements.



Lakhdar Brahimi, 78, is a former envoy and advisor to the United Nations, a member of the Global Leadership Foundation and the Commission on Legal Empowerment of the Poor, and the former chair of the Panel on United Nations Peace Operations. He is currently a distinguished senior fellow at the Centre for the Study of Global Governance at the London School of Economics and Political Science.

Gro Harlem Brundtland, 72, is a social democratic politician from Norway where she served as the prime minister in 1981, 1986 to 1989, and 1990 to 1996. Brundtland is an international leader in sustainable development and public health and has served as the director-general of the World Health Organization. She now serves as a Special Envoy on Climate Change for the United Nations. In 2008, she received the Thomas Jefferson Foundation Medal in Architecture.

Fernando Cardoso, 80, is a former president of the Federative Republic of Brazil who is also trained as a sociologist. Cardoso was presented with the Prince of Asturias Award for International Cooperation in 2000. Cardoso is a founding member of the University of Southern California Center on Public Diplomacy's Advisory Board.

Mary Robinson, 67, is a former president of Ireland. Robinson also served as the United Nations high commissioner for human rights from 1997 to 2002. She was a member of the Irish Senate, honorary president of Oxfam International and of the European Inter-University Centre for Human Rights and Democratisation. Robinson is Chair of the International Institute for Environment and Development (IIED) and a founding member and Chair of the Council of Women World Leaders. She is also a member of the Trilateral Commission and is involved in the project Realizing Rights: the Ethical Globalization Initiative. She is Chancellor of the University of Dublin and is now a Professor of Practice in International Affairs at Columbia University. In 2004, she received Amnesty International's Ambassador of Conscience Award for her work in promoting human rights.

Jimmy Carter, 87, is a former president of the United States. He received the Nobel Peace Prize in 2002, created the Department of Energy and Department of Education during his term in office, and established the first US national energy policy. Carter was involved in the Camp David Accords, the Panama Canal Treaties and the Strategic Arms Limitation Talks (SALT II).

Aung San Suu Kyi, 66, is a Burmese opposition politician and the General Secretary of the National League for Democracy. Aung San Suu Kyi received the Rafto Prize and the Sakharov Prize for Freedom of Thought and the Nobel Peace Prize. She was awarded the Jawaharlal Nehru Award for International Understanding by the Government of India. She was also awarded the International Simón Bolívar Prize from the Government of Venezuela.

Muhammad Yunus, 71, is an economist from Bangladesh and founder of the Grameen Bank, which provides microcredit to help impoverished clients establish creditworthiness and financial self-sufficiency. In 2006, Yunus and Grameen received the Nobel Peace Prize. Yunus is a member of the advisory board at Shahjalal University of Science and Technology and was previously a professor of economics at Chittagong University. Yunus also serves on the board of directors of the United Nations Foundation and was a founding member of The Elders.

Distinguishing Achievements

What distinguishes this group of accomplished people is not so much their age, but their lifetime achievements demonstrating a history of independent thought, international trust, proven integrity and a reputation for inclusive progressive leadership. According to Mandela, "The Elders can speak freely and boldly, working both publicly and behind the scenes. They will reach out to those who most need their help. They will support courage where there is fear, foster agreement where there is conflict, and inspire hope where there is despair".

Examples of their tireless work abound. Consistent with discussion of human rights in Chapter 18 of this book, The Elders actively support the United Nations Declaration of Human Rights originally passed in 1948, emphasizing these rights in every aspect of their work. Although The Elders do not explicitly mention age or ageing when discussing human rights, they do take care to emphasize that the Declaration applies to every human being. The Elders have been actively involved in efforts to eliminate the global stockpile of nuclear weapons, promote equality for women and girls, seek a just and secure peace for all in the Middle East, help to secure the rule of law in Myanmar, battle the humanitarian crisis in Zimbabwe, establish the independence of southern Sudan and reunify the island of Cyprus.

A brief review of past and current activities by members of The Elders demonstrates that these are hardly the actions of a sick, old and frail subgroup of the population that can no longer see clearly, hear, stand up and sit down without pain – as portrayed by the Aged Simulation Test. Nor do they appear to be an economic burden on society.

In a way, even with eyes that probably do not work as well as when they were younger, The Elders perhaps "see" more clearly than ever before. These are the actions of a vibrant, fully engaged group of people, all of whom exemplify the best of what humanity has to offer, regardless of their age. It may even be reasonable to conclude that the measure of success and stature of The Elders exists in part because of the experience and wisdom that each has accumulated during their long careers in public service. The passage of time may very well be the "entrance exam" that must be endured to become part of this unique club.

Are The Elders able to participate in active engagement at their current ages because they have somehow managed to avoid the physical and cognitive infirmities normally associated with older ages? It is clear that none of The Elders is suffering from debilitating mental illness. What is important to remember about The Elders is that they have adapted their lives around their own physical challenges – enough so that they can continue to lead extraordinarily active and creative lives.

The fact that all of The Elders are past the traditional retirement age of 65 is the point. Active engagement in society can occur at the highest levels regardless of age. What sets The Elders apart is not just the fact that they were all accomplished during their younger days, but that they chose to continue, and sometimes even accelerate, their active engagement even while some are facing the typical physical infirmities that accompany most people later in their lives.

Is it possible that The Elders are more able to engage fully later in life because of their high profile positions early in their careers? Perhaps. Certainly their earlier lives allow entrance into this leadership club. Yet there is no reason why people from any profession who reach later ages cannot follow a similar path of senior mentorship and accomplishment.

Other Remarkable Older People

By way of example, until a few days before his death at 83, the founding director of the US National Institute on Aging – Robert Butler – was travelling the globe as a highly sought-after speaker, making substantive contributions at conferences and actively engaged in scientific research and advocacy for ageing issues.

The violinist and conductor Yehudi Menuhin conducted a master class for young students from the Geneva Conservatory of Music near the end of his life. In Sarasota, Florida, retired physicians, who all work for free, run a local hospital almost entirely by themselves. Sir Richard Doll, one of the foremost epidemiologists of the 20th century, was actively engaged in research and lecturing through his early 90s. Health and exercise advocate Jack LaLanne promoted healthy lifestyles and engaged in amazing feats of strength for more than 30 years past what many consider the normal retirement age. He died in 2011, at the age of 96.

There are many more examples of senior "masters" from a broad range of professions, including nursing, banking, writing, teaching, the sciences, construction and plumbing. The fact is that age is not a barrier to active and even enhanced engagement for many. It is not necessary to have been a well-known politician early in one's career to be included among The Elders of our world.

Conclusion

Simulating the lives of older people by focusing exclusively on the physical infirmities that accumulate with age provides a highly biased view of the reality of ageing for most, and the potential for ageing among many. Imagine a simulation device that enables people to experience a profound sense of self-confidence, a level of comfort in his or her own skin, feelings of accomplishment in life, a sense of peace and joy that comes from decades of a loving relationship with a partner, pride in one's children, the sheer joy in caring for grandchildren, financial security from being at the top of one's career earnings, and thoughtful reflection and intelligence. If a pill were invented that enabled us to experience these rewards, everyone would line up to take it – especially younger people.

Although not all of these rewards of ageing exist in everyone, neither is it the case that all of the physical infirmities that appear at later ages are concentrated in every older person. If a person reaches later ages with their health intact, there is really not much to distinguish them from any other member of society, regardless of age.

Leadership is just one of many attributes common in older people that represent a suite of desirable characteristics. Taken together, these characteristics imply that ageing should not be portrayed as decline, loss and decay, but rather as a period of constant adaptation and transitional phases in life that can lead to rewards every bit as valuable and desirable as physical health.

Endnotes

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Chapter 9
Organizational, Adaptation and Human Resource Needs for an Ageing Population

Atsushi Seike, Simon Biggs and Leisa Sargent

Changing demographic profiles create challenges for all sectors of private and public industry, especially in societies where there are projected to be fewer younger relative to mature aged workers. This is the case in the majority of mature and emerging economies, raising the question of how prepared organizations are to adapt. A key component would be to create the best possible circumstances that attract and retain mature-age women and men as a factor in achieving future success. This can also have positive consequences for the workers themselves.

Addressing these challenges would rely on a combination of modifications to the external policy environment, also thought of as macroeconomic change. Modifications would also need to be made to organizations at the mezzo level of individual firms and agencies. The aim would be to promote flexibility within an increasingly age-diverse workplace. Micro or personal changes would then occur as accommodations between these environments and the changing age-based priorities.

Macro adaptation might include promoting employment and pensions conditions that make it desirable to continue working. Mezzo and micro adaptation would rely on the development of age-friendly working environments that allow mature-age workers to participate more effectively. Both require the right balance of continuity and change and a combination of approaches that fit both personal age-based life priorities and wider economic imperatives.

Macro-Adaptation

To cope with an ageing population then, it is extremely important for us to promote the employment of older people. If older people can be encouraged to adopt the will and ability to continue working beyond the current retirement age, it would directly reduce average per capita expenditure and indirectly lead to a number of benefits such as reduced healthcare needs and greater social engagement. An increase in the number of active workers and consumers in later life would also be a driving force of economic growth in the supply side as well as the demand side of the macro economy. However, people should not be forced to work against their will, and in this respect, the important issue is to motivate older people to continue working.

In general, the labour force participation rate declines as populations get older and public policy has focused on keeping it at as high a level as possible. This policy has been promoted, for example following the Lisbon Agenda (2000) within the European Union. In addition, the labour force participation rate of older people varies widely by country. For example, the labour force participation rates of Japanese and Korean elderly in their 60s is significantly high in comparison to other developed countries, such as the relatively low rates to be found in Europe (Table 1).

To achieve greater participation, the Australian Human Rights Commission (www.hreoc.gov.au/age/info_age.html) and the UK-based Employer's Forum on Ageing (http://www.efa.org.uk/) give some useful examples of steps that can be taken. Attempts to motivate continued working have resulted in an often politically difficult review of social security systems and in employment practices in the major European national economies.

Table 1: Employment rates of older workers by % of population aged 55 to 64 across a range of Organisation for Economic Co-operation and Development countries

Country	2000	2009	2010	2010 Country-2010 OECD-Total*
Australia	46.2	59.0	60.6	+6.6
Japan	62.8	65.5	65.2	+11.2
France	29.3	38.8	39.7	-14.3
United Kingdom	50.4	57.5	56.7	+2.7
United States	57.8	60.6	60.3	+6.3
Italy	27.7	35.7	36.6	-17.4
Korea	57.8	60.4	60.9	+6.9

Country 2010-2010 OECD-Total (54%)
Source: OECD Employment Outlook 2011[1]

Pension System Reforms to Promote Employment

Where countries have established pensions systems that encourage early pension eligibility, combined with restrictions on earnings while drawing a pension, this has increased early exit from the workforce. Taking Japan as an example, estimated labour supply functions of older people show that obtaining pension eligibility reduces the probability of labour force participation by 13%.[2,3]

Public pension systems in many countries also include a component that encourages pension-eligible workers to retire or reduce working hours. This is the public pension's earnings test, by which a person's pension benefit is reduced based on their earnings from work after they have reached the pension eligible age. In the case of Japan, pension-eligible workers tend to restrict their earnings by reducing working hours, or sometimes retire completely to receive the full pension to avoid the pension benefit reductions. In the US and the UK, the earnings test has already been eliminated to avoid the possible negative impact on labour supply behaviour of pension-eligible workers. Sweden has revised its pension plan to make it more neutral to labour supply.[4] Lifting the pension age has been used as means to motivate older people to work, but is dependent on appropriate jobs being available. If this is undertaken insensitively it can lead to the casualization and marginalization of the older workforce.

Employment Practices Reforms

In the workplace, age-related employment practices can be a major obstacle to promoting the employment of older people. The typical case is the practice of mandatory retirement. To draw on the Japanese example, mandatory retirement is still a dominant practice; more than 90% of Japanese firms with 30 or more employees currently have mandatory retirement practices (Table 2). In other countries, such as the United States and some members of the European Union, restrictions based on chronological age have either been abolished or made more flexible.

Because mandatory retirement requires severance simply because of age, it impacts in two ways on the use of an older workforce. One is that it reduces the motivation of older people to continue working. As is widely known, mandatory retirement from primary employers does not necessarily mean complete retirement from the workforce. Many older workers go on to secondary job opportunities. However, as is repeatedly confirmed by empirical analysis, mandatory retirement is also a major determinant of complete retirement from the labour market.

In the case of Japan, researchers (Table 2) have estimated the labour supply functions of older people and found that the experience of mandatory retirement significantly reduces the labour force participation possibilities of these people.[1,2] Roughly speaking, mandatory retirement reduces the probability of labour force participation in men aged 60 to 69 in Japan by about 20% if other conditions are constant. According to the Annual Report on the Labour Force Survey (actually a detailed tabulation version of it) of Japan, in which unemployed persons were asked their reasons for not being able to find a new job, the top reason for those over 45 years old has always been age limits. This means that if people have to change their jobs mid-career or after mandatory retirement, it is very difficult for them to find new jobs simply because of their age.

Table 2: The negative effect of mandatory retirement on labour force participation

Research Papers	Observation Year Estimation Sample	Coefficients on the Probability of Labour Force Participation
Seike (1993)	1983 - men aged 60-69	-0.18***
Abe (1998)	1983, 1998, 1992 - men aged 60-69	-0.23***
Seike and Yamada(2004)	2000 - man aged 60-69	-0.18***

*** Statistically significant at the respective level of 1%. For details, see Seike (2008).[5]

The second negative impact of mandatory retirement is that it reduces the use of older workers' potential abilities. Japanese workers subjected to mandatory retirement have a lower possibility of working in a workplace where their abilities are fully used. There are many reasons for this, including obstacles associated with is the setting of age limits by employers when hiring for job openings. Particularly for workers seeking new employment, even before the age of mandatory retirement for those who become unemployed in mid-career, such age limits in hiring seriously constrain their job chances. Older workers may also be offered low status and casualized work and not be offered relevant training opportunities.[6]

The Australian Federal Government has implemented a number of schemes, including the certification of experience, re-training, and an anti-discrimination commissioner in an attempt to address these issues and reduce under-employment.[7] To develop age-diverse workplaces, with a mix of age groups that reflect changing demographic circumstances, it may also be necessary to revisit seniority-based wages and promotion systems. Without having a revision of these, an employer will face increasing numbers of high-wage workers and unnecessary numbers of managers and supervisors.

While a trend toward flattened hierarchies and the stripping out of seniority structures has reduced the numbers of mid-level positions, this may not have addressed the question of seniority and may have even exacerbated problems of career progression. The somewhat paradoxical position, whereby Japan has greater participation than some Western countries, yet mandatory practices, indicates the culturally specific effects of macro policies.

Table 3: Mandatory retirement practice in Japan

	Per cent of companies with mandatory retirement	Age of Mandatory retirement (companies with uniform mandatory retirement age = 100)								
		59 or less	60	61	62	63	64	65	66 and over	(repeated data 65 and over)
1994	90.5	15.9	77.1	2.0	2.0	2.0	2.0	5.0	0.0	-
2004	91.5	0.7	90.5	0.6	0.9	0.9	0.0	6.1	0.4	6.5
2006	95.3	-	90.5	0.5	1.7	1.7	0.0	6.2	0.2	6.3
2007	93.2	-	86.6	0.2	2.5	2.5	0.0	9.0	0.0	9.1
2008	94.4	-	85.2	0.2	1.1	1.1	0.1	10.7	0.1	10.9
2009	91.8	-	82.4	0.3	1.3	1.3	0.2	12.7	0.7	13.5
2010	93.1	-	82.7	0.5	1.1	1.1	0.5	12.3	1.0	13.3

Source: Ministry of Health, Labour and Welfare: up until 2004 the Survey of Employment Management; from 2006 the General Survey on Working Conditions

The Value of Mature-Age Workers

A point that is often overlooked in this debate is that older workers are adding value to their employers. Organizations that recognize this phenomenon benefit in a range ways. For example, contrary to a common employer assumption, job performance does not decline with age.[8]

Further, certain forms of ability such as crystallized intelligence or accumulative knowledge actually increase with age.[9] Such findings indicate that there may be important forms of participation that mature workers can offer, which hinge on a greater understanding of system relationships and psychosocial aspects of working relationships.[10] To the age-specific skills of a mature workforce can be added greater reliability than younger workers. From a productivity perspective, mature workers are less likely to engage in theft from their companies, be absent or quit their jobs.[11],[12] From a diversity perspective, older workers provide a depth of tacit knowledge both to fellow workers as well as to clients and customers.[13]

This capacity to engage in problem solving and critical thinking at work with customers and co-workers also promotes innovation and supportive workplace practices in mature workers. In addition to this relational aspect of their skills, mature workers have diverse social networks and social resources they have accumulated across their lifespans, which organizations can leverage productively.

Gender and Older Workers

There have been three important gender-based changes in labour force participation in industrialized societies. First, there is an increase in women's participation in the workforce. For example, in the United States between 1986 and 2006, there was a 10% increase in working women in the group aged 55 and over working.[14] Second, while there are more women participating in paid employment proportionally, many are working in part-time or more precarious types of work (Figure 1). Third, women are remaining in paid work longer than men.[15]

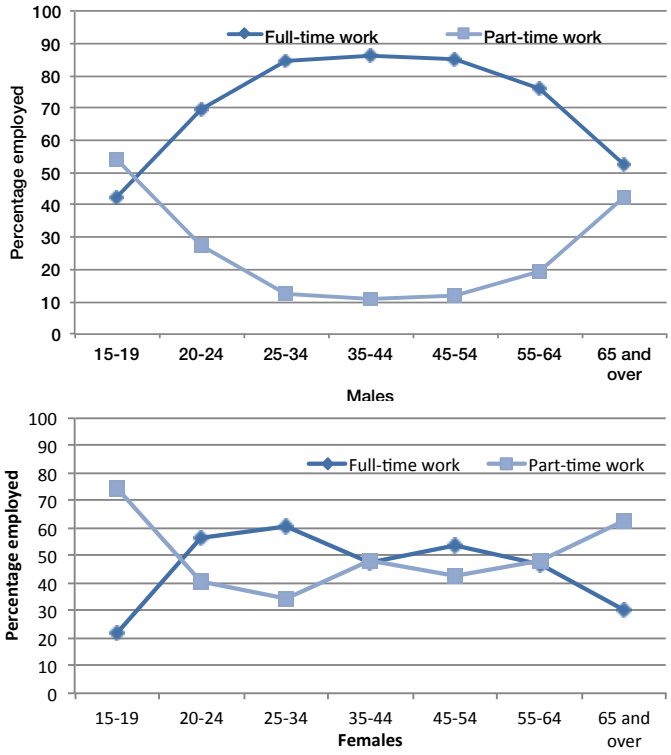
These changes in working patterns have implications for retention and engagement of mature women in the workforce. Historically women have experienced labour market segregation both vertically and horizontally. Even though there is equal pay legislation for women across many nations, the gender wage gap endures and is widest for mature female workers. Mature women can experience discrimination in terms of both age and sex.[16]

Women face workplace challenges such as harassment and spend more time in elder and grandchild care. The movement of women in and out of the paid labour force to participate in childbirth and rearing reduces their access to superannuation (or related plans) across the life course. This means that women have significantly less accumulated financial resources, which has consequences for health and wellbeing.[17]

These challenges are opportunities for organizations. As social institutions, organizations need to be more proactive and inclusive in attracting older workers. They need to provide flexible scheduling, time banks for eldercare, and a better fit between the employee and the job. The lessons of gender-positive work environments – through diversity training where all workers are equally valued and respected – will have wider application as demographic change takes place. Creating an inclusive and equitable organizational culture makes sound business sense. It serves to assist the increasing numbers of women and older workers in general in the paid workforce, and it helps all workers as it widens acknowledgement of the social and motivational value of work flexibility.

A shift toward more service–based industries in developed countries also contributes to the need for such change. According to the Organisation for Economic Co-operation and Development (OECD), the services sector now accounts for over 70% of total employment and value added in OECD economies. These countries are less dependent on hard physical labour and can harness the knowledge and skills accrued across the lifespan, and thus they are friendlier toward older workforce employment.

Figure 1: Australia full-time and part-time work, males and females by age, 2006



Source: Census of Population and Housing, Australia online tables. Cat. No. 2068.0 - 2006 Census tables, 2006 Census of Population and Housing, Australia, labour force status by age by sex for time series, count of persons aged 15 years and over, based on place of usual residence.

Organizational Culture: Mezzo- and Micro-Adaptation

As older workers form a larger proportion of a shrinking workforce, businesses that can keep their existing workers – in whom they have often invested in and who hold detailed understanding of systems and practices – and can attract others will have a competitive advantage. An important factor in increasing the motivation and thus the retention of mature workers will be the working environment itself.

Key to maximizing this process is organizational culture, which in this context includes the social environment within businesses, institutions and service agencies, as well as the ways in which any one organization manages the boundaries between itself and its' social environment. Successful adaptation to demographic change would include examining non-linear career pathways, looking at models of work-life balance and patterns of flexible working, adopting strategies that promote lifelong skills development and facilitating an age-diverse work culture. Indeed, research has shown that even if workers have positive abilities and motivation toward work, a poorly adapted workplace culture will discourage recruitment and retention of mature workers.[18]

Flexible Working Practices

One area that illustrates adaptation to a changing demographic occurs at the crossover between the internal culture and the external environment. Looking at work-life balance and patterns of flexible working are important indicators for organizations adapting to the new demographic environment. Factors include: policies designed to create greater choice and flexibility about moves in and out of work, such as career breaks and time-credit systems;[19] enhancing the capacity of older workers through training; improvements to the work environment; lifelong learning; and anti-discrimination policies.[20]

Encouraging flexible working practices for mature aged workers would include the promotion of gradual retirement and preparation for part-time working, securing greater control over transitions after the age of 50, and spreading work more evenly across the life course.[21] Norwegian research indicates that an existing culture of flexibility significantly enhances the ability to capitalize on an age-inclusive approach to organizational culture.[22]

Part of creating an adaptive organizational culture involves striking a balance between continuity and change, both for individual workers and for the environments in which they work. This includes identifying the particular contribution that mature-age workers make and ways to facilitate an age-diverse work culture. For mature-age workers, parenting responsibilities may be largely over, while in a growing number of cases these are replaced by care for elderly relatives. These workers either may be at a high level within an organization, or may have realized that they are unlikely, or do not wish, to get there. Their motivation has, in other words, largely stabilized at certain levels of power and responsibility.[23]

At the same time, work can offer a number of advantages beyond financial reward, such as social engagement, physical and mental health gains. Mature-age adults also bring particular skills to work activity, such as being able to see the bigger picture, the interaction of activities with wider systems and negotiation skills.[24] Achieving balance between workers from different age groups creates an opportunity to get the skill mix right in adapting to a changing jobs market.[25]

Promoting Health and Wellbeing in Mature-Age Workers

Encouraging occupational health and wellbeing is a valuable ongoing effort for organizations. Promotion of health through a range of interventions (primary, secondary and tertiary) is commonplace where health benefits are linked to work employment such as in the United States and some Nordic countries. These include supervised fitness programmes, smoking cessation, nutritional and improved dietary intake, and return to work programmes.[26]

There are calls for organizations to place greater emphasis on interventions and adjustments that adopt a life course perspective in addressing the health, wellbeing and workability of mature workers.[27] This may include work adjustments that account for visual and hearing changes such as improved lighting, larger signage and volume-adjusted communication technologies.[28] Ergonomic assessments may also be important as they relate to heavy lifting. Wellness programmes that account for unique needs of mature women are also important, for example, osteoporosis prevention.

All these interventions have the capacity to create an organizational culture that promotes the retention, engagement and generativity of mature workers. Organizations that initiate these types of health and wellbeing initiatives exemplify an active ageing approach.

Training and Continuing Development

Developing and maintaining skills for jobs and other activities are indispensable requirements for people to be active in their older years. Tertiary-level attainment has risen sharply and is now at 35% for 25- to 34-year-olds, as compared to 20% for 55- to 64-year-olds.[29] So, future generations are much more educated and will also value sustaining their knowledge and learning. It is vital that efforts be made to promote a lifetime of employability and encourage mature workers to continue to have up-to-date skills. Companies may consider ways to incentivize up-skilling or re-skilling in older workers. This also creates new opportunities to develop human-resource development practices that account for their needs as well as recognize prior learning.

Strategies for Retaining and Engaging Mature Workers

Retention & Engagement Strategies	Description
Job design	Design jobs that create a quality person-job fit that accounts for changes across the life course. For example, older workers value autonomy and skill variety. Offer complex and mentally challenging work, which is important for mature workers' satisfaction and wellbeing.
Flexibility	Create policies and practices flexible scheduling to address eldercare, grandchild care, part-time or project working, flexi-place working.
Training and development	Promote the development and training of mature workers to encourage generativity. Implement training that encourages an inclusive work environment that embraces age-diversity. Use language that creates positive images of older workers and fosters interpersonal and intergenerational relationships.
Health and wellbeing promotion	Target health promotion for mature workers; focus on relevant issues in terms of gender and occupational demands such as balance, flexibility and sensory requirements.
Accommodations	Design procedures for accommodation requests in order to proactively manage an age-diverse workforce. These may include lighting, ergonomic, grip rails, and other sensory and lift policy changes.
Relational management	Create systems and practices that maintain social connections with workers such as alumni activities, websites and social media tools.
Age-diverse organizational culture	Implement each of the aforementioned strategies to facilitate an organizational culture that encourages inclusiveness and engagement of older workers.

Conclusion

Organizational adaptation will be a key element in achieving the human resource needs for a world with fewer younger workers and greater numbers of older workers. Where older people continue working, it can create a virtuous circle for public policy, whereby individuals continue to pay taxes while not drawing down on benefits systems. However these policies are often perceived to be politically difficult and resulting in forced work or work-continuation under insecure conditions.

The advantages of actively attracting mature-age workers are quickly becoming apparent to individual enterprises. Polices that emphasize the "carrot" of age-friendly working environments mean they are better placed to both retain and attract mature workers and achieve wider age diversity. This can be done by focusing on mechanisms that proactively engage with an age-diverse workforce from wellbeing promotion, continuous learning and flexible work practices. Such mezzo-level initiatives are often overshadowed by macro attempts to engineer participation by removing incentives not to work, but may be equally if not a more effective cultural adaptation to an ageing society.

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Chapter 10
Ageing Workforces and Competitiveness – A European Perspective

Giles Archibald and Raymond Brood[1]

After World War II, fertility rates increased substantially in Western Europe. This led to concerns about possible future overcapacity in the workforce. Several governments responded by encouraging retirement through social programmes and tax breaks for private pension arrangements. Germany, Ireland, the United Kingdom and the Netherlands enacted legislation to promote retirement. This concern about overcapacity in the workforce lasted about 30 years.

Due to increasing longevity and falling birth rates, this concern has been superseded by the twin fears of future workforce scarcity and the economic burden of retirees. In the late 1980s it became clear that unless the effective retirement age and women's participation increased, the number of people in the labour force would shrink relative to the older population. If there were then five workers for one retiree, some projections showed it would change by 2030 to perhaps two workers for each retiree in the Netherlands, with even worse figures projected for Italy and Germany.

Although the shifting size of the labour and retirement markets was already clear as a potential problem in the 1980s, it was not on the agenda of the political parties or corporations. Perhaps politicians feared the social tensions or political consequences that might result from implementing the required changes. Corporations had no problem recruiting, and pension plans, which might have provided warning signs, had enjoyed a long period of positive equity returns that masked the real cost of past promises.

However, it was not a problem that companies and governments could ignore forever. A change in awareness started in the 1990s and gathered pace in the new millennium. The current thinking is that unless measures are taken to unlock the resources available in healthy older populations, the demographic profile of Western countries is a potential major hindrance to growth.

Consider these two examples. The Dutch Committee on Labour Market Participation (Commissie Bakker) predicted in 2008 that the labour market in the Netherlands would shrink by about 8% by 2040.[1] The German labour force is expected to shrink by almost 16.5% by 2025, predicts market and employment research by the Institute for Labour (IAB), in Düsseldorf, Germany. Retirement ages are rising throughout the Western world, but only slowly and, so far, inadequately to preserve the balance between retirees and actives.

Changing Human Resource Management

The end of the 20th century and the beginning of the 21st century was characterized by a normal business cycle with an adequate labour supply to accommodate each phase of the cycle. Other than possibly highly skilled workers, people were not managed as a scarce resource. This is very different from the way companies approach the capital goods market or potentially scarce raw materials. Companies use hedge techniques to minimize the risk and volatility of these production factors, but in the past they have taken labour – particularly unskilled labour – for granted.

Because of the expected decrease of the working population, more careful management is likely to be required on almost every kind of job, including those requiring both high and low education levels.

Workforce demographics are easy to predict. Yet, strangely enough, corporations on a broad scale have not yet taken them into account. However, this is changing. Our company, Mercer, is one of the largest HR consulting firms. Our case studies, a recent survey (see Box 1) and personal experiences provide evidence that there is increasing interest among companies in planning their workforce for the long term.

Box 1: Changing populations

Mercer has completed a round of interviews of multinationals based in the United States, Europe and Asia Pacific to discover their reactions to demographic changes. The survey confirmed the growing awareness of the problem among large employers, which are considering an array of actions, including:

- More emphasis on employer branding, including alumni networks
- More global sourcing
- Enhanced education and training
- Development opportunities through job rotation, mentoring and buddy programmes
- Flexible work time, locations and rewards
- Work-life balance
- Improved knowledge management
- Better communication, including social media
- Combination of core, flexitime and temporary workers
- Counselling on financial and pension planning

Is Immigration the Solution?

Perhaps one reason companies have ignored the shrinking labour force is that they expect immigration will solve the problem. However, this is likely to be a false hope. Education, language, lifestyle differences and the demands of native countries make immigration only a partial solution at best. An additional, important limiting factor is that Eastern Europe, a recent past supplier of immigrant labour, is itself ageing.[2]

In addition, there is simply the scale of the problem. Based on current demographic projections, Germany would need very substantial net immigration to maintain a stable population. To achieve this, the proportion of the German future workforce that would need to be a product of immigration, either directly or through their descendants, would be 28% by 2030. To maintain a constant proportion of those aged over 65 to those in the 15 to 65 age group, the immigrant percentage of the population would rise to above 80% (See Table 1).[3] It is unlikely that there will be enough young people to immigrate or who want to immigrate.

Table 1: Per cent of post-1995 migrants and their descendants in total population in 2050, by scenario and country or region

Scenario	I	II	III	IV	V
Country or Region	Medium Variant	Medium Variant with zero Migration	Constant total Population	Constant age group 15-64	Constant ratio group 15-64/65 years or older
France	0,9	0,0	2,9	11,6	68,3
Germany	19,8	0,0	28,0	36,1	80,3
Italy	1,2	0,0	29,0	38,7	79,0
Russian Federation	5,8	0,0	22,9	27,6	71,9
United Kingdom	1,9	0,0	5,5	13,6	59,2
United States	16,8	0,0	2,5	7,9	72,7
Europe	4,3	0,0	17,5	25,8	74,4
European Union	6,2	0,0	16,5	25,7	74,7

Source: United Nations. (2000) Replacement Migration: Is It a Solution to Declining and Ageing Populations? United Nations Population Division.

The level of labour shortage awareness varies within the European Union. Awareness is generally driven by the acuteness of the problem. Where unemployment is low, as in Germany and the Netherlands, where rates are 4% to 5%, the problem is quickly gaining prominence.

In the Dutch market, demand could create 600,000 new jobs by 2015. However, based on demographics, the labour market will only grow by 225,000.[4] Some industries, such as healthcare, education and transportation, are already sounding alarm bells.

The economic growth rate In Germany likely will be adversely affected by the country's demographic profile. Low fertility is taking its toll, as indicated by the fact that apprenticeships remain unfilled. German policy-makers try to solve the problem with immigration and increased participation of women. However, as noted, immigration is not likely to be a solution. More female workers can help, but they are unlikely to be the complete solution.

In other countries with high unemployment, particularly among youth, such as France and Spain, the issue is not high on the agenda. On the basis of entitlement, there is still firm opposition against adequately raising the retirement age. The result may be that these countries will lose valuable time to fully address the issue. As a consequence, the impact of the retirement of the baby boom generation will be more abrupt.

Research done by Mercer among their clients indicates most companies currently appear unsure as to how to deal with the issue of an ageing workforce. This presents an opportunity for the resourceful to gain a competitive advantage.

How Should Businesses Respond?

Before examining actions companies can take, it is important to address the prejudices that exist against the elder workforce. Many employers perceive that older workers are more expensive due to higher wages and extra nonfinancial benefits and are less flexible dealing with change. They also perceive that older workers have higher absenteeism. Evidence shows that the frequency of older worker absenteeism is lower, but the duration is longer; the opposite is true with younger workers.

A study from the University of Utrecht by Professor Joop Schippers shows that younger workers are more ready for change, more eager to learn, more capable with modern technology, physically stronger and more creative.[5] However, older workers are more engaged, more loyal, more client-focused and more accurate, and they have better social skills.

Interestingly, it is not proven that the younger population is more attractive to employers than the elder cohort. Recent statistics in the United Kingdom show that employment in the over-50 age group is growing slightly faster than the national average.[6] The question of relative differences in compensation costs remains. However, younger workers on average change jobs over a much shorter period. When the recruitment and training costs are factored in, the difference in compensation costs is likely not large.

If companies can develop a compensation culture that allows for more flexible pay practices, older workers can perhaps be allowed to reduce responsibilities and consequently receive reduced pay levels consistent with their contribution to the company. Additionally, perhaps a company's demographics should reflect its clientele. For instance, with an ageing population, is it logical to have mainly young employees in the retail sector?

A consensus appears to be building among progressive employers that, because of their complementary capabilities, a good mix between older and younger workers lowers the workforce related risks – such as turnover, skills gaps and cultural dislocation with customers -- and has a positive impact on the total productivity. (To see an example, refer to a 2011 study by the University Mannheim on the Mercedes car manufacturer.)[7]

The solution to this demographic challenge probably lies in companies doing more with the people to whom they have access. This could include higher participation of previously retired workers, the partially disabled and women. For the existing workforce, this might include better engagement, better health, less absence, more mobility and flexibility, later retirement, life-long learning and retraining.

Learning and Retraining

It is important to take a closer look at the issues of learning and retraining. Companies should review how they spend their training budgets. Is more of the budget spent on younger people than on older workers? If so, this could be the wrong answer. In an environment where knowledge becomes obsolete so quickly, people become less flexible if their employer stops investing in their human capital. While less flexible younger people may be able to find jobs elsewhere, older workers may be more likely to stay, thus burdening the company with an unproductive cohort.

Another issue relates to support for caregivers. To help to ensure that no unwanted labour market withdrawals occur, companies must address the fact that employees in an ageing environment are likely to be distracted by caring for their parents.

Flexibility in the balance among work, life and caregiving can prevent overstretching employees and appears to be an emerging feature of progressive employment programmes.

Key Questions

To assess the actions that might work best for an organization, companies should ask the following key questions:

Availability: Where and how fast will labour force shortages appear? What is the optimum mix among full-time, part-time and flexitime work? What trends are businesses experiencing?

Ageing: How is the average age of employees shifting? What will the distribution of the workforce's ages look like in the next 8 to 10 years?

Labour productivity: How is workforce productivity developing in relation to labour costs? Is there an increase due to special labour situations – for instance, older workers?

Absenteeism and presenteeism: What will be the expected absenteeism in coming years? Is it worthwhile to invest in healthcare, or should a policy to diminish absenteeism be in place? Is the current labour force engaged, healthy and flexible? Is it as productive as it might be? Can more vigorous health management increase productivity? (Presenteeism refers to employees who attend work, but are not fully productive due to illness.)

Knowledge: How is knowledge anchored in the organization with regard to the outflow of people? How does this influence the capability to stay in business? Is there likely to be an outflow of information when the elder generation of employees retires?

Based on the answers to these questions, a plan might emerge that:

- Accepts more readily employees' wishes for flexible working
- Emphasizes and reinforces the importance of workforce planning in the medium and long term
- Binds people and keeps them engaged
- Takes measures to reduce absenteeism and presenteeism
- Focuses on preventing all aspects of dropping out of the workforce
- Facilitates lifelong learning and training the elder workforce
- Accepts and helps employees with issues such as elder care, partial disability, immigrant families, etc.
- Regularly takes the pulse of the organization to obtain input from employees as to how to address issues related to ageing

Case Studies

Demographic challenges pose a serious threat to corporate growth. By advance planning and immediate action, companies can mitigate the dangers and turn threats into opportunities. Below are two case studies that describe how 3M and Lanxess have begun to address these issues.

3M Europe's Human Capital Planning Model

The Issue – Severely tightening labour market in the coming years. The workforce will age, will retire later and is more generationally diverse. Individual needs can no longer be captured with collective solutions. Because individuals will have to work longer, they need retraining throughout their careers and must accept more rapid changes.

3M's Challenge – How do we maintain and improve the productivity of our workforce when ageing occurs within a tightening labour market? With an average age of 43 to 48, how do we keep everyone productive and willing to change and adapt to the new needs?

Proposed Solutions

Implement a human capital planning model that enables the organization to adapt to the changing needs of the market and environment. This involves:

- Talent development – measuring talent resignation, diversity, talent externally hired vs. internally promoted, etc.
- Internal mobility as a percentage of total populations
- Human capital positions, including strategic, core, requisite and non-core positions
- Costs of outflow and inflow, and effects of implementing lifecycle employment

The focus will be on four key issues:

- Acquisition of top and diverse talent
- Employee engagement and retention
- Strategic workforce planning and productivity
- Talent development and an inclusive growth culture

3M has developed a human capital planning model for Western Europe. The starting point is the business strategy, which enables the company to determine the requisite human capital. The current workforce will be assessed, and the gaps will be identified. This results in a change programme that contains learning and development, recruiting and demand planning, and a sustainable workforce plan.

Lanxess – a Five-Pillar Programme

The Issue –The ageing workforce.

Lanxess' Challenge – How do we maintain a productive workforce as the average age rises?

Proposed Solutions

Flexible work, eldercare, flexible retirement solutions, training and a focus on working conditions.

In Germany, Lanxess has established a five-pillar programme consisting of:

- An additional savings programme. This programme provides incentives for employees to save, including the possibility of converting part of bonus payments and unused vacation into savings. This can be used for several purposes, including flexible retirement, part-time working, sabbaticals, etc.
- A programme of continuous qualification. Lanxess sees the demographic shift as a serious challenge to corporate knowledge management. The company makes training available to all employees, regardless of age. It plans its vocational training – 500 young people under the various programmes by 2014 – according to detailed demographic analysis unit by unit. However, the company stresses that training is the mutual responsibility of employee and employer.
- A review of working conditions. For example, Lanxess is rethinking the shift system to make it easier for the older workers to continue on shift work.
- Health management. This includes such issues as wellness, ensuring a healthy culture and a change in self-awareness
- Work-life balance. In addition to childcare, for which the company supports its own kindergarten in Germany, it also makes eldercare an equally important priority. A company-wide programme allows employees to reduce their hours on advantageous financial terms to care for elderly parents. This programme makes available special loans to employees to pay for eldercare should they choose to stay in their job.

The largest concentration of Lanxess employees is in Germany. However, the company is looking to extend the programme elsewhere in the world.

Conclusion

The message is clear, yet only some companies in a few countries seem to have heard it. Corporations have the opportunity to gain competitive advantage through unlocking the resources available in healthy older populations. Indeed if they fail to do so, the demographic profile of Western countries is likely a major hindrance to future growth

Endnotes

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III. Pursuing Healthy Ageing: What healthy ageing involves

Chapter 11
The Longevity Dividend: Health as an Investment

S. Jay Olshansky, John Beard and Axel Börsch-Supan

The ageing of humanity is accelerating. While a small number of people is known to have lived to extreme old age throughout recorded history, it is only in the modern era that an unprecedented number is approaching old age with regularity.

In the past, the main challenges to human health and longevity were maternal mortality and communicable diseases that struck early in life; both denied access to old age for the vast majority of people. In developed nations today, and among increasingly larger subgroups of the population in less-developed nations, between 80% and 90% of all babies born will survive past age 65.[1] Combined with falling fertility, these trends mean that older people are now a much larger and rapidly growing proportion of populations around the globe. This trend is likely to continue until at least the middle of this century.

Some authors view this radical transformation in our demographics from an overwhelmingly negative perspective,[2,3] where population ageing is often portrayed as a form of apocalyptic demography. In their narrative, older people are perceived and portrayed only as sick and costly members of society – threatening to strain national economies, overwhelm health care systems, and bankrupt public pensions.

Highly Valuable Social and Economic Assets

However, while the demographic changes we are experiencing will almost certainly present challenges, we contend that older people are a highly significant and often underutilized resource to their community and to society as a whole. The key to unlocking this resource is health. Without health, older people (like anyone else in the population) become less financially secure, are less productive and risk losing their independence. With health, there is much less to distinguish older people from younger healthy, active and productive members of society.

Rather than being seen as a societal cost, older people in nations throughout the world are already, in our view, highly valuable social and economic assets. But this significant human resource will not be fully realized unless we invest in new strategic spending designed to foster good health in later life, and new strategic thinking about ageing and the role of older people in society. Indeed, we contend that the economic value of a rapidly growing healthy older population is so great that healthy ageing should be aggressively pursued on its own merits as a societal investment.[4,5]

This investment will bear a healthy return in extended years of employment and reduced outlays for tertiary health care, as well as other social, economic and health dividends to current and future generations. It will also dramatically enhance the quality of life of people reaching older ages.

Humanity – Fully Vested in Life Extension

Investing in health is not a new idea. Humanity made its first large investment in its own health in the 19th century with the advent of concepts of public health that made clean water, sanitation, controlled indoor living and working environments, better nutrition, and infectious disease control – critical elements in our everyday lives.[6] These investments brought forth the first longevity revolution.

In the 20th century, additional investments in health and longevity were made through immunizations, modern medicine, pharmaceuticals and life-extending medical technologies. Thus, the notion of investing in health and longevity is already at the foundation of an enormous and still rapidly growing suite of industries that share one common theme – the preservation and enhancement of life. Psychologically, economically, emotionally and in every other way, humanity is already fully vested in life extension.

However, we now face a new and puzzling challenge. The 30 years of additional life added to the average lifespan in many parts of the world during the 20th century was the reward for past investments in life extension. Now that survival to older ages is a common occurrence, humanity is paying a heavy price for our longer lives – the rise of a persistent array of unwelcome chronic and disabling diseases. Cancer, heart disease, stroke, Alzheimer's disease, arthritis, sensory impairments and a large number of other familiar maladies that are common among older people are, in large measure, a product of the privilege of living long enough to experience them.

It is important to remember that the diseases of old age should most appropriately be thought of as products of success, not failure. Few would challenge that the trade-off of a much longer life has been worth the rising tide of chronic diseases. Moreover, their negative effects on functional performance and the enjoyment of life come late in life, in most countries usually much later than the current retirement age.

Hence, a strategy to fully exploit the secular change in life course health patterns requires action in two dimensions. First, we need to adapt our social and economic institutions to encourage health improvements at younger ages. Second, enough is now known about the etiology and treatment of most chronic diseases that, if identified and dealt with early enough, the maladies of old age could represent, for many, little more than nuisances requiring adaptation in the later stages of an otherwise healthy life.

Older Generations – an Underutilized Resource

The extension of healthy life is a great economic advantage to individuals and populations because the most important economic resource is the human capacity to produce goods and services – some within the family and society without pay, such as help and volunteer work, and most via markets and for pay. Extending the years of healthy life creates additional capacity, part of which can be used to finance higher healthcare and pension costs.

Often, however, we do not utilize these resources as we could. The dramatic improvement in health at younger ages, and the dynamics of the late onset of functional disabilities due to the "new" chronic diseases, are in stark contrast to our static concepts of the life course transitions, which have developed over the past century or so. These still follow a familiar trajectory: birth; growth and development; education; entrance into the labour force for a single lifetime career; marriage and family; grandparenthood and retirement. This linear ordering, and at set times, may have been appropriate at a particular stage of our social evolution, but the dramatic demographic changes now occurring give pause to reconsider the rigidity of this model.

The concept of retirement transition, in particular, has been remarkably stable across time and countries, and appears unrelated to past and current successful efforts at extending life. Even stronger, labour force participation has fallen dramatically after age 55 in most developed countries since the 1970s and only recently has stabilized.[7] The same holds true in most developing countries for the government sector, often the only sector with a formal pension.

It is a great irony of our times that labour force participation at older ages is low in countries and sectors where people are rich and healthy, while those who are poorer and less healthy tend to work in agricultural or informal jobs such as street vendors until very late in life Why is the ability to work so vastly underutilized among the richer and healthier? One rationale often cited, especially by labour unions and to support the idea that older people are an economic burden, is the belief that removing them from the labour force helps to create job openings for the young. This is wrong (the so-called "lump-of-labour fallacy") because it assumes a zero-sum game and ignores the high costs of early retirement that have to be borne by younger workers, making older workers appear to be more expensive and thus less likely to be hired. In fact, countries with a higher labour force participation of older workers have a lower youth unemployment rate.[8]

Another reason for the underutilization of older people is the prejudice that they are less productive than younger people simply because they are older. There is no scientific evidence to support this belief. Rather, modern technology and the dominance of the service industry over manufacturing and agriculture have equalized productivity across age ranges. While speed and dexterity have been shown to decline as a function of age, this is more than compensated for by increases in experience and even-handedness that often occur at the same time.

A third cause, from an employer's point of view, is that it is often cheaper for a business to discard older people than younger ones, due to strong incentives in the pension system.[9]

Finally, one might think that early retirement is a well-deserved choice for more leisure and freedom from an unwanted job. However, the desire for early retirement is less widespread than often thought. Surveys suggest that about one-third of retirees would have preferred to work longer, but were forced to stop either by poor health or employer policies that required leaving a position due exclusively to chronological age. Another one-third had hoped to become involved in a different kind of occupation upon retirement, often volunteer work, but for many such opportunities were hard to find or required more effort than previously expected. A core strategy for reaping dividends associated with the extension of healthy life is the development of policies to foster the active participation of healthy individuals over age 55 in formal work and informal volunteering.

However, while most people up to age 70, or even beyond, in developed countries – and many in developing countries are indeed healthy – less-than-perfect health does prevent some older people from working. Another element in a strategy to claim the longevity dividend is, therefore, improving the health of those 55- to 70-year-olds who are not very healthy. Taking Europe as an example, improving the health of the sickest one-fifth of the population to the level of the second-sickest fifth would raise labour force participation among people aged 50 and older by about 10%.

Life Course Investments in the Health of Older Populations

In high-income countries, 94% of the "burden of disease" results from chronic disease and injury,[10] and, even in low- and middle-income countries, chronic disease and injury are already the major causes of disease burden. These problems are caused by a combination of genetic susceptibility and, importantly, behaviours and exposures acquired throughout the life course. In fact, diseases expressed among older people today are often a product of events that began much earlier in life, including those caused by events over which we have no control (e.g., the physical, social, and economic environments into which we are born), and those that we modulate through lifestyle choices.

Health events influenced by the choices we make represent the low-hanging fruit of public health, because a significant proportion of the current burden of disease can be reduced by delaying or preventing chronic diseases through interventions to promote healthy behaviours, or by the early detection and management of either the disease or its behavioural risk factors. Classic examples include smoking and the rise of adult-onset and childhood-onset overweight and obesity. Policies to discourage the adoption of smoking, such as taxing cigarettes, or to encourage existing smokers to quit, will reduce the subsequent risk of much chronic disease.[11]

Because good health in older age is not achieved in isolation from the rest of the life course, investments now in health at younger and middle ages are therefore likely to yield a healthier and longer-lived older population in the future. Thus, a sound strategy for investing in the health of older people requires both a life course perspective that addresses the immediate needs of people who have already reached older ages, and a strategy designed to promote healthy behaviours earlier in life so that younger cohorts today can be healthier when they reach older ages in the future.[12]

These should include policies that promote healthy behaviours; education throughout the life course; regular screening for risk factors and early treatment to minimize the consequences of chronic disease; the effective management of more advanced disease through tertiary care and rehabilitation; the creation of age-friendly environments that foster both a healthy lifestyle at younger, middle and older ages; and the active participation of older people in society.[13]

A New Way to Invest in Health

There are still many unknowns related to the future course of health and longevity. While it is clear that most nations have extended lives,[14] it is uncertain how much longer this trend can continue.[15] Furthermore, there is mounting evidence that some populations or population subgroups may be on the verge of a decline in life expectancy because of worsening health among recent cohorts approaching retirement ages,[16] while other subgroups could experience life-expectancy increases that extend beyond current official government forecasts.[17] Perhaps more importantly, it is uncertain whether the added years of life that are a recent product of investments in life extension are going to be healthy or unhealthy.[18]

What is complicating the portrait of health and longevity today is the current medical model that approaches chronic degenerative diseases in much the same way communicable diseases were addressed more than a century ago – one-at-a-time,as they arise. The underlying premise of this model is that all diseases are treated as if they are independent of each other[19] – having their own independent origin and etiology. Scientists know this is not true. Many of the behavioural risk factors for chronic disease relate to more than one condition, and even the physiologic mechanisms are not unrelated. Older people, in particular, often suffer from more than one condition at a time. The broad strategies to foster health in old age therefore need to be centered on a new horizontal model that seeks to prevent the root causes of disease and disability, rather than a vertical approach that is targeted to individual disorders.

More ambitiously, it is worth considering that underlying most of what goes wrong with our bodies as we grow older are underlying biological processes of ageing that advance regardless of the diseases that are commonly expressed throughout the life course. Even if deaths from most major killers today are reduced dramatically, the biological processes of ageing march on, unaltered by any progress we make against specific diseases. Of course, this process is not entirely unrelated to chronic disease, because age is the strongest risk factor for almost all of these individual conditions.

This disjointed concept of ageing and disease has evolved into its current form only in the modern era and poses both a dilemma and an opportunity. If society can reduce mortality rates from chronic diseases, we are likely to enjoy moderately longer lives in better health. However, because ageing itself is unaltered by simply reducing the risk of disease, this approach is likely to run out of steam and eventually yield diminishing gains in both health and longevity.

By contrast, the opportunity that is before us arises from knowing that the biological process of ageing is a risk factor for most of what goes wrong with us as we grow older. Slowing down the processes of ageing – even by just a moderate amount – will yield dramatic improvements in health for current and all future generations. Furthermore, evidence from scientists who study the biology of ageing suggests that this is a plausible goal for modern medicine in the near term.[20,21,22] Advances in the scientific knowledge of ageing may thus create new opportunities that allow us, and generations to follow, to live healthier and longer lives than our predecessors. We have reached a historical moment, as scientists learn more about slowing the underlying processes of ageing, to postpone a wide range of fatal and disabling diseases expressed throughout the lifespan. The result, if successful, would be health and economic benefits for current and all future generations.

There have recently been enough important new advances in this area of science that some find it reasonable to conclude that the technical means to slow ageing in people is a plausible goal. For example, research has dispelled the old belief still held by some that ageing is an immutable process that was genetically programmed by evolution.[23] Indeed, because there can be no ageing or death genes that arose under the direct force of evolution,[24,25] interventions designed to slow ageing in people may have fewer genetic barriers to success than might be otherwise expected. At least some of the manipulations that appear to slow ageing in animal models do just this, maintaining excellent physical and cognitive functioning well beyond the usual ages at which illness and disability start to affect most untreated individuals.[26] In fact, interventions that slow ageing have the potential to do what no surgical procedure, behaviour modification or cure for any one major fatal disease can do; namely, extend youthful vigour throughout the lifespan.

Combined, these new approaches to health promotion, disease prevention and ageing itself have been referred to as the pursuit of the "longevity dividend",[27] although the idea of slowing ageing is not new.[28,29,30,31] This notion is complemented by other scientists who have documented the economic benefits associated with rising life expectancy[32,33] and discussed the prospects of success in slowing ageing and the various benefits that would accrue to society as a result.[34,35,36]

Conclusion

Investing in health is equivalent to any other type of investment in human capital – it has the potential to generate substantive health and economic dividends. However, for policy-makers to tap into the vast wealth of current and future generations of older persons, they are first going to have to dispel the myth that older people are only a drain on society. We suggest here that the best way to unlock the huge social and economic resources of an ageing population is to invest in health throughout life, and then to ensure social adaptation that fosters the ongoing contribution of these resources. A full life course perspective is required that understands and appreciates how investments in health at all ages produce health and economic benefits today and for generations to come.

Two types of investments in health are warranted, and we contend that both should be pursued simultaneously. One involves a life course perspective where investment in improved health among older people is achieved by encouraging improvements in behavioural risk factors at all ages and by the early detection and treatment of chronic disease. This investment will ensure that healthy ageing becomes possible for current older generations, as well as for younger generations that will benefit immediately while they are young and then later in life as they grow older.

The second investment is to attack the seeds of biological ageing itself as a way to postpone all of the infirmities of old age simultaneously. The latter approach requires modern medicine to understand and appreciate the weapon that research on ageing represents for its ability to postpone the diseases that accompany old age. Because prolonged, chronic illness is a powerful driver of medical costs, enormous cost savings would also be achieved if mortality and morbidity could be compressed within a shorter duration of time at the end of life.

Extending the duration of physical and mental capacity would permit people to remain in the labour force longer, amass more income and savings, and thereby lessen the effect of shifting demographics on age-based entitlement programmes, with a net benefit to national economies for those now alive and for all future generations.

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Chapter 12
Design and Operation of Health Systems in Wealthy Industrial Countries

Linda P. Fried, Paul Hogan and John W.

If demography is destiny, then our destiny should be proactively shaped for the better by attention to major demographic changes. A major victory of the 20th century has been the lengthening of lives due to public health – especially the prevention of disease – and medical care, coupled with education and poverty alleviation. The health systems of wealthy industrial countries have been at the centre of some of the greatest miracles of human history. They have virtually eliminated or largely defeated some of the most dread diseases ever experienced by humans, such as smallpox and polio. They have solved medical mysteries and have provided treatments that extend life and improve the quality of life for millions.

It is no exaggeration to say that public health and modern medicine must be credited with the most significant contributions to the longevity bonus the world now enjoys. The resulting success of longer lives is happening worldwide, in almost all developed and developing countries.

Longer lives come with altered healthcare and prevention needs. Thus, the health systems of wealthy industrialized countries must change in response to the miracle they have produced. This chapter provides background on the lengthening of people's lives and the associated changes in health needs. It then covers five fundamental areas in which change must come to match these needs. There is sufficient scientific evidence to indicate recommendations for action. The challenge is to set goals and vision and to implement a cross-sectoral plan.

Demographic Destiny

By 2030, 16.5% of the world's population will be 60 and older. This will rise to 22% by 2050. In most developed countries, the proportion of those 60 and older has already arrived at, or exceeds, these levels. Expected longevity at birth in some countries is near or even above 80, and those who reach 65 can expect to live another 15 or more years, on average.

It is well recognized that older adults are significant users of healthcare out of proportion to their numbers in the population. This is because both physiological and social vulnerabilities are greater at oldest ages and because chronic health problems have had time to accrue over a lifetime.[1]

The health status of older adults and medical care use are thus major factors in driving healthcare costs for developed countries. At the same time, it has also been established that the ageing of populations is a major positive factor in the wealth of countries.[2] The economic benefits can be secured if people live their longer lives in better health status.[3] From an economic perspective, healthy ageing is a key to controlling healthcare costs.

We now understand many of the contributors to healthy ageing and health of older people, how they change with age, and how health systems, if matched to this, could both improve health and lower costs. This will require proactive approaches to evolving our health systems to support healthy ageing through provision of age- and stage-appropriate prevention, along with care and/or palliation matched to the goals and needs of the individual. This will require a health workforce educated to accomplish this. We posit that the changes made towards a health system that supports the health of older adults will also be a better health system for people of all ages.

This chapter addresses the health needs and associated directions in which health systems in developed countries must evolve in response to the ageing of society and to optimize health across the full life course. However, the principles are also relevant to less developed countries, which are ageing rapidly due to successes of investments in development and public health. In fact, developing countries will age in the next 40 years to the level that took developed countries 100 years to achieve.[4] They will have the opportunity to move directly to designing health systems that benefit from the learned principles articulated below, assuming availability of resources.

Health Status and Needs of Older Adults Change with Age

Over ages 65-70, about 50% of older adults in the United States have two or more chronic diseases.[5] Some are living with these diseases without compromise; others have symptoms or resulting disability. In general, half have some difficulty with walking, and 10% to 20% need help with tasks of daily life. In addition, the internal changes in the body due to ageing itself lead to decreased resilience and reserves, or frailty; increased vulnerability to stressors such as extremes of heat and cold; and slower recovery from illness.

Frailty and some chronic diseases lead to increased risk for acute illnesses such as influenza and to disability and falling, with resultant fractures and injuries. Further, vulnerabilities and health problems can be exacerbated by social and psychological challenges with ageing: whether one has sufficient money for food, housing, medications, social supports to prevent isolation and community services to help those who are disabled be able to live in the community.

It is anticipated that the growth of the oldest-old population, now the largest growing segment of older adults, will also bring increased personal care needs. Most of these issues affecting health are highly amenable to prevention and/or responsive to medical care; others are humanely addressed by supportive care. Because there is high variability in health status and therefore variability in care needs between different older adults, a health system has to be able to effectively target both prevention and care to address every patient's unique goals and health status.

Optimizing Our Demographic Destiny – Recommendations

Setting Values and Goals

To evolve a system effectively and favourably, we need to build on cutting-edge knowledge of what improves health with ageing; invest in systems that can provide prevention, care and palliation in correct proportions and across an integrated continuum; and offer prevention across the life course so that individuals arrive at older age healthier. The US Institute of Medicine[6] and the World Health Organization Active Ageing policy framework[7] (Table 1) have convened several task forces over the last decade which can inform goals and conditions for systems needed.

The recommended focus is dual: prevention across the life course including old age, and patient-centered care tailored towards the needs and goals of the individual. This implies core values of investing in health promotion for the population broadly and supporting the needs of the individual in a way that optimizes autonomy and is appropriate to health status. With these goals, health-related responsibilities need to be allocated clearly, appropriately and cost-effectively to individuals (e.g., for self care needs, with necessary education to accomplish these), to the health system, communities, government and the private sector. Health is a cross-sectoral responsibility.

Re-engineering the Medical Model

The medical care model of wealthy industrial countries has been challenged by its own success and the resulting costs. The model for most countries was created at the early stages of the antibiotic era, and before either the ageing of the population or the development of our current knowledge as to how to prevent or care for chronic disease. This chapter proposes that:

1. Demographic pressures, cutting-edge medical and personal-care support, and prevention knowledge hold the potential to improve our systems so that they create health for longer lives at affordable costs. This will require major transitions: (i) paying more attention to prevention and public health; and (ii) moving from hospital, acute care and institutuional care to community-based care.
2. Principles for consideration have been set forth by the US Institute of Medicine report: Retooling for an Aging America: Building the Healthcare Workforce.[8] As stated in this report, "the health needs of the older population need to be addressed comprehensively, services need to be provided efficiently, and older persons need to be partners in their own care." The report recommends principles for a health system that would accomplish this. "Effective features of new models with the strongest evidence of success in improving care quality, health-related outcomes, or efficiency are: interdisciplinary team care; care management; chronic disease self-management programmmes; pharmaceutical management; home care (even including non-medical care); preventive home visits; proactive rehabilitation; caregiver education and support; and transitional care." New models of geriatric care offer cost-effective approaches to optimizing health outcomes for older adults.[9] These systems must be supported by geriatrically knowledgeable professionals.[10] They would most effectively be organized within a coordinated continuum of both prevention and care that spans home, community, clinic, hospital and long-term care settings, with integrated communication across these, and transitions from one setting to another carefully managed. Targeting the individual will require matching the model of care needed to the status and goals of the patient. Increasing illness complexity, disability and frailty necessitate increased team-based care.

3. Health systems for older adults that optimize health in ageing must include more than care to respond to the presence of illness. Prevention matters, both for the individual and for communities.[12] Prevention for older adults includes primary, secondary and tertiary prevention of disease or geriatric conditions of falls and frailty – such as through physical activity, nutrition, smoking cessation and injury, pain, depression and polypharmacy prevention; control of disease, such as diabetes, heart disease and blood pressure to prevent worsening and sequellae; and prevention of loss of independence from these conditions. These require both individually targeted and environmental approaches.
   Examples of prevention in communities are the creation of safe places for older adults to walk and to remain active, self-care programmes for groups of older adults with a chronic disease such as diabetes, or supportive programmes for grandparents raising grandchildren or families caring for someone with Alzheimer's Disease. Further, prevention of chronic, or non-communicable, disease needs to be incorporated into both individual care and community-based prevention for infants, children, young and middle-aged, as well as older adults, so that people are living longer lives in greater health.
4. The healthcare needs of the older population are diverse, and addressing those needs will require varying models of care and effective targeting.
5. Community-based personal care should be offered to support independence, autonomy and ability to age "in place", in one's home. Supportive care is needed by as much as 20% of older adults. This needs to be planned for and delivered across a variety of settings: home, community and institution. The changes needed require cross-sectoral planning and will necessitate sustained leadership.

Education of Health Professionals

Health professionals need to be educated in geriatric knowledge about how health needs change with age. They must know how, when and even where to implement appropriate prevention and care for older adults, as well as when a person is at the end of life and palliation is appropriate. They must also know the value of – and how to work in – the systems which support improving health with ageing. There is significant evidence that such geriatrically knowledgeable care contents and systems improve health outcomes and can decrease healthcare costs.[13]

To accomplish this, health systems also need to support geriatrically competent prevention, as well as treatment of chronic diseases and geriatric conditions, as noted above. Nations need to invest in educating all health professionals to be competent in these issues and train an adequate number who are experts in geriatrics.

These medical professionals also need to be well informed regarding the new, innovative senior care options that over the last few decades have made the traditional "home or nursing home?" quandary completely obsolete. For instance, professional, non-medical home care has been in formal existence for less than 20 years, but it is now helping millions of seniors around the world remain in their own homes, where they generally want to be, for as long as possible. Moreover, research indicates that non-medical care can very effectively complement medical care in today's highly evolved senior care continuum.

These approaches would support the recent recommendations of the Rockefeller-sponsored Global Independent Commission on Education of Health Professionals for the 21st Century.[13] This kind of health system, designed for the heterogeneity and vulnerability of older adults, would result in a better health system for all ages.

Health Promotion through New Roles and Meaningful Engagement

While the subset of the population who are ill and/or at the end of life, at whatever age, require supportive medical, community and family care, many older people are not in that situation and, in fact, now have a long period of healthy life ahead of them. This extended period of healthy life, in the 60s, 70s and even 80s, has been called the "third age". This offers an opportunity for productive engagement in ways that are both meaningful to the individual and beneficial to society and – if well designed – could also be key components of promoting health for older adults. Proactive preparation will help us realize this potential.

Defining Sectoral and Cross-sectoral Responsibilities

Transforming health systems to address demographic changes and implement new knowledge will require partnership across sectors, i.e., between government and the corporate sector – first, on shared goals, and second on aligned implementation. The economy in industrialized countries requires control of, and decreases in, healthcare costs. All sectors require a healthier population to be economically productive.[14] At the same time, this is a basic commitment of a government to its people.

Conclusion

Advances in re-engineering our current healthcare systems to become health systems for populations with longer lives should be shared between developed countries and developing countries. This will require developed countries to bear clear responsibility, with systems to communicate and facilitate transfer of best practices in many directions.

Investment in integrated health systems, including prevention and healthcare, that match health needs in an ageing world, should result over the long term in high return on investment for society, and will be required to transform to a positive ageing world. Investments in geriatrically informed health systems and in prevention across the life course are critical to living longer lives and being healthy.

These approaches will result in a decreased burden of disease and a successful compression of morbidity into the latest points in the human lifespan. While not yet experienced broadly, this should decrease healthcare costs and amplify the benefits to society of being an ageing world.

Table 1: Active Ageing: A Policy Framework, World Health Organization

Health
Prevent and reduce the burden of excess disabilities, chronic diseases and premature mortality.
Reduce risk factors associated with major diseases and increase factors that protect health throughout the life course.
Develop a continuum of affordable, accessible, high quality and age-friendly health and social services that address the needs and rights of women and men as they age.
Provide training and education to caregivers.
Participation
Provide education and learning opportunities throughout the life course.
Recognize and enable the active participation of people in economic development activities, formal and informal work and voluntary activities as they age, according to their individual needs, preferences and capacities.
Encourage people to participate fully in family and community life as they grow older.
Security
Ensure the protection, safety and dignity of older people by addressing the social, financial and physical security rights and needs of people as they age.
Reduce inequities in the security rights and needs of older women.

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Chapter 13
Design and Operation of Health Systems in Developing Countries

David E. Bloom, Ajay Mahal and Larry Rosenberg[1]

For decades, health systems in developing countries have faced numerous challenges – from populations with both communicable and non-communicable diseases (NCDs) to inadequate resources and political environments that sometimes impede effective responses to almost any problem. Now, another challenge is emerging. Developing country populations are ageing at an accelerating pace – one that is much quicker relative to income than has occurred for today's rich countries.

It has become common to point out that developing countries are "getting old before they get rich". In 1980, as Table 1 shows, only 16% of countries in the second poorest quartile had at least 7% of their population aged 60 or over, compared with 81% at the wealthy end of the spectrum. But by 2010, the figure had risen to 50% for the second poorest quartile and to 87% (from 50% in 1980) for those in quartile 3.

Table 1: Developing countries are ageing faster than today's industrial countries did

Quartile[1]	Fraction of countries with 60+ share >7% in 1980	With countries assigned to the 1980 quartile into which they would fall based on their 2010 income: fraction with 60+ share >7% in 2010[2]
Q1 (poorest)	.03	.06
Q2	.16	.50
Q3	.50	.87
Q4 (richest)	.81	.95

Source: Country income levels from World Bank, World Development Indicators, 2011; age data from UN, World Population Prospects: The 2010 Revision.

[1] Measured in terms of GDP/capita, expressed in terms of purchasing power parity.

[2] Based on a re-categorization of countries using their 2010 income (with all incomes, in both years, expressed in constant 2005 international dollars).

Pressure on Health Systems

The fact that populations, including those at low-income levels, are older than before erects major hurdles for healthcare systems for two reasons. First, older people have a higher proportion of NCDs (as compared with infectious diseases) than younger people. This means that health systems will need to be reoriented toward treating NCDs, including the "big four" that were the focus of the United Nations High Level Summit in September 2011: cardiovascular disease, chronic pulmonary disease, diabetes and cancer. These diseases typically require many years of treatment and care, often until death. Moreover, it is common for older people to have more than one chronic disease at a time.

Second, NCDs are relatively costly to treat, resulting in upward pressure on health system expenditures. A recent report[2] estimates that the total cost (i.e., the output loss) of the "big four" NCDs over the next 20 years in low- and middle-income countries will be roughly US$ 14 trillion. By comparison, GDP for these countries in 2010 was US$ 20 trillion.[3] How about overall healthcare outlays? World Bank data for 2009 indicate that total health spending per capita for 129 low- and middle-income countries averaged US$ 365 – with average public spending per capita on health about 55% of that figure (US$ 202). Among these countries, total health spending and public spending on health both increase on a per capita basis with the share of the population aged 60 and over (holding constant 2009 income per capita). If these relationships hold in the years ahead, the UN Population Division's 2050 projections of population shares for those aged 60 and over would translate into a 27% increase in average total health spending per capita for these countries, and a 29% increase in average public spending on health per capita.[4]

All of these challenges are magnified by changes in the context in which population ageing is taking place, some of which have both upsides and downsides for health systems.

- Population is increasing. Even without a rise in the older population's share, a rise in the population's absolute size will be accompanied by a corresponding increase in the absolute number of older people.
- Income per capita is rising in most countries. This is a plus, in that a higher standard of living should mean more resources to tackle problems. But it also may mean rising levels of overweight and obese populations, due to higher consumption of unhealthy (high fat/high calorie) food.
- In many countries, the labour force is gradually shifting from agriculture and manufacturing to services, in which sedentary jobs comprise a higher share.
- People in nearly all countries are continuing to move to cities. This is a trend that tends to be associated with less space for recreation and exercise, but could also mean economies of scale in elder care.
- Many low- and middle-income regions are experiencing a brain drain of younger skilled individuals, associated importantly with international out-migration and the in-migration of medical personnel to urban areas. This exacerbation of gaps in the health workforce undermines the ability of poorer countries and regions within them to meet the needs of their older populations.
- Technological change, driven by improvements in diagnostics and treatments in the industrial countries, is making some aspects of healthcare ever more expensive through demands for similar interventions from an increasingly better-informed population in developing countries. But technological innovation, such as support for health workers through mobile phones, also offers exciting opportunities for innovative approaches to healthcare delivery in low- and middle-income countries.
- Healthcare programmes compete with numerous other pressing priorities (such as education, infrastructure, security and administration) as governments seek to create a sustainable environment for development.
- In many developing countries, longstanding assumptions about families taking care of older people, including healthcare expenses, are breaking down as young people move to cities, more women enter the labour force, couples have fewer children and intergenerational spacing becomes greater. Absent adequate health insurance, the burden of financing healthcare for older people will increasingly shift to public institutions.

Against this backdrop, in which the challenges are very much in flux, what should policy-makers do? We see two possible routes: passive acceptance/business-as-usual scenarios or active, innovative responses.

Business-as-Usual Health System Scenario

The stepped-up budget and demand pressures from population ageing will be difficult to respond to. In fact, many countries will not have the resources to adapt, improve, or expand their healthcare systems, especially if they have only been able to establish minimal-level services without effective integration. What might a business-as-usual scenario look like?

Inadequate Healthcare Supply

Increasing numbers of older people will lead to a rising demand for healthcare, and the increasing complexity and chronicity of the conditions they have will require more expensive interventions. Individuals with advanced chronic disease who experience a diminution of physical and cognitive capacity for self-care, and for whom there is no one else to care, will put pressure on hospital beds. Dementia, in particular, whose incidence increases with age, will become more prevalent in the community, with associated demand for long-term care from family and health/social systems.

Out-of-Date Healthcare Systems

As economies continue to develop in parallel with population ageing, NCDs will become more common, while the prevalence of infectious diseases, maternal and perinatal conditions, and nutritional deficiencies will decrease. Health systems that have been designed to address the latter will need to be re-engineered to respond to more chronic challenges, with more demand for rehabilitation, longer-term follow-up, and long-term care. In addition, because some NCDs potentiate others, healthcare providers will increasingly have to deal with co-morbid NCDs. For example, diabetes often leads to cardiovascular disease or kidney failure, and mental illness can increase the risk of diabetes and possibly cardiovascular disease.

Insufficient Human Resources for Health

As people live longer and suffer from conditions that require ongoing care, more health workers will be needed at the same time that the proportion of the population of traditional working age falls. Health workers will still, of course, be needed to provide acute care, but because so many will be needed to deal with NCDs (including multiple co-morbid NCDs), their training will have to be modified accordingly. This is a difficult shift, as the experiences of more developed, already aged societies have proven, because it requires a societal capacity to look ahead, which is particularly tough in resource-constrained environments.

Greater Inequalities

Technology will become ever more important for care delivery. But because it is most often created in developed countries where cost, although important, is not as central a consideration as in developing countries, its adoption may promote further health inequities between and within countries. In a large number of countries where healthcare is at least partially offered on a fee-for-service basis, those who cannot pay will not benefit from new health technologies, while those who can will tend to live longer and healthier lives.

Active, Innovative Response Scenario

But these bleak outcomes need not occur. A more proactive stance will allow countries to better respond to the new demands that population ageing and associated circumstances will place on their health systems. Moreover, because ageing will be occurring in many instances alongside socioeconomic development, a number of opportunities can arise that allow countries to build more effective systems in an affordable and coherent manner. What would an active, innovative response scenario entail?

Creating Systemic Building Blocks

A series of systemic building blocks should be identified that might be put in place at different levels of economic development to ensure a continuum of coordinated and quality care, once a certain level of wealth is achieved. In the early stages of development, key blocks would include:

- Providing a basic level of primary care with a focus on chronic disease prevention (such as anti-hypertensive therapy)
- Addressing the basic care needs of those with advanced chronic disease and providing basic palliative care to ensure that people die with dignity
- Offering universal access to these services for older age groups, such as those over age 70

As economies strengthen, universal access might be extended to younger ages. At the same time, more complex services might be introduced, with an emphasis on integrating them with the more basic primary care that would already be in place, thereby serving as a natural conduit to secondary, and ultimately, tertiary, services.

Emphasizing Prevention and Non-Communicable Diseases

Primary prevention efforts must include measures aimed at reducing the incidence of NCDs, even though in many countries, infectious diseases and maternal and perinatal conditions still afflict substantial segments of the population. Secondary prevention efforts – early detection of diseases, treatment to impede their further development and complications, and public education to facilitate such prevention – can be more costly, but failure to carry them out can be even more expensive in the long run. A key aspect of prevention is screening, but it must be implemented carefully, given that for many diseases, targeted screening is more cost-effective than mass screening. In older segments of the population, however, the cost/benefit ratios are often different than in younger segments, so the efficacy of screening needs to be evaluated in age-specific ways.

Reforming Healthcare Worker Training

This will include a concentrated effort to refocus healthcare workers' training on NCD prevention, early detection, treatment and care. In addition, given that ageing is a lifelong process, and prevention at early ages tends to lead to healthier lives in later years, a life-course perspective is paramount, which also requires a shift in the way health professionals are trained.

Encouraging Rural Healthcare Workers

Countries that successfully encourage healthcare workers to settle in rural areas and that take measures to combat the departure of healthcare workers from those areas (or from the country entirely) will clearly benefit. In some countries, older people would benefit disproportionately, as the movement of young people from rural areas to cities has left the countryside with older people whose treatment and care needs are not being met. One approach that may be useful is instituting scholarships for healthcare training that are conditional on a period of post-training service (either in-country or in rural areas).[5]

Focusing on Technology

There is an urgent need to develop or adapt technological innovations appropriate for low- and middle-income countries. This applies equally to prevention, screening, diagnosis, treatment and care. Especially promising are the use of computers in keeping patient records and the use of mobile devices in accessing those records and in conveying data on patient health to skilled practitioners who can then provide medical advice in real time.

Targeting the Poor

Institutional innovations matter greatly if they can meet the challenge of scaling up from demonstration projects to much broader populations. In India, the Aravind Eye Care Hospital, a for-profit institution, has treated more than 2 million patients in the past two years. Its doctors have performed surgery on more than 300,000 poor Indians, an achievement made possible by cross-subsidies from richer patients. Similar innovations are taking place elsewhere in India, in the Apollo Hospitals and Narayana Hrudayalaya Hospitals.

The Einstein Hospital in São Paulo, Brazil, which supports a foundation that provides excellent care to hundreds of thousands of poor people, is regarded as one of the city's best private hospitals. Not surprisingly, these efforts are inspiring similar activities in other developing countries.

But ultimately, cross-subsidies cannot resolve health inequalities when they are so large. In any case, even though they do not focus on improving healthcare for older people, such innovations clearly have the potential to benefit that segment of the population.

Establishing Social Health Insurance Programmes

Such programmes would help large numbers of people obtain the advantages of risk pooling, but there will be many design issues to address (such as coverage levels, contributions and co-payments), along with a plethora of implementation challenges. For countries that can take larger political and economic steps, universal coverage with high-quality care can be the goal. Short of that, a country that can commit to providing healthcare for its older population will have made a start in moving toward universal coverage.[6]

However, the provision of insurance should not be confused with creating a health system. Provider-driven care does not necessarily lead to an integrated continuum of care, and systems that rely on fee-for-service payments need to be carefully managed to ensure that incentives for practice operate to the advantage of patients rather than providers.

Instituting a Later Retirement Age

This can, in principle, ease pressure on health budgets, but only in situations where workers are contributing in an ongoing and substantial way to paying national healthcare costs. However, this situation is rather uncommon at present in most developing countries. In addition, encouraging people to work until later ages may help improve their health and postpone or reduce the incidence of health problems because of the effect of greater engagement in social and work arenas. One caution here is that raising the retirement age tends to be more applicable to those not doing manual labour.

Developing the Primary Healthcare (PHC) Sector

These facilities will continue to be the cornerstone of health systems for rapidly ageing developing countries. Care needs to be provided at the community level if costly institutional and highly specialized care is to be avoided. The epidemiological shift from acute to chronic diseases has already occurred in many countries, and in others it is fast taking place. Yet acute care is the norm. Building on research conducted in 12 countries, the World Health Organization has developed, piloted, and evaluated a toolkit based on age-friendly PHC facilities.[7] It offers a model that can be adapted by any country willing to implement PHC facilities oriented to the needs of their ageing populations.

Conclusion

There is no time to dither. With population ageing proceeding apace in virtually every country – and developing countries ageing much more rapidly than is widely realized – time is short for policy-makers to act in a forward-thinking manner. They will need to take into account the fact that low- and middle-income countries are getting older before they accumulate the resources needed to comfortably support an ageing population.

In addition, they will need to prepare for the upcoming surge in NCDs, which will pose extra difficulties for health systems that are already unable to adequately serve large segments of a country's population. And they would do well to consider active, innovative, systemic measures that take advantage of new technologies and lessons learned from the experiences of their more developed counterparts.

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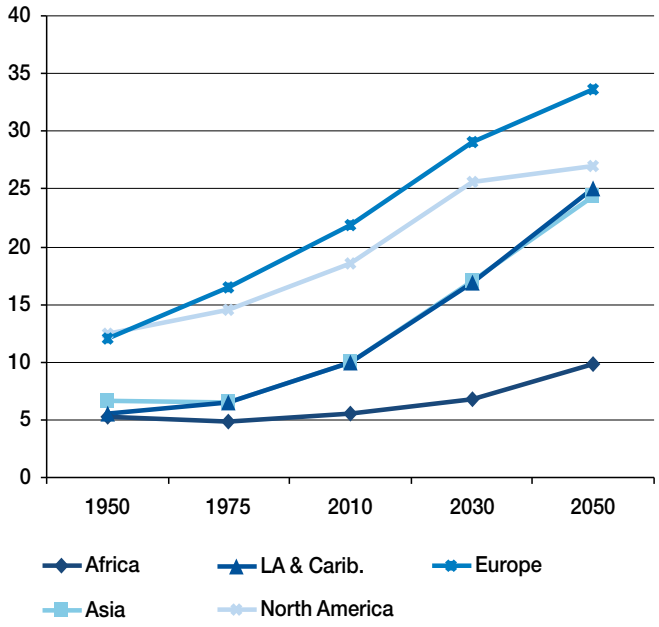
Chapter 14
Ageing Africa: Opportunities for Development

Isabella Aboderin

In contrast to all other parts of the globe, issues of ageing thus far attract little, if any, attention in public and policy discourses in Africa. A major reason for this is the radically different demographic context within which the ageing of populations and individuals on the continent is unfolding. Driven by persisting, often alarmingly high fertility rates, such as up to seven children per woman in Niger, Africa's total population will continue to grow rapidly between now and the end of the century: more than three-fold from about 1.1 billion today to 3.6 billion by 2100, accounting for 80% of the world's additional people by the turn of the century.[1]

Africa will remain the youngest world region, characterized by a vast population of children and youth. The median age on the continent is currently only 19.7 years and will rise to just 26.4 years by 2050, compared to around 40 or more in all other regions. Similarly, the population share of older persons (aged 60 years and above) in Africa, presently only 5.5%, is projected to rise to only 9.8% by 2050, compared to increases from around 10% to 25% in Asia and Latin America, and 20% to 30% in Europe and North America, (Figure 1).[2] Africa's population as a whole will not reach maturity within the horizon of current projections. The contrast to other regions will be even starker if the assumed declines in fertility on which the projections rest does not materialize, and there are signs that they might not.[3]

Figure 1: Population share (%) of older persons, 1950 to 2050 – Africa and other world regions



Source: United Nations Population Division (2011) World Population Prospects. The 2010 Revision

Few Responses to Ageing

Given this demographic constellation, Africa's primary focus is on building the capacity of, and providing opportunities for, its large population of youth. This is part of efforts to foster peace, stability and growth and harness a potential demographic dividend (African Union, 2006; UNECA, 2011a, 2009, 2006; WEF/World Bank/ADB, 2011).[4,5,6,7,8] Issues of older persons, if considered at all, are viewed at best as marginal to, and at worst as a distraction from, core national policy interests and development goals.

As a result, and notwithstanding progress made by a several countries in the development of social protection schemes for older persons, most African governments have effected few, if any, responses to ageing.[9,10,11] This is despite their formal commitments to such action as signatories to the United Nations Madrid Plan of Action on Ageing[12] and the African Union (AU) Policy Framework and Plan of Action on Ageing.[13]

Yet, ageing is – and must be recognized as – a key issue for the future of Africa's societies, which, if harnessed, carries important opportunities for development on the continent.

At the purely demographic level, the relevance of ageing arises in two respects. First, despite low population proportions, Africa overall will see a massive, 13-fold growth in the absolute size of its older population from 56 million today to 716 million by the end of the century. This is a sharper rise than for any other world region or any younger age group, as illustrated in Table 1.[14]

Within Africa, the number of older persons will increase most rapidly in countries of Eastern, Western and Middle Africa. Northern and Southern Africa, while seeing more modest absolute rises, can expect considerably larger increases in their population share of older people – from around 7% today to 30% by 2100, when they will be roughly comparable to those in other world regions.[15]

Second, contrary to common assumptions, there is considerable longevity within the older population. At the age of 60 Africans can expect, on average, to live an additional 16 years (men) and 18 years (women) – not dramatically less than their peers in other world regions, Table 2.[16]

Table 1: Increase in absolute number (millions) of older persons (aged 60 years and above) – Africa and other major world regions

	2010	2050	2100	% increase
Africa	56	215	716	1179
Asia	414	1,253	1473	255
Latin America & Caribbean	59	188	236	300
North America	64	121	166	159
Europe	161	242	219	36

Source: United Nations Population Division (2011) World Population Prospects. The 2010 Revision.

Table 2: Life expectancy at age 60 (years) – Africa and other world regions

	Men	Women
Africa	15	17
Asia	19	22
Latin America & Caribbean	17	20
North America	20	24
Europe	18	22

Source: United Nations Population Division, 2009. Population Ageing 2009.

Policy Options for Development

An active consideration of and engagement with Africa's older people points to major policy options for achieving salient development goals on four key, but thus far largely unrecognized, levels:

- Exclusion of older persons – policy options for enhancing social justice and equity
- A full-life course perspective on human capital development – policy options for raising productivity
- Older persons' intergenerational roles – policy options for fostering youth engagement and transformation
- Responding to population ageing in mature societies – policy options for employment creation

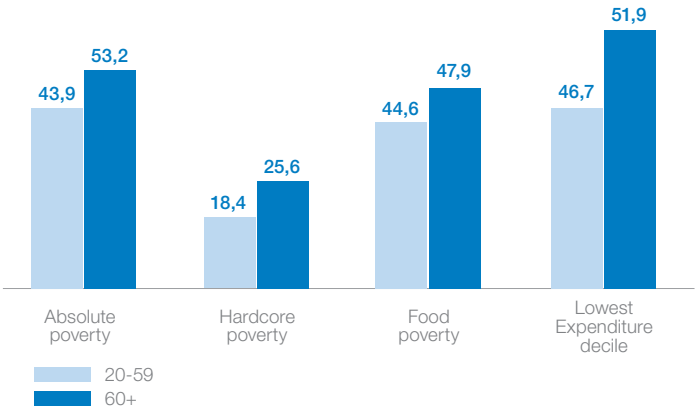
Exclusion – Policy Options for Enhancing Social Justice and Equity

All indications suggest that there is an apparent systematic, aggregate level disadvantage of older persons relative to younger adults in terms of both wealth and health. This is true notwithstanding sharp inequalities within the older population, with privilege concentrated among a few.[17]

Available evidence from various countries suggests a significantly higher incidence of poverty among older persons compared to younger-age adults across rural and urban areas. An example is Kenya, (Figure 2). This underscores a posited link between old age and an elevated risk of deprivation in African settings,[18],[19],[20] which is understood to reflect the combined effects of four factors:

- Diminished physical, mental or cognitive capacity of older persons to engage in sufficiently productive work, coupled with a lack of employment and income-generating opportunities
- Growing inadequacy of customary family-based support systems due to rising resource constraints and attendant resource allocation priorities of younger generations, as well as shifting normative ideas and rural-urban out-migration on their part
- Additional care responsibilities of older persons, most notably for sick children and orphaned grandchildren in contexts of HIV/AIDS
- A broad lack of comprehensive social welfare provision for older people in most Sub-Saharan African countries[21]

Figure 2: Age differences in prevalence of poverty, Kenya



Source: 2005-2006 Kenya Integrated Household Budget Survey

Regarding health, older persons in Africa are consistently shown to suffer significantly more disease and impaired function than younger age groups.[22],[23] A certain amount of excess ill health and disability at older ages is to be expected, of course, as a result of declining functional capacity of the human body from early adulthood to old age.[24]

A considerable share of the excess in Africa, however, is likely unjust in that it reflects a greater exclusion of older persons from healthcare. Evidence shows that older people use health services systematically less than younger-age adults. Particular access difficulties faced by older people include: physical barriers due to large distances to, or long waiting times at, health facilities; financial barriers related to service fees or transport costs; lack of relevant information; and a perceived lack of quality or unavailability of requisite services in the public sector.[25]

In essence, the exclusion of older persons reflects the effects of capacity and resource constraints at the individual level, coupled with a lack of responsiveness to old-age related health needs at the health systems level. The latter arises within a broad health sector context that typically combines acute resource constraints with a priority orientation towards services for younger-aged, Millennium Development Goals (MDGs) related groups – children; mothers; and malaria, tuberculosis and HIV/AIDS sufferers. This leaves little capacity for provision on ageing.[26]

Action to mitigate systematic disadvantages of older persons compared to younger age adults in the areas of health and wealth is urgently needed; and it would mark important progress in the building of equitable and just societies in Africa. Furthermore, the prospect of a secure old age may well foster prudent behaviours and investments among those in young and middle adulthood.[27] Several health and social sector policy approaches are required to this end.

Policies for Inclusive, Effective Health Services

Policy approaches are needed to address major "supply-side" access barriers by enhancing the availability and acceptability of essential services for old-age related health needs, as well as their physical accessibility and affordability.[28] Free healthcare policies such as Senegal's Plan Sesame may serve as potential models for ensuring the latter provided that effectiveness is established through rigorous impact evaluation.

Responses to enhance service availability and acceptability must focus on:

- A broad expansion of appropriate training to develop basic gerontological and geriatric capacity especially among frontline health staff
- Ensuring stocks of essential medicines or other materials for the prevention, diagnosis or management of key health conditions affecting older persons – in particular cardiovascular and musculoskeletal conditions, impaired vision, diabetes, depression and dementia, and consequent functional disability
- Effective outreach and long term care mechanisms, where appropriate, through tele-care technology.[29]

North-South and South-South exchange mechanisms to learn from, or draw on existing gerontological and geriatrics expertise and skills, including among the African diaspora and in the few African countries, such as South Africa, Senegal or Tunisia, that have made progress in old age care, should form a starting point for the development of such responses.[30],[31] More broadly, efforts to reorient African health systems to ageing can and should harness the framework and momentum provided by the new, UN-led global agenda on non-communicable diseases (NCDs) (UN, 2011).[32]

However, this will require active conceptual work to expand the scope of the agenda, which in its present form omits ageing-related issues on three key levels:

- First, an explicit recognition is needed of the particular healthcare access barriers faced by older persons in poor settings.
- Second, a focus is needed beyond the big four killer NCDs (cardiovascular disease, chronic lung disease, cancer and diabetes) on other chronic conditions, such as musculoskeletal conditions, impaired vision or dementia. While not major causes of death, these chronic conditions have immense impacts on the lives and livelihoods of older persons.
- Third, an explicit recognition is required of the pressing need for long-term care responses.

Expand Social Protection

In the social sector, a prime policy option is an expansion, within and across countries, of social pension programmes to enhance the economic capacity and security of poor older persons. The current AU-led agenda and momentum for expansion of social protection in Africa[33],[34] provides an opportune framework for the development of such responses. Existing social pension schemes, such as in South Africa, Namibia, Botswana or Uganda, may serve as models upon which to build. However, rigorous impact evaluations are needed to indicate their effectiveness. Existing evidence that pension recipients in South Africa share their grants with younger household members and effect real improvements in their education and health can further strengthen the rationale for a rolling-out of social pension programmes.[35]

However, more critical attention must be paid to ensuring that actual benefits in wellbeing accrue for older beneficiaries themselves, and that detrimental impacts on intergenerational dynamics within recipient households are avoided. Such impacts can arise, for instance, in contexts of mass unemployment and lack of social welfare provision for working-age adults, where social pensions can create an unnatural dependency of the middle generation upon the old.[36] Social pensions need to be conceived, therefore, as part of a broader social security architecture that supports and enables independence at all adult ages.

Strengthening Family-Based Support Systems

A second required policy approach is a strengthening of informal, family-based support systems for older persons. Interventions to this end must be individually fashioned to be responsive to societies' normative views and expectations regarding intergenerational family solidarity and old-age support.[37]

One approach required across African countries, however, is an effort to facilitate the transfer of remittances from rural-urban or international migrant younger-generation kin to older parents or relatives left behind. Action specifically on labour migration, financial and monetary regulations as well as on banking technologies is needed to support the potentially powerful role that remittances can play in enhancing older persons' economic wellbeing and security.[38]

A Full Life Course Perspective on Human Capital Development

Policy Options for Raising Productivity

Africa has the potential to realize important yields through a longevity dividend by optimizing the productive capacity of the older population (see Chapter 11). So far, however, this potential has remained virtually unrecognized.

The basic idea of enhancing human capacity as an investment for prosperity is not unknown to Africa. It lies at the heart of the current MDGs-led agenda to expand basic education and maternal health and to address key diseases (tuberculosis, malaria and HIV/AIDS) that primarily affect children and younger adults. Such efforts are geared, ultimately, to engendering a dynamic, productive working-age population as a foundation for realizing a potential demographic dividend.[39],[40]

What is lacking thus far is an extension of "investment in health or education" thinking to the whole life course, including to old age. In line with old-age dependency notions, older persons are, implicitly or explicitly, assumed to be unproductive or marginally productive, thereby rendering input into their physical or cognitive capacity redundant.

However, such assumptions, as well as the use of old-age dependency ratios, are fallacious. Labour statistics for most Sub-Saharan African countries show that large, or even majority, percentages of older adults remain economically active, (Table 3).[41]

Table 3: Prevalence of economic activity in the older population – selected African countries

Country	Age group	Prevalence	Survey
Botswana	60+	59.6%	Labour Force Survey, 2006
Kenya	60-64	86.6%	Population Census, 1999
	65+	72.2%	
Sierra Leone	65+	36.1%	Population Census, 2004
Zambia	55-64	66.4%	Population Census, 2000
	65+	54.1%	
Zimbabwe	60-64	81%	Labour Force Survey, 1999
	65+	66.9%	

Source: International Labour Organization (2011) Labour Statistics Database. Laborsta Internet

The gains to be made through investments in the capability of current cohorts of older adults are arguably greatest in relation to agricultural and horticultural food production. The bulk of such production in Africa comes from smallholder farms, which in many communities are predominated by older farmers – due to the selective rural-urban out-migration or HIV-related morbidity or death of younger age adults. In Kenya, for example, the estimated average age of a farmer is 60 years.[42]

At the same time, older farmers' diminished physical and cognitive capability – due to age-related chronic diseases such as musculoskeletal conditions or impaired vision, malnutrition and illiteracy – can severely impair their capacity to grow, process and market their crops effectively, as well as their access to agricultural support (extension) services. Similarly, their experiential knowledge of agronomic practices, while potentially valuable in some respects, can limit their receptiveness to innovative farming methods.[43],[44]

Policy action to improve the health and education of Africa's rural older population is urgently needed. It has the potential to promote enhanced and sustainable food production, and thus food security, on the continent. Action is also needed to ensure the productive capacity of future cohorts of older persons by addressing early life antecedents of later life chronic disease among today's children and youth. This action must be integrated into core development agendas, including in a revised set of Millennium Development Goals after 2015.[45]

Older Persons' Intergenerational Roles

Policy Options for Fostering Youth Engagement and Transformation

Older persons play key intergenerational roles in African families and communities, including in the care of grandchildren whose parents are unavailable, for example because of labour-related migration or HIV/AIDS. They also control family resources, such as land, required by the working-age generation.

Through their roles and the way they execute them, older persons directly influence younger generations' capability for, and perspectives on, economic engagement. The effects can be highly beneficial, as in the case of older people's contribution to raising a generation of HIV/AIDS-related orphans and vulnerable children.[46] However, older persons' intergenerational impacts may also impede capacity at individual and societal levels.

In rural farming communities, for example, older persons' control of land and inheritance can negatively affect how their adult children engage or plan to engage in agricultural food production and enterprise.[47],[48] Similarly, the nutrition, healthcare and education older persons provide to grandchildren under their care may not be optimal.[49]

An active engagement with older persons to channel and harness their intergenerational roles – to foster their intergenerational intelligence[50] – is needed. It carries a real potential for nurturing youth engagement and transformation in agricultural farm production and possibly in other areas.

Policy options to this end can learn from a few existing community based initiatives, such as the "grandmother approach".[51] Moreover, they can be strengthened by invoking customary African values of "elders" and "responsive ageing", which reserve respect only for older persons who actively advance the lives of the younger generations.[52],[53]

In addition to harnessing intergenerational linkages in rural or other communities, there is a need for creative efforts to foster an "elder" mentality at the societal level among Africa's current leaders, a majority of whom are older persons themselves. Such approaches could draw on already existing schemes such as The Elders (see Chapter 8) and the Panel of Eminent African Personalities. If successful, such initiatives may strengthen younger generations' trust in, and constructive engagement with, national governments and help forge a new social contract.

Engagement with Population Ageing in Mature Societies

Policy Options for Creating Employment

In addition to realizing opportunities associated with its own older population, Africa can gain from responding to implications of ageing in already mature or rapidly maturing societies in Europe, Asia and North America. The extant or looming workforce shortages in such regions imply a potential for employment creation for Africa's large population of youth.

A specific policy focus in this respect should be the production and supply of long-term care workers, for which a considerable and growing deficit already exists.[54] International policy agreements between sending and receiving countries, as well as domestic arrangements, can ensure that no "care drain" ensues and, that "brain gain" – specifically in gerontological care – is promoted.

Conclusion

This chapter has highlighted the critical importance of issues of ageing for Africa, despite and indeed as part of, the continent's primary focus on its large youthful population.

Four areas, in particular, have been outlined, in which an active consideration of the older population points to key policy options for realizing salient development goals of raised agricultural productivity and sustainability as well as equity, employment creation and stability. They represent opportunities that Africa should not miss.

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Chapter 15
Modern Medical Education: Meeting the Demands of an Ageing Population

Daniel Ryan and John Wilden

The world is facing unprecedented increases in the numbers of older people and the proportion they represent in both developed and developing countries. While significant increases in life expectancy are widely predicted by most observers, the prospects for future improvements in healthy life expectancy are less clear. Advances in diagnosing and managing diseases have the potential to extend the period of old age and also to expand morbidity, as increasing numbers of older people live longer with existing conditions or survive to ages when multiple morbidities can arise.

A major public health and medical goal is to create improved health during longer life expectancies. New skills are needed for clinicians to achieve this. An increasing range of new treatments and the requirement to make optimal use of available resources will challenge doctors. This is a global challenge for medicine and medical education, which requires global solutions that address the needs of the developed and developing worlds.

A Continuing Trend in Specialization in Medicine

Classical divisions between medicine and surgery and between physicians and barber surgeons date back to ancient Egypt. However, it was only in the 19th century that individual specialities such as cardiology and neurology became formally established. “Specialisation was necessary for the advancement of medicine”,[1] according to Jean Emmanuel Gilibert (1741-1814), noted French physician and early proponent of the scientific method in paediatric medicine. The rapid expansion of medical knowledge over this crucial period would not have achieved such advances by itself.

There has been an intensification of sub-specialization in recent times. Techniques of interventional cardiology have successively advanced the treatment of blocked coronary arteries initially by balloon angioplasty, followed by bare metal stents and drug-eluting stents to prevent collapse and restenosis of the coronary artery. The next generation of stents will be biodegradable and dissolve as the coronary artery heals.

Minimalist surgical techniques offer reduced rates of perioperative morbidity and faster recovery. The da Vinci robotic system, for example, reduces the likelihood of cancer recurrence and loss of function after prostatectomy, while placing additional demands on the skills and resources of the urologist.[2]

Continuing increases in computing power support rapid further advances in imaging technology, which will lead to earlier diagnosis of disease and place additional demands on the medical education of radiologists. Coronary computed tomography angiography (CCTA) enhances the diagnosis of chest pain and coronary artery disease. CCTA holds the prospect of identifying those at risk, such as diabetics and those suffering from hyperlipidaemias who may benefit from more aggressive forms of treatment. Interventional neuroradiologists can now treat aneurysms in the blood vessels of the brain by inserting small platinum coils through very thin catheters.

The potential for further development and specialization is both evident and astounding. But questions remain about how aligned these potential advances will be with the broader medical needs of older people.

Meeting the Medical Needs of an Ageing Population

Many older people have multiple chronic diseases, such as hypertension, diabetes and heart failure, as well as functional difficulties, such as incontinence and cognitive impairments. Healthcare costs and disease prevalence tend to be more highly concentrated in the final months of life, almost regardless of the age of the individual. Medicare beneficiaries in the United States who have four or more chronic disease conditions received a cumulative US$ 468 billion worth of healthcare in 2008.[3] Regular primary care monitoring and appropriate chronic care could significantly reduce this important fraction of Medicare expenditures.

The increasingly narrowed focus of further medical training may restrict doctors' ability to adopt a multidisciplinary and geriatric knowledge approach to treating older patients. When a patient is receiving treatment from a number of specialists, drugs may be prescribed without due care and attention to current medications. This can lead to problems of drug interactions and of patient compliance through loss of confidence in multiple and conflicting doctors' advice.

Doctors are frequently insufficiently trained to provide complex care for chronic diseases. Interdisciplinary clinical teams would provide more appropriate care. Doctors must address diseases and symptoms independently and assess interactions between medical, social and cognitive factors.

Recent research into models of chronic care has identified key skills that primary physicians need to possess or develop. They include effective communication with other health professionals, leadership of interdisciplinary teams, process improvement through audit, support to caregivers and efficient use of information technology (IT). While one would expect that most physicians would have strengths in most of these areas, the broad nature of some of these categories may mean further development and training will be required.

A New Landscape for Geriatric Medicine

Geriatricians are already masters of these talents, and are ideally suited through their training and practice to act as the fulcrum at the centre of care delivery for older patients. In the words of Fried and Hall, "geriatricians are complexivists, with the cognitive skills to analyse complex health issues and establish priorities consistent with patient goals and knowledge of models of care delivery that match the healthcare needs of patients".[4] This involves not just mediation and coordination of care delivery, but a proactive and closely involved advocacy of the patient's health with responsibility for defining and monitoring care needs.

However, just as ageing populations around the world demand greater investment in patient-focused holistic approaches to healthcare, the numbers of geriatricians has not only failed to keep pace, but has actually declined in some countries. We can still reverse this pattern and use medical education, training and investment to shape a future medical workforce of doctors and nurses to the needs of an elderly population. But this will require a seismic shift in priorities that will take many years to achieve. We must seize the opportunity now before it is too late.

There are geriatric centres of excellence around the world, some supported by philanthropic organizations such as the Reynolds and Hartford Foundations. These organizations and separate initiatives have attempted to encourage those with an interest in geriatrics by shortening the period of required training. This has highlighted the importance of focusing geriatric expertise on patients that would benefit most from such care, particularly those over 85 and those with complex medical problems.[5]

Different strategies are necessary to meet the shortfall in geriatric care over different timescales. A short-term strategy would be to encourage physicians from other specialities to cross-train into geriatric medicine. Doctors should be compensated adequately for the time and effort in developing key skills in complex care and disease prevention in older patients, especially those who are frail, disabled and afflicted by multiple diseases

A medium-term strategy could be centred on the seed potential of a core group of current geriatricians, providing them with the necessary funding and support to enhance their educational and leadership skills. Educational programmes such as the Curriculum for the Hospitalized Ageing Medical Patients and the Health Resources and Services Administration's Geriatric Academic Career Awards provide clear evidence of the capability to create effective clinical educators. In addition to teaching geriatrics to other physicians, these educators could support the training of other physicians to become local geriatric champions.

A key role of these geriatrician educators would be to learn from other specialities. Appropriate resources and time must be made available to ensure the sharing of such information within the geriatric medical community. Innovations in the management of different diseases or insights into the development of clinical guidance could enhance the quality of care and potential healthy life expectancy of patients.

These strategies would require major investment, covering the training of geriatric educators and developing new educational programmes. There are a number of stakeholders who might be expected to contribute, including national and local governments, healthcare providers and insurers, but the needs and benefits would have to be clearly analysed and communicated. This would be further complicated because geriatricians may be less well paid than other physicians for a variety of reasons. This gap would need to be addressed by training grants or other career awards.

Looking further into the future, a strategy of greater exposure to geriatric medicine is required throughout medical school training. Different international organizations, including the International Association of Geriatrics and Gerontology and the World Health Organization (WHO), have advanced core competencies that should be addressed in undergraduate medical training for geriatrics, regardless of the eventual chosen speciality. A conference involving almost half of all US medical schools highlighted the need for competencies in the fields of medication management, self-care, balance disorders, hospital care, cognitive disorders, unusual presentation of disease, healthcare planning and palliative care.[6]

The Teaching Geriatrics in Medical Education Study produced by the WHO Department of Ageing and Life Course brought together student leaders from around the world to share insights and build enthusiasm for the subject of ageing.[7] The study evaluated 36 countries through quantitative and qualitative assessment of geriatric education and the proportion of the population represented by older people. As a result, the study was able to evaluate not only whether geriatric education was taking place, but also the quality of such education.

The assessment was reported using a GERIND index (1-100). Figure 1 illustrates that countries tended to fall into one of three groupings. Group A included, perhaps surprisingly, Spain, Portugal, Austria, Germany and Greece. This group of countries was identified as having comparatively limited geriatric education despite having relatively older populations.

Figure 1 : GERIND Versus Older Population in 2000

A review of geriatric education of medical students concluded that while geriatric education had become more extensive in developed countries in recent years, the majority of older people in the future will be living in less developed countries with little – if any –training in geriatric medicine.[8] Medical students need to understand not only disease prevention and management, but also the underlying physiological basis of ageing.

Training in geriatrics could be provided as a stand-alone, independent module or through acquiring different competencies through existing course structures for particular specialities. Evidence to recommend the latter method is provided by a study at the University of Western Ontario,[9] which suggested that there was poor knowledge retention after one year from a three-hour geriatric educational session. Interactive sessions, as provided by the University of Minnesota,[10] where undergraduates take on the role of an older person with different levels of functional disability, are more engaging, and key messages are likely to be retained longer. However, such programmes need to be careful about presenting overly negative images of the healthcare needs of an older population.

Further options would be a rotation or secondment for a number of weeks at a geriatric department or a senior mentoring programme that links medical students with healthy older persons. Unique elements and experiences are likely to have the greatest impact on future behaviours. A study by the University of Arkansas suggested that experience in a hospice was most effectively integrated into future clinical practice.[11]

Dementia and the Geriatrician's Role

An immediate challenge is to target geriatric clinical resources to those elderly patients with complex medical problems, particularly dementia. The progression from mild cognitive impairment, to difficulties organizing daily living, to personality fragmentation, followed by loss of personal identity, incontinence, unsteadiness, then confinement to bed and finally death is very distressing for patients in the early stages of the disease, as well as for loved ones and caregivers in the later stages.

The multiple causes of dementia are diverse and range over a number of specialities including neurology, neurosurgery, psychiatry, endocrinology and metabolic disorders. An individual patient may have more than one identifiable and treatable cause of dementia. Geriatricians coordinating management of a patient within this complex medical milieu will require regular updating of skills, including secondment to other branches of healthcare within the hospital and community setting.

The medical profession began investigating dementia more rigorously following the advent of non-invasive CT (computerized tomography) scans in 1974. Now the question is whether dementia associated with old age, where no specific cause is found, will share a common genetic basis with other neurodegenerative disorders; or whether a reduction in the number of end capillary arterioles in the brain, identified as "vascular dementia", is the predominant cause, or more likely, a combination of both. Currently gene-wide association studies suggest that five genes related to inflammation and metabolic functions within neurons may be of particular importance.[12]

At the so-called "preclinical stage", amyloid in the brain can be detected by positron emission tomography (PET) scans and by specific markers. Magnetic resonance (MR) imaging can assess the degree of brain atrophy. Whatever the outcome of future intensive research, the combination of geriatric neurology and neurogeriatrics has already shaped a new sub-speciality.

Demands Placed on Doctors in the Future

The challenges posed by geriatric medicine are symptomatic of wider demands on the medical profession in general and will need to be addressed. Further sub-specialization will not necessarily address the problems of information overload that may lessen doctors' abilities to adequately manage complex chronic diseases.

To envision the greater demands on doctors, consider how collective understanding of disease processes may improve in coming years. For example, a more detailed understanding of the genetic and epigenetic pathways in the natural history of different diseases, and an expanding range of biomarkers for use in diagnosis and staging of disease, would improve disease management. However, the sheer volume of information may be overwhelming and reduce individual doctors to following centrally developed guidelines for fear of relying on out-of-date experience.

There is no sign that the pace of technological change is slowing. New technologies, such as nanotechnologies, modification of gene expression and generation and implantation of new organs will be developed and become increasingly affordable. The burning question is whether doctors will be able to evaluate the value of such advances and, if so, can they convince a sceptical public of the attendant advantages.

Medical Technicians and Advocates

Perhaps it is too much to ask of anyone. Perhaps a radical solution is needed that positively embraces a new division within the broader medical profession – not between medicine and surgery, or even between the various different specialities, but between medical technicians and medical advocates.

Medical technicians would be able to pursue a tightly defined specialist area to its logical depth, drawing on different strands of medical and physical sciences. They would exhaustively examine new technologies and computer-assisted analytical techniques with only a limited role in patient interaction. Such an approach might be regarded as contrary to the whole ethos of medicine, but in fact it would open medicine to a wider range of talent and expertise. These medical technicians would advance both curative and preventative medicine and directly attack the overall burden of disease.

In contrast, medical advocates would be generalists in expertise, mindset and application. Advocates would unite and extend the working practices of primary physicians and geriatricians, coordinating and enhancing all contacts with the medical technicians. Advocates would also make decisions over the value of treating any single symptom or disease and help patients understand and accept the options.

Conclusion

The value of gatekeeping in primary care is often discussed to ensure that patients see the appropriate specialist at the right time. This is a two-way process. A key role of medical advocates would be to ensure that technicians only see the appropriate patient at the right time. This would have profound benefits for the confidence of patients, the status of the advocates, and the building of mutual trust among advocates, technicians and patients.

Medicine is a vocation, an art and a highly technical science. All are essential to its continued success in shaping our future longevity. Medicine can offer new students many different paths to follow, but we cannot overstress how the care and treatment of older patients will be central to almost all of these paths. The medical education that students, doctors and nurses receive throughout their careers must help them embrace the challenges of old age and focus on outcomes from the patient's point of view.

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Chapter 16
The Challenge of Non-Communicable Diseases and Geriatric Conditions

Ronald Williams and Randall Krakauer

Advances in public health, medical interventions, improved lifestyles and pharmaceuticals are extending the life expectancy of populations across the globe. This has been good news for individuals and society alike, as many seniors now remain vital, contributing members of their communities well into their later years. The downside is that longevity increases the incidence and prevalence of disabling and sometimes fatal non-communicable diseases, placing a physical and emotional strain on families and a financial strain on national, local and individual healthcare budgets. Is there anything that can be done to enhance the quality of life and simultaneously provide the highest quality care to older adults, while stemming the tide of red ink?

This critical question is confronting many developed countries, notably the United States; thus it is useful to examine the issue through an American prism. To be sure, if we were to see improved diets, healthcare, sanitation and public health services in less developed countries, we would see, or in some cases have seen, a similar increase in life expectancy and a corresponding rise in illness and health costs – but perhaps with fewer resources to address them.

An Historical Perspective

Until the 20th century, average life expectancy worldwide at birth was 30 years.[1] Since the incidence of non-communicable disease increases with age,[2] there was less opportunity for individuals to contract – and die from – now common non-communicable diseases like diabetes or heart disease. Rather, individuals tended to die at relatively young ages from communicable diseases, although maternal mortality was also high prior to the 20th century.

Developments in public health and medicine – better sanitation, safe drinking water and improved maternal care, among others – increased the average life expectancy, particularly in developed countries.[3] In 2006, there were almost 500 million people age 65 and older worldwide. By 2030, that number is expected to climb to 1 billion, or one in eight people.[4] While many seniors will remain healthy and vital, nearly half will have at least one non-communicable condition, making illnesses like heart disease, pulmonary disease, hypertension, stroke, diabetes and malignancies more common causes of death.[5]

Non-communicable diseases are by far the leading cause of mortality in the world, representing 60% of all deaths. The death rate from non-communicable illness is already pronounced in some low and middle-income countries.[6] Greater longevity means that people have both more productive years and more years suffering from non-communicable illness, representing both economic contribution and economic cost.

Drivers of Healthcare Costs for Older Populations

Non-Communicable Illnesses

The management of non-communicable illnesses is responsible for the predominant share of medical costs for older persons. Non-communicable disease care management occurs chiefly in the ambulatory setting, although in-patient treatment accounts for much of the cost.[7]

The frequency and severity of illnesses like diabetes, heart disease or malignancy in the older population is staggering. And often, older individuals have not one but multiple comorbid non-communicable conditions. In fact, in the United States, one in five Medicare recipients currently has five or more non-communicable conditions, accounting for 73% of total Medicare costs.[8] In addition, the prevalence of older adults taking 10 or more medications in any given week has risen to 17% of men and 19% of women – more than double the number 25 years ago.[9]

Non-communicable conditions progress over time at varying and irregular rates. With good care management, these conditions can be slowed considerably, often for decades or an entire lifetime, but they cannot often be stopped. The greatest limiting factor to this inevitable progression is death. With sufficient access to good quality care, any one patient may die of other causes before progressing to advanced illness.

Diabetes is a useful example. Typically, patients first appear with metabolic syndrome or high-risk symptoms or disorders. They progress to diabetes, to diabetes with major organ involvement, and then to advanced illness. At each level, costs increase. A patient with metabolic syndrome has medical costs that are not much greater than the costs for a similar healthy patient of comparable age. When the disease progresses to diabetes, the cost is four times that of a comparable age population. With major organ involvement, and then with advanced illness, the cost can increase dramatically.[10]

The scenario of ageing adults with multiple non-communicable illnesses contributes not only to increased medical utilization but also to challenges in the delivery of care. Impaired mobility, declining functional status, and cognitive deficits frequently exacerbate the ability of clinicians to intervene successfully. The incidence, in particular, of dementia in older populations not only complicates care but increases cost – a figure currently estimated at US$ 604 billion in 2010, or about 1% of the world's GDP.[11]

Advanced and Terminal Illness

Advanced and terminal illnesses are also significant drivers of healthcare costs in older populations. When a non-communicable illness progresses beyond the point where treatment aimed at addressing the underlying pathophysiology yields little benefit, the patient moves into what is termed "advanced illness". At this point, the most appropriate medical approach is usually palliative care – or care designed to provide comfort and support, and to relieve symptoms such as pain and discomfort.

However, much more advanced interventions are often continued despite their limited benefit and high cost. In fact, it is estimated that between 10% and 12% of total US healthcare expenditures are for care at the end of life, much of it in the final 30 days before death, with perhaps most of it representing little or no real potential for medical benefit, comfort or informed patient choice.[12]

"Bending the Curve": The Economic Levers of Healthcare

An unintended consequence of lengthening lifespans is the potential for increasing years of non-communicable illness. There is great variability in the health status and overall health costs across countries. While economies with higher per capita spending tend to have longer life expectancies, this trend is less pronounced in those with the highest levels of spending, notably the United States.[13]

Despite these differences, all countries have an incentive to slow the rate of growth in healthcare spending. To do so, it will be necessary to focus on both sides of the healthcare economy – supply and demand – and to use multiple economic levers on each side of the equation. While there is no single solution that will solve the healthcare cost crisis, we can take steps to mitigate its impact.

Supply-side restraints have included government-sponsored national health plans in most industrialized countries, as well as limitations on the availability of certain elective services. For example, for services such as magnetic resonance imaging (MRI), availability might be based on determined need for such services. This would limit the potential and incentive for unnecessary use of such services. Other approaches used in the United States and elsewhere include capitated payments to providers and price controls of various forms and effectiveness. Generally in the United States, however, supply-side constraints have been limited, and utilization of some medical services such as MRI have been greater, with little evidence of medical benefit.[14]

Demand controls have classically involved co-payments, deductibles and utilization management and, more recently, care management, which shows some cost mitigation promise.[15]

While health insurance plans have had some success controlling unnecessary healthcare utilization with increased member cost sharing, that success generally does not apply to non-communicable conditions because, among other reasons, much of the care is medically appropriate. Studies of commercial health plans have not shown a decrease in preventive care utilization or drug adherence; therefore, these products should not hinder efforts to improve long-term health status through encouragement of early intervention programmes.[16]

At the same time, utilization management – the goal of which is to get patients the right care in the right setting at the right time – has had some impact on lowering cost, but its economic value is limited in terms of driving down overall cost trends.

Focusing on Prevention

Focusing on prevention by intervening at the cause may seem like a viable method to control the cost of non-communicable illness. Certainly, there is considerable agreement that preventive medicine can have a significant impact on public health. However, there are limited cases where prevention has been demonstrated to actually reduce overall costs, including childhood immunization and the use of low-dose aspirin to prevent heart disease.[17]

In many other cases, successful prevention can reduce the cost of care for an individual for a period of time, but convincing evidence that it will reduce lifetime health costs is lacking. Because mortality is inevitable, prevention of non-communicable disease will likely add years of life, delaying death and allowing individuals to continue to generate higher healthcare costs – and at a higher yearly rate. This can be offset to an extent by additional productive years, but such benefits would not normally accrue directly to healthcare.

Prevention has the potential to decrease annual or time-dependent costs. Whether it can reduce lifetime, hence system, costs is less clear. There is evidence that for certain conditions it might do so, but perhaps not for others. Predicting the lifetime benefit of prevention of one risk factor in populations with multiple risk factors is complex.[18]

Non-Communicable and Advanced Illness Management

When it comes to bending the healthcare cost curve, the effective management of non-communicable and advanced illness holds dramatic promise. Appropriately managing non-communicable illness has been demonstrated to improve quality while reducing cost.[19] One pertinent example is a randomized trial of care management for older heart failure patients, which demonstrated a 42% reduction in in-patient care days compared to the prior year.[20]

The effective management of non-communicable illness can result in lower utilization of unnecessary services, as shown by this study, as well as better site of service for care, increased medication compliance, and more timely identification of gaps in care.

Even greater potential for reducing healthcare cost can come from the effective management of advanced illness. In the United States and other countries, we all too frequently pursue aggressive therapy beyond the point where a reasonable chance of favourable outcomes is possible. In fact, care in the last year of life represents 30% of the total cost of Medicare in the United States.[21] In the last month of life, 80% of the care received is in an acute in-patient setting.[22] In many cases, this care is neither medically appropriate nor reasonable, and is not based on informed patient choice. Indeed, when care managers offer the option of supportive or palliative care, over 80% of patients choose it.[23] In the United States and elsewhere, hospice use is increasing, however, it remains well below levels that one might expect based on experience with informed patient choice.

In the United States, Aetna has demonstrated the potential for such efforts with its groundbreaking Compassionate Care programme. The programme removes barriers to needed care and promotes choice and autonomy for patients and their families at the end of life. It provides expanded coverage for hospice and palliative care, respite care for caregivers, bereavement services, enhanced case management and web-based tools and information.

This marriage of palliative and curative care improves overall health, reduces acute care stays and eases the end-of-life experience for patients and families alike. Published results demonstrate the programme's success. Patients enrolled in the Compassionate Care programme incurred 82% fewer acute care days.[24] With acute care representing 80% of the cost of terminal illness and terminal illness representing nearly 30% of the overall cost of Medicare, the opportunity to control costs is significant.[25] Programmes such as this one, focused on the intersection of quality and cost, show tremendous promise for reducing healthcare costs.

Collaborative and Coordinated Care

The continued development of a more collaborative, coordinated and integrated healthcare system can have a significant impact on slowing rising healthcare costs and improving overall quality of life. Important work is being done to coordinate care across the entire healthcare system – from caregivers to clinicians to facilities to health plans. In addition, efforts aimed at shared risk, coordinated care management, longitudinal planning, health information technology and the like are in various stages of maturity across the globe. Continuing to nurture such efforts will help blunt the rising cost of care of our ageing population and will have the added benefit of improving care quality and patient experience.

Collaboration among those who provide care (physicians and facilities) and those who finance it (insurance companies or governments) is a largely untapped opportunity for helping to control costs. While the relationship between these two camps has too often been adversarial, it would be a good idea for each to recognize the value to be gained through co-operation. In particular, there are two fronts on which both groups share common goals: incentives and patient care, which are themselves closely related.

The healthcare system tends to set up perverse incentives that drive unhelpful and often costly behaviour. In a fee-for-service model, providers are paid for each "service" they perform. As a result, providers have an incentive to perform more tests and procedures, sometimes unnecessarily, which drives up the cost of care. As a way to improve patient care and reduce healthcare costs, providers and insurers must agree on a set of incentives that appropriately aligns rewards with effective and efficient patient care. Such incentives should be based on outcomes achieved rather than just processes. To ensure quality, they also should measure care against industry-recognized, evidence-based standards, using appropriate adjustment for the risk level of the populations.

On the patient-care front, we must utilize more effectively the significant care-management expertise of health plans in collaboration with providers. One pertinent example is a collaboration between NOVA-Intermed and Aetna Medicare. By combining committed primary care and case management, acute utilization is 50% lower than that experienced by unmanaged Medicare patients, exclusive of denials.[26] This illustrates what can be accomplished at the intersection of cost and quality when healthcare providers and health plans work together, principally through better care management and availability of actionable data.

Such collaboration to provide for better longitudinal care management has been cited by the World Health Organization (WHO) as an important component of an effective healthcare system.[27] The WHO calls for "primary care coordination hubs", where primary care teams work cooperatively with specialized services, organizations and institutions to improve the health of entire populations. This concept has the potential to "transform care into a network, where relations between the primary care team and the other institutions and services are no longer based only on top-down hierarchy and bottom-up referral, but on cooperation and coordination".[28]

The Future of Healthcare Spending versus GDP

Worldwide, the average health expenditure in 2007 was 8.6% of GDP.[29] In the same year, the United States spent roughly double that figure at 15.7% of total GDP.[30] This spending occurred despite the fact that the proportion of healthcare expenditures funded by public programmes is materially less for the US compared to the worldwide average.[31]

As previously discussed, increasing worldwide life expectancies are driving an increase in the prevalence of non-communicable disease and creating significant upward pressure on healthcare expenses as a percentage of GDP. High healthcare costs, particularly in the US, are driven at least partly by unnecessary services for non-communicable and particularly advanced illness. Nonetheless, an ageing population and the associated multiple non-communicable conditions would be expected to drive increasing health expenditures even if utilization of resources could be optimized.

While we have outlined several areas of focus for stemming the tide of rising healthcare costs – including more effective management of non-communicable and advanced illness and the development of a more integrated and collaborative healthcare system – perhaps the most important first step is to accept the inevitable. Healthcare costs as a percentage of GDP are rising. Some developed nations have already seen this trend, and the rest of the world is on alert. It is a reality that cannot be entirely avoided. That leads to the broader question – what is a reasonable percentage of a nation's GDP to spend on healthcare? Is it 5%? 10%? What should the benchmark be? These are questions that world leaders must wrestle to answer.

Conclusion

Certainly, no one would want to trade the low-cost and relatively ineffective healthcare system of a century ago for today's highly developed medical enterprise. After all, advances in medicine and public health measures have contributed to the rise in life expectancy, yielding along with it significant social, economic and cultural benefits that should not be minimized. Many older adults achieve considerable functional, cognitive and psychological wellbeing into their eighth, ninth and even 10th decades. But society cannot avoid addressing the challenges such longevity brings – namely, more non-communicable and advanced disease, and the attendant increased cost.

As long as populations age and healthcare advances, costs will increase. However, as we have suggested, there are considerable opportunities to exert downward pressure on rising healthcare costs. Chief among these is an integrated and coordinated care approach, where all parts of the system – healthcare providers, payers, patients, institutions and information technology – work more closely together for the benefit of patients. Governments, institutions and the public must press all players in the healthcare system to make this coordinated approach a priority.

When a coordinated care approach is coupled with the effective management of non-communicable and advanced diseases, we can improve both the personal health of individuals and the healthcare budgets of nations. By advocating for additional emphasis on preventing and treating non-communicable illness – and by removing the barriers to end-of-life care – we can help stem the rising tide of costs.

While we work to maintain a sustainable healthcare system by adopting such efforts, we also must acknowledge that there is not a "magic bullet" solution to easily solve the cost problem. Rather, we must re-evaluate our perception of what is currently deemed an acceptable level of spending on healthcare. This may require a shift in public priorities and some painful economic choices.

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IV. Redesigning Our Environment: What a better world might look like

Chapter 17
Social Protection of Older People

David E. Bloom, Emmanuel Jimenez and Larry Rosenberg

Social protection is a major arena of government activity aimed at ensuring that vulnerable population groups receive appropriate and effective public support to safeguard their financial security and their health. However, despite the growth and extent of social protection programmes in both developed and developing countries, most emerging economies have nascent systems, and only a small portion of such efforts addresses the specific vulnerabilities and needs of older people.

The varied situations of older people in countries throughout the world have led to differing definitions of "older people". In addition, gender differences in labour force participation, retirement age and long-term income security mean that the effects of "old age", as well as societal responses to ageing, will be different for men and women. For the sake of simplicity and clarity, this paper considers those aged 60 and above to be "older people".

This paper discusses the vulnerabilities of older people and the benefits of crafting social programmes to address them; describes the nature of social protection and the forms it can take to address those vulnerabilities; reports descriptive evidence on the availability and use of social protection programmes; and delineates steps that can be taken to remedy the shortfalls experienced by older people.

Vulnerabilities of Older People

In all countries, both developed and developing, older people face an array of vulnerabilities. Among these are lack of income, health insecurity and the need for physical care.

It is not possible to say definitively that older people are always poorer relative to other age groups. With an official poverty rate of 35%, they certainly were in the United States in 1960; but less than 40 years later this rate had fallen to 10%, lower than that for the non-elderly.[1] In Eastern Europe and Central Asia, in the years after the transition from socialist economies, older people, relying on built-up assets and generous pensions, were typically better off than other groups.[2] Data from the 1990s from a diverse group of countries with roughly comparable household data sets – Ghana, Pakistan, South Africa and Ukraine – indicated that consumption poverty for older people was higher than the non-elderly, but lower than that of children.[3]

A recent study in Latin America showed that the population over age 60 was not any more likely to be poorer in terms of income than others in 15 of 18 countries; but their poverty status was worse in Colombia, Costa Rica, and Mexico.[4] Similarly, poverty rates among older people in Sri Lanka, India and several countries in North Africa are equal to or lower than those of the general population.[5] What drives these diverse results? Why are older people more secure in terms of well-being in some places and some time periods relative to others?

The answers depend on how older people derive their income and the reliability of the flow. First, older people in nearly all settings are on average less likely to have paid employment than are younger adults. Older people often rely for income on a combination of fixed assets, in many cases meagre savings, government programmes such as pensions, and support from family members. Savings, aside from often being small, can lose value to inflation. Frequently, there are insufficient investment vehicles to counteract savings' loss of value over time.

Pensions can be extremely important, but particularly in developing countries they tend to be small, and coverage is spotty. Even in some developed countries such as the United States, public pension programmes like Social Security may not provide sufficient income for most people during retirement. Family members have traditionally been the prime source of financial support for older people. In many societies, this is still true, although in Japan and many other countries, older people transfer resources to younger generations until they reach their 80s. But in numerous places, the family ties that underlie continued support of older people are beginning to fray. Reasons for this include young people moving away from family homes in rural areas, the greater tendency for women to work outside of the home, the tendency for families to be smaller and for generations to be more spread out. In some instances, cultural changes are diminishing the expectation that children will take charge of caring for their parents.

Older people are also vulnerable because they are more likely to have health issues. In a survey of seven Latin American and Caribbean cities, more than 77% of those aged 60 and over claim to live with a disease and 19% have a disability.[6,7] When they are ill, older people often have inadequate access to medical care. When there is access, they may be unable to pay for the care they require, or the service may be of low quality. Health insurance is available to some, but in developing countries, most older people do not have health insurance.

As a result, older people in many countries lack preventive care, face untreated illnesses, are uncertain about new health problems that they may have to face in the future, and are unable to pay for the amount and quality of healthcare they need. Further, the consequences of chronic disease may limit their capacity to remain independent and support themselves, and when they have a catastrophic condition that requires treatment, they often use up family savings. As a result, spending on healthcare is a prime reason that families with or without older members fall into poverty.

Finally, older people are vulnerable because they need companionship, physical care and assistance. Companionship may be difficult to find as spouses die and children move away or feel less obligation to take care of parents. Reduced mobility may limit their capacity to remain socially engaged outside of the family. The same factors affect physical care and assistance. These trends are especially true in developed countries where older people tend to live alone or with a spouse. Changes can occur rapidly, even in traditional societies. For example, the proportion of older Japanese living with children is estimated now to be about 42%, which is much lower than the 87% in 1960.[8] Thus, older people in developing countries, where they still rely more heavily on family members for care and survival, may be confronting wrenching changes soon. One indicator of this is the difference among countries in the same region. In Latin America, only about 10% to 23% of older people in Central American countries live alone compared to well over 50% in Argentina and Uruguay.[9]

The extent of the vulnerability of older people varies considerably from one population group to another. Those at the higher end of the income spectrum are more secure than the poor. Those in good health, or whose health problems are compressed into a relatively small portion of their lifespan, have less to deal with than those who are chronically ill. Those without children and those who cannot get around by themselves tend to be more vulnerable. Widows often face particularly daunting constraints on their activities, finance and future relationships.[10]

Women are generally more vulnerable than men, in part because they have typically had less opportunity to amass savings because they are less likely to have had paid employment and more likely to have left the labour force earlier. However, their traditional role as carers may benefit their partners. The "oldest old", i.e., those aged 80 and above, tend to have more limited capacities and more complex needs than those between ages 60 and 79. As a result, they are particularly subject to financial and health uncertainties.

Social Protection

The idea of social protection arises because individual and family resources are often insufficient to protect members of society from a broad array of vulnerabilities. These vulnerabilities include those described above in relation to older people but extend to other more specific circumstances, such as unemployment, disability, children whose needs are unmet, and workers who face problematic working conditions. Consideration of social protection also arises from the fact that some of the benefits it conveys accrue collectively. Health insurance, for example, is a benefit to all because it leads to fewer people falling into poverty. Poverty is a condition that has negative spill-overs for society as a whole. Similarly, the good health of individuals, which can be abetted by social protection, has positive effects on a whole society.

International agencies have varying definitions of social protection and focus on different but related goals. Some focus on managing risks and others on the importance of responding to economic shocks or natural disasters. Still others emphasize the importance of ensuring people's rights, including their access to good employment. The Asian Development Bank takes social protection to mean "policies and [programmes] designed to reduce poverty and vulnerability by promoting efficient [labour] markets, diminishing people's exposure to risks, and enhancing their capacity to protect themselves against hazards and interruption/loss of income".[11]

The World Bank is re-evaluating its Social Protection Strategy. The publicly available concept note refers to a three-part articulation of programmes: prevention against drops in well-being through social insurance; protection from destitution and catastrophic losses through social assistance programmes; and promotion of improved opportunities and livelihoods, chiefly through better jobs.[12]

These definitions encompass a broad swath of government programmes. But that is central to the notion of social protection, which does not have as clearly defined boundaries as more established sectors, such as education, transport or health. Addressing risks and vulnerabilities often requires an all-of-government approach that cuts across many sectors.

It is also useful to state what social protection does not include. Social protection refers to public programmes, not private efforts to guard against the many dangers faced by people of all ages. Social protection does not encompass two important means by which older people receive support. First, social protection does not refer to the use of individuals' savings for their support in old age. Second, it does not refer to various types of financial and social support that families often provide. As important as these are, they are not social activities.

In all definitions, social protection aims to diversify risk. Ensuring a certain level of protection for all people means that a society is less likely to have to deal with the consequences of extreme poverty or acute hunger. Because social protection is ultimately funded by governments, it is a social undertaking that bolsters a society's resilience by lessening individuals' vulnerability. It aims to achieve these aims efficiently, but in doing so it also increases equity.

Social protection first achieved prominence when Otto von Bismarck established a welfare programme in Germany to satisfy people's demands in a way that would avoid the possibility of a socialist revolution. Later, the Depression led to the New Deal in the United States. After World War II, the Scandinavian countries moved further towards implementing broad social welfare programmes. In the United Kingdom in 1942, the Beveridge Report led to an expansion of social protection programmes. After the wave of independence from the 1940s through the 1960s, various developing countries began to implement or expand existing social protection programmes.

Numerous rationales have supported and continue to undergird social protection programmes. These rationales support action in the social protection arena independent of the age of programme beneficiaries; they apply to older people as well as to the population as whole. The most fundamental rationale is that we collectively have a moral obligation and a desire to ensure that people have good lives; without question, this applies to older people. In response to privation and insecurity in a very wide range of circumstances, government action to redress these wrongs in the form of social protection resonates with the beliefs of very large numbers of people.

Closely related to this point is the idea that everyone is entitled to a basic set of human rights, a concept that is enshrined in the Universal Declaration of Human Rights adopted by the United Nations in 1948. In part as a response to the Declaration, human rights occupy a prominent position in international law and in the laws of many countries, further spurring the development of social protection programmes. By virtue of the explicit statement that human rights apply to everyone, older people are legally guaranteed an array of rights realization of which can be bolstered by social protection programmes.

Complementing the rights-based rationale is poverty reduction, a principal policy objective for most nations. The most efficient social protection strategy would be to include older people within general social assistance programmes. Horizontal equity would then be preserved. But in cases where older people are over represented among the poor and they are not able to claim their share of these programmes, direct transfers to them through social programmes may be warranted.[13]

Finally, there is growing evidence that the gains achieved by social protection programmes can give an impetus to economic growth. Families that do not have to struggle for every penny, whose members are healthier than in the past, or whose elderly individuals receive pensions or welfare payments, are more able to be economically productive members of society. These families contribute to their own well-being and to that of a country as a whole. The recent Commission on Growth and Development led by Michael Spence concluded that, while there is no one policy recipe for sustained growth, there are some essential ingredients, one of which is to protect people through social safety nets, without which "popular support for a growth strategy will quickly erode".[14]

Social protection involves numerous actors and stakeholders. National governments are the most central participants in social protection programmes, as they have responsibility for the welfare of their citizens. Local governments and non-governmental organizations are often very active in social protection efforts. International organizations sometimes play a major role. Finally, the for-profit private sector can participate in certain aspects of social protection, for example in the delivery of services. The most obvious stakeholders are the people that social protection seeks to protect: the poor and the vulnerable. Among these, older people figure prominently in some aspects of social protection, most notably, pensions.

Achievements and Gaps

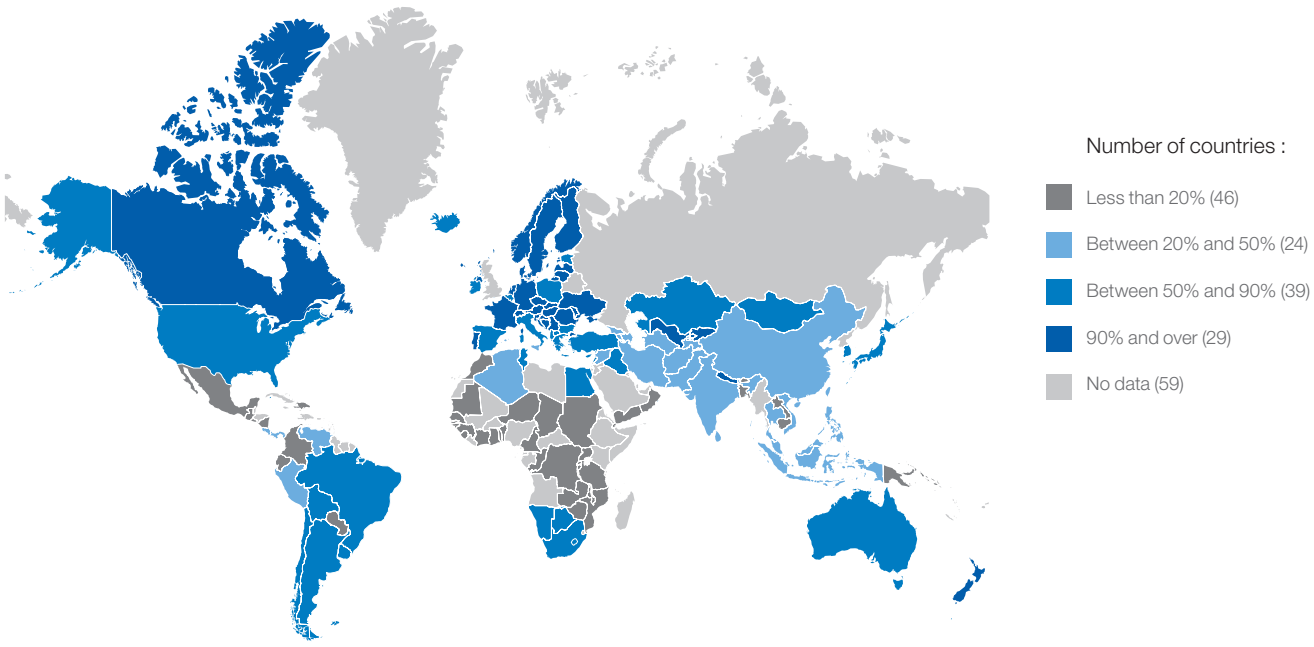
Social protection programmes of various types are in place in countries throughout the world. But as applied to older people, the most significant programmes are limited to pensions and health insurance, along with a variety of other payments. Unfortunately, there is no fully developed and internally consistent source of data about the reach of social protection programmes, and other than pensions, even less so about those that apply specifically to older people. Various international agencies have assembled partial data sets, with information based on both a review of government efforts and survey data, but these sources are not adequate to provide an overall picture.

Pensions

Pensions may be supplied by either the private sector or the public sector, but only government-provided pensions fall under the rubric of social protection. Most governments in countries that are in the greatest need of social protection have little in the way of pension programmes, but South Africa and Ghana are notable exceptions in their determination to provide income security to older people. The case of South Africa is particularly interesting, because the large pensions received by older people also have substantial positive effects on other household members.[15] One measure of the significance of a country's pension system is the extent of its coverage or the share of older people that receive a pension at all. Another measure is the fraction of a worker's income that is replaced by a pension.

Pension coverage for older people via state-run social protection programmes varies greatly across countries. Figure 1 shows that coverage is greater than 50% for most developed countries and some developing countries, and below or far below that percentage for many developing countries. Among Organisation for Economic Development and Co-operation (OECD) countries, for example, over 83% of the labour force is covered by mandatory pensions schemes. This contrasts with about 21% in China.[16]

Figure 1: Share of elderly who receive a pension via public programmes



Source: International Labour Office (2010). World Social Security Report 2010/11: Providing coverage in times of crisis and beyond. Geneva: ILO, 47.

Pension financing typically takes one of two forms. In a pay-as-you-go (PAYG) system, benefits to retired individuals are financed by contributions from current workers or employers and by any savings such a system has accumulated from past contributions. The size of the benefits is typically predefined. The US Social Security System is an example of a PAYG system in which both workers and employers make mandatory contributions. In such a system, the availability of funds to pay retirement benefits to workers depends on a variety of factors, including prominently the long-term ability of the economy to generate enough employment so that accumulated contributions are sufficient.

By contrast, a fully funded system typically functions via workers making defined contributions to individual accounts, which are invested in financial assets of various types. The ability of such a system to fund individuals' retirement depends on the level of a person's contributions, but also heavily on the performance of the financial sector over a period of decades. As an element of a social protection programme, a government can seek to implement either type of system. In particular, low-income countries can face difficulties in making either type work.

Latin American countries have an array of pension systems. Among those with publicly operated plans, coverage of employed individuals ranges from 52% in Brazil to 14% in Paraguay. In some Latin American countries (Argentina, Brazil, Chile and Uruguay), older people are less likely to be poor than the population as a whole, whereas the reverse holds in Bolivia, Colombia, Costa Rica, Honduras and Mexico.[17]

India has both defined-benefit and defined-contribution pension systems, both publicly managed, either by states or the national government. However, their reach is limited. Most workers in the formal sector (i.e., those employed by government or in registered businesses – about 10% of the workforce) are required to contribute to one or more of an array of pension programmes, one of which includes matching contributions from the government. The various programmes yield benefits of differing types – lump-sum payouts, annuities or a set of defined-benefit payments – though some plans of this latter type are at risk of insolvency. In 2009, the Indian government made one of its pension plans open to all Indian citizens, although there are no matching contributions.[18]

Retirement policy is relevant to the establishment and functioning of pension systems. While individuals continue to work and thereby support themselves, they can contribute to a pension fund. Once they stop working, they typically begin to draw funds from a pension system, if one is operational. In countries where people retire at a relatively early age, the funds available for pensions will, all things equal, be less than in countries where retirement usually occurs later. As a result, retirement systems that encourage an early end to labour force participation result in a lower level of funding for pension systems. Many workers want to retire as early as possible to enjoy the benefits that retirement can bring.

But the fruits of retirement depend crucially, though far from exclusively, on parameters of the pension system. Some focus the debate on adequacy of the replacement rate, which is the pension relative to the previous earnings level. This varies enormously across countries – an average of 60% for men in OECD countries to just above 13% in Singapore.[19] However, because pensions are taxed differently across countries, the replacement rate may not reflect whether the retired are well off. In addition, the financial situation of older people depends not only on pensions, but also on the interplay between public and private institutions, individual circumstances and family support.

Health Insurance

Older people are more likely, typically much more likely, to need healthcare than the rest of a population. In most but not all developed countries, the whole population has access to healthcare, either without direct cost to the individual, at rates that are low enough for essentially everyone to afford, or via health insurance. In addition, some countries, such as Australia and the United States, have programmes that make medications more affordable for older people. But in many countries, older people have no reliable, unsubsidized means of paying for healthcare expenses, particularly not of the magnitude they encounter as they age. Healthcare expenses can be devastating to families and are a prime cause of bankruptcy. Individuals and families borrow from friends and relatives, but in poor communities the extent to which such borrowing can serve as a long-term solution is quite limited.

Numerous developing countries have taken steps to provide healthcare or health insurance to the population. The key issue is often the ability of people to pay, either directly for healthcare or indirectly via insurance. In most developing countries, a government that seeks to guarantee the availability of healthcare to the population as a whole will need to develop a system that does not depend substantially on individual contributions. Because older people are all the less likely to be able to pay for healthcare out of their own resources, government-financed healthcare is particularly important for them.

The provision of universal healthcare could potentially resolve the problem of older people's access to healthcare. However, even "universal" programmes often have coverage terms that limit the extent or type of healthcare services available. Older people generally need healthcare services more than the rest of the population. As a result, any limitations are likely to affect them disproportionately unless there are specific provisions focused on ensuring that their healthcare needs are met.

Closely related to healthcare are long-term care of older people and care for people with disabilities. Older people, being more likely to be disabled than other people, are particularly likely to need long-term care. Such care may include healthcare delivery, day-to-day support for carrying out activities of daily living, or programmes that bring meals to older people who are unable to obtain or prepare food. In most countries, older people are unlikely to be able to pay for such care. However, in some countries, such as Germany, Japan and South Korea, long-term care insurance is universally available. Other countries, for example in Scandinavia, have tax-funded strategies in place to help older people age through community-based care. Responding to these needs in a way that goes beyond family-based care will often require government financing. Other alternatives have been explored, including subsidizing family-based care. In this instance, the Austria case is particularly interesting.[20]

Other Forms of Social Protection for Older People

An array of other types of programmes falls under the rubric of social protection and can make a difference in the lives of older people. Transport subsidies or free fares for older people have been implemented in many countries. Tax breaks on both earned and unearned incomes of older individuals, along with special protections linked to wills and transfer of property, can enhance financial security.

Finally, direct cash payments are a form of social protection that can make a large difference. Depending on the recipient's financial condition, such payments can either help lift an elderly person out of poverty or make life more comfortable for someone who is already above the poverty line.

Impediments and Tools for Circumventing Them

The primary impediment to implementing social protection programmes for older people is financial. All countries face financial constraints, so decisions about providing social protection, for older people or any other group, take place in an environment where resources must be used carefully. Pensions, healthcare provision or health insurance and other types programmes involve direct expenditures from the government treasury that can only take place at the expense of other possible uses of public funds.

A second important barrier to meeting the needs of older people via social protection programmes is lack of political will. This absence can arise from a sense of impossibility: why tackle a problem that seems so unlikely to be tractable? This circumstance may not be helped by the attitude of older people who tend to be less agitated about their own plight. Recent "happiness" surveys, whether they be for the United States, Europe or Latin America and the Caribbean, indicate that age and happiness have a U-shaped relationship – happiness declines until sometime in the 40s, when it rises again (after controlling for health).[21] The concern is that this may be a "collective tolerance for bad equilibrium",[22] or simply the resignation that comes with older ages.

A third impediment that is relevant to older people is the absence of a focus on their needs. Even if a country has a commitment to using social protection programmes to reduce vulnerability and poverty, it may not do so in a manner that addresses the specific circumstances of older people.

Several different types of actions can potentially help to overcome these impediments. These include raising consciousness, gathering robust evidence about the nature of the problem, developing a national strategy and marshalling domestic resources to address it, and mobilizing international efforts where necessary.

First, as shown in this chapter, the plight of older people varies across countries and can change rapidly over time. Therefore, it is critical to develop a comprehensive information system in a country about the financial, physical and social situation of older people that can serve as a crucial point of reference for assessing needs, drafting programmes and making rough cost estimates. In many countries, existing census data organized to reflect the circumstances of older people may provide a good start. More ambitious efforts could include elderly-specific surveys. These surveys are now beginning to be applied to emerging economies. For example, the US Health and Retirement Survey has spawned the China Health and Retirement Longitudinal Study (CHARLS).[23] But analysts need not wait for such extensive surveys, because other household-level surveys – for example the Demographic and Health (DHS) and Living Standards Measurement Study (LSMS) Surveys – can be used for age-specific analysis, even if they do not have as much information as one would like. Access to these and other surveys should be as free as possible to enable analysts from developing countries to use them.

Second, the inclusion of older people in national social protection frameworks varies widely across countries. Many emerging economies are only beginning to develop coherent and extensive social protection strategies. Political consensus for such strategies is difficult to achieve during good times when people see no immediate need for social protection, and programmes are often haphazard when forged too quickly during crises.[24]

The present may be an opportune time for mobilizing such a consensus – the financial crisis is still fresh in mind at a time when most countries are already recovering. This effort would require starting with existing national strategies, such as the poverty reduction strategy paper for the poorest countries, or the medium-term expenditure plan for others, and doing an elderly "stress test" on them. Do present programmes cover older people adequately? What more needs to be done? What are the trade-offs? These strategies should be subject to extensive consultation with civil society, as it would be the basis for reforming an implicit social compact.

Third, having gathered the evidence and formulated a strategy, countries should consider the next step: mobilizing domestic resources. Many countries could devote more resources to social protection programmes for older people and for the population as a whole by increasing their tax revenues as a share of GDP. This figure currently varies greatly among developing countries, reflecting, among other things, different power relations among groups within a country. In many cases, domestic sources of income could be tapped and directed toward expanding social protection programmes.

Fourth, many countries can turn to the international community for more help. Financially, countries can work with external partners, such as developed countries that offer aid and international agencies that supply grants and loans, to craft programmes that can begin to address the needs of older people.

The coverage gaps in social protection programmes are large, as huge portions of the population in many countries are not able to live decent lives and, in many cases, are barely able to meet their most basic needs. The International Labour Office sought to estimate the ability of 12 low-income African and Asian countries to fund a basic social protection package covering pensions, basic healthcare, child benefits, social assistance and employment plans. The study found that the countries would be able to do so by spending between 3.8% (Pakistan) and 10.6% (Burkina Faso) of GDP,[25] though such expenditures may not be affordable domestically for these countries.

Joining international campaigns may help with moral suasion in some cases. For example, the Social Protection Floor Initiative (SPF-I), led by the International Labour Organization and the World Health Organization, seeks to help countries establish an "SP (social protection) floor" that sets out a "basic set of rights and transfers that enables and empowers all members of society to access a minimum of goods and services and that should be defended by any decent society at any time".[26]

Conclusion

In low- and medium-income countries, poverty is widespread. Older people are often poor and frequently have inadequate access to healthcare. In high-income countries, older people are often disproportionately represented among the poor.[27] In many countries, changing social circumstances have left older people vulnerable to losing whatever social or personal safety nets they have.

In the face of these difficulties, the need for social protection programmes that address the needs and vulnerabilities of older people is large. But historical circumstances, ongoing financial constraints and lack of political will have combined to limit the extent of existing social protection programmes. The result is a large gap in most countries, and especially in developing countries, between the needs of older people and programmes that can meet these needs.

In addressing this gap, policy-makers will have to grapple with the fact that individual social protection programmes, for example those focused on pensions or health insurance, do not necessarily work as effectively as they could if they were well integrated with each other. Regardless of the set of social protection programmes that are implemented, the overall situation of older people will be affected not only by social protection programmes, but also by individual and family choices and by the full set of public and private institutions whose actions affect older people.

There are several compelling rationales for closing the gaps faced by older people: a moral imperative, respect for basic human rights, and the efficiency gains and impetus to economic growth that can be achieved through social insurance and welfare assistance. Countries on their own may not be able to meet the full range of needs of older people, but they can take some steps to assess these needs and design programmes, often in conjunction with international partners, that make a start in doing so.

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Chapter 18
Human Rights in Older Age

Alexandre Kalache and Richard Blewit

Older persons have the same intrinsic rights as everyone else, but there are specific realities – from limited access to services, education and job opportunities to elder abuse, neglect and abandonment – that render violation of their rights more frequent and cause them to be one of the most vulnerable population groups in any society.[1]Worldwide demographic change is resulting in an unprecedented growth in the number of older persons. Increasing numbers of women and men will be affected directly by age discrimination and ageism. In addition, many of those who will reach old age in the near future will have already, throughout their life course, accumulated disadvantages that will heighten their exposure to discrimination. For instance, a woman who is poor, socially excluded, disabled, single and childless will be at a much higher risk of violations against her rights in older age than, say, a married man from a higher socioeconomic background and educational level.

Since the 1948 Universal Declaration of Human Rights, specific UN conventions on the rights of children, women, indigenous populations, ethnic minorities, immigrants, disabled persons and other subgroups have been adopted. Only one international human rights convention (the International Convention of All Migrant Workers and Members of their Families) mandates against age discrimination.[2] Older people comprise the largest vulnerable population still lacking tailored and binding international legal instruments to ensure that their rights are protected. This is despite today's reality that they are the fastest increasing population subgroup**.** All people are entitled to basic rights simply because they are human, irrespective of age, citizenship, nationality, race, ethnicity, language, gender, sexuality or abilities. This is widely accepted and central to a universal understanding of humanity. The concept of modern human rights has developed over time and has its origins in a wide range of philosophical, moral, religious and political traditions. There is no single historical narrative charting the evolution of rights to the understanding most societies have of them today. When these inherent rights are respected, people are able to live with dignity and equality, and are able to participate in their societies free from discrimination and fear. This results in a "more inclusive, equitable and sustainable development".[3] Article 1 of the Universal Declaration on Human Rights states, "all human beings are born free and equal in dignity and rights».[4] While this equality theoretically does not change with age, the freedoms that all older people should be able to enjoy can only be assured if specific legal mechanisms are in place: the right to equal protection before the law, the right to own property, the right to education, the right to work, the right to participate in government and decision-making, the right to social security, and the right to access appropriate health and social care services. In most countries such legal frameworks are patchy and inadequate – a reality that reinforces the need for more robust international instruments at all levels.

How Are Older Persons' Rights Being Violated?

There is a worldwide toleration of age discrimination and ageism. Age discrimination occurs whenever an individual or individuals are treated differently simply as a consequence of their age. Age discrimination can be directly experienced, as in a refusal of training or education because an individual is deemed "too old", or indirectly, such as in the non-collection or non-presentation of data on morbidity and/or mortality for people over 65 years – as if illness and death after a certain age is of no interest to society. This translates into a failure to develop policies and interventions that could improve health in older age.

Laws mitigating age discrimination do exist in some countries, but they are most commonly limited to employment, and even so, the right to work, with its social criticality, is far from assured. Legislative attention seldom extends to such vital areas as social and health care, long-term support, or provision of other goods and services. The right to adequate social security is significantly under-addressed globally,[5] as is the right to an accessible and affordable healthcare that is appropriate to older persons` needs. In relation to the latter, massive gaps persist, and there is a notable incidence of discrimination and rationing.

At the root of the violations of older persons' rights is ageism – the stereotyping and prejudice against older people – where "people cease to be people, cease to be the same people or become people of a distinct and inferior kind, by virtue of having lived a specified number of years".[6] It ranges from condescension in advertising and films (Yale University studies have shown that such negative stereotypes have a harmful impact on older people's self-esteem, their memory and even longevity)[7] to accusations of witchcraft in some countries that can lead to community ostracism and in some cases murder.

Ageism facilitates an environment in which older people are particularly susceptible to abuse. Despite a regrettable lack of national research and few official statistics, there is compelling anecdotal evidence to suggest that elder abuse is a global epidemic – one that resonates as much in advanced as in emerging economies. There is a clear parallel between elder abuse today and the position that domestic violence, child abuse and violence against women occupied in societies some three or four decades ago. Initially mostly denied by governments worldwide, it took time for studies, with a leadership from the feminist movement, to uncover the ugliness of these realities known to us today.

Elder abuse is considered by some to constitute one of the last grand taboos. Certainly it has been seriously investigated only in recent times. The first international multicentric research[8] was a qualitative study among eight countries in 2002 by the World Health Organization (WHO) and the International Network for the Prevention of Elder Abuse (INPEA). Entitled Missing Voices, the project highlighted elder abuse as defined by older persons themselves, with an emphasis on the institutional – an insidious abuse that was considered by them to be the most difficult to confront and the easiest to be denied.

A growing number of research studies[9] in both the developed and the developing world is starting to reveal the magnitude of the problem in all its forms: physical, emotional, verbal, financial and in the form of neglect and abandonment. However, according to the WHO in August 2011, "the scope and nature of the problem is only beginning to be delineated, many risk factors remain contested, and the evidence for what works to prevent elder maltreatment is limited".[10]

A clear picture emerges from the hodgepodge of studies that have been conducted so far. The American Psychological Association has estimated that 2.1 million older Americans are victims of abuse every year.[11] It is further believed that, for every single reported instance, there are as many as five unreported cases.[12] According to a MetLife Mature Market Institute study (June 2011), financial abuse robbed elder Americans of $2.9 billion in 2010, up 12% from 2008.[13] Studies by the Institut National des Statistiques[14] revealed that at least 10,000 older people, mostly in nursing homes, died prematurely in France as a direct result of the 2003 heat wave. Misleading death certifications almost certainly disguise a much higher number according to the Bulletin de L'Academie de Medecine (2004).[15] In 2001, 156 deaths were reported over a period of only two months in a nursing home in Rio de Janeiro; subsequent investigations revealed all manner of medical and nursing malpractice, which triggered further investigations in other residential care facilities – most presenting similar dysfunctions.[16]

Obviously, not all older people are vulnerable – a generalization which in itself would involve stereotyping and prejudice. Indeed, older people are even less homogenous than other age groups for the simple reason that they have lived longer and had more diverse experiences. Gender plays an important role. Older women and men experience ageing and old age in different ways. The contrasts are not only as a result of social constructions. Biological characteristics can confer diverging susceptibilities to diseases with specific consequences – a greater risk of frailty for women, for example, can lead potentially to an increased vulnerability to abuse. People in their 60s vary widely from those in their 80s. A combination of factors such as culture, educational level, former professional status, disability, poverty, sexuality and gender create a complex and multifactorial heterogeneity which must always be considered when addressing the issues of rights in old age.

Dedicated International Instruments

The United Nations Principles for Older Persons

In 1991 the UN General Assembly enacted the UN Principles for Older Persons, the first document related to ageing to embrace a rights-based approach. This UN document broke new ground by including reference to individual development throughout the life course within the context of longevity. Eighteen Principles within five main groups were adopted:

- Independence: covering aspects such as access to the essentials of life (food, water, shelter, clothing, health care); basic income; family and community support; the opportunity to work and to gain education; safe environments – to include living at home for as long as possible
- Participation: with a focus on societal integration, active participation in the formulation and implementation of policies, the sharing of knowledge and skills with younger generations and the forming of associations and movements
- Care: access to the full spectrum of health and social care, to legal services, to secure environments, and to benefits from family and community care according to societal cultural values
- Self-fulfillment: through access to the educational, cultural, spiritual and recreational resources of society and the opportunities for development of full self-potential
- Dignity: the ability to live in dignity and security, free of exploitation and physical or mental abuse

The Madrid International Plan of Action on Ageing

In 2002, the United Nations convened the Second World Assembly on Ageing, which resulted in the Madrid International Plan of Action on Ageing (MIPAA) with detailed recommendations falling into three priority directions: advancing health and well-being into old age; older persons and development; and ensuring an enabling and supportive environment (physical and social). At the Assembly, countries committed to eliminate all forms of age discrimination, to ensure that "persons, as they age, […] enjoy a life of fulfillment, health, security and active participation in the economic, social, cultural and political life of their societies".[17]

While human rights do underpin both the UN Principles and MIPAA, they are not legally binding instruments. Furthermore, subsequent reviews of MIPAA directives have illuminated inconsistent implementation and pointed to a need for "hard law" rather than these optional mechanisms for which member states do not feel the pressure of obligation.

Many argue that there is a "normative gap" (a lack of provision in human rights law) in relation to the rights of older persons as well as an "implementation gap". Treaty bodies monitoring human rights commitments rarely ask questions about the rights of older persons, and member states rarely include older people in their reports to the UN.

Several regional human rights treaties additionally contain clauses that relate to the rights of older persons.[18] For example, in the European and Inter-American contexts, the provisions for older people's rights are found in social, economic and cultural rights treaties. The African human rights regime protects those rights alongside civil and political rights in the African Charter on Human and Peoples' Rights.[19] In the European setting, reference should also be made to the Revised European Social Charter, which sets out in broad terms a right to social protection.[20]

Despite these developments, the reality in the international human rights arena is that there is a lack of effective focus on the rights of older people.[21] Furthermore, where older persons are referenced in existing treaties, they are expressed in terms of economic, social and cultural rights (ESRC), which are most often regarded as "rights of progressive implementation" – for which full and immediate incorporation into each jurisdiction is not required. They are viewed as goals or aims.[22] The UN Committee on Economic, Social and Cultural Rights felt the need to issue a General Comment in which it deplored the fact that states did not "provide any information in a systematic way on the situation of older persons with regard to compliance with the Covenant".[23]

It is clear that the focus needs to move beyond ESRC to encompass issues that incorporate access to justice and judicial remedy, the right to life, freedom from violence, and more broadly, citizenship itself. Recent discussions have illuminated additional areas that need to be addressed, such as legal capacity, informed consent, long-term and palliative care, access to social and home-based care, as well as the complexities related to violence, abuse, neglect and abandonment.

Strengthening the Rights of Older Persons at International Level

There is a case to be made for strengthening the rights of older people at the international level, given that:

- Existing international human rights laws do not sufficiently protect older person's rights
- Ageism and age discrimination remain prevalent and are unacceptable
- Protection conferred to older persons in relation to their rights does fundamentally improve lives and communities
- Respect for older persons' rights leads to conditions that enable them to participate in and contribute to their own development and that of their families and their communities
- Existing protective instruments are dispersed and often difficult to access
- Human rights provide standards for service delivery

A gradual consensus is emerging toward the need for strengthening older persons' rights at an international level. Within this context, a UN General Assembly resolution was passed in 2010 to establish an open-ended working group, accessible to all member states, with the aim of reinforcing the protection of the human rights of older persons by "considering the existing international framework of the human rights of older persons and identifying possible gaps and how to address them, including by considering, as appropriate, the feasibility of further instruments and measures".[24]

The inaugural meeting of this "open-ended working group" (OEWG) took place in April 2011. It focused on the current worldwide status of older persons' rights, the current international framework, and the existing regional structures and mechanisms. The second meeting took place in August 2011 and emphasized the nature and practice of discrimination, the right to health in older age, social exclusion, violence and abuse against older persons, and mechanisms to increase the social protection of older people worldwide. In both meetings, gaps in relation to older persons' rights were highlighted in four main areas – norms, monitoring, implementation and data collection.

The OEWG meetings have produced a range of proposals to move forward. Need was indicated for further research, studies and data collection; a thorough review of the implementation of MIPAA; full incorporation of older persons into development efforts, for instance, addressing the fact that the Millennium Development Goals make no mention to older persons whatsoever; strengthening existing standards at national and regional levels; and coordination with the Universal Periodic Review process for better monitoring.

Some countries at the OEWG, mostly from the developed world, expressed the view that existing mechanisms (i.e., human rights conventions, treaty bodies and special procedures) are under-utilized but sufficient. Some of them articulated the view that additional mechanisms would overburden the already-strained existing frameworks. In contrast to this position, a body of Latin American countries, led by Argentina, Brazil, Chile and Uruguay, argued that it is a unified structure that is missing and reminded other member states that MIPAA is not an agreement that carries the weight of "hard law". These countries emphasized the additional reality that it is precisely in times of financial crisis when the most vulnerable are in the most need of specific protection. The view was expressed that, in the absence of a unitary binding legal instrument, the inevitable tendency was toward suppression or indifference to the rights of the most silent and disregarded subgroups – a process already visible in many of the developed countries most affected by the current global crisis.

For many in attendance at this second meeting of the OEWG, the main conclusion was that there is a lack of adequate legislation and policies, and that those that exist remain patchy and dispersed. Furthermore, many countries reported problems in implementing national plans. The OEWG is expected to reconvene early in 2012 to continue the discussion and to further consider ways to strengthen the protection of the rights of older persons. The expectation is that additional substantive and persuasive arguments will be presented by member states as well as by civil society organizations strongly committed to the idea of the immediate need for a Convention.

As articulated by Lindsay Judge in 2008: "[It] is arguable that when the rights of certain groups are so obscured, often not through any malign intent but simply the result of a particular set of societal values, there is a basis for a new instrument."[25]

Conclusion

The recent OEWG meetings revealed a growing enthusiasm for the appointment of a Special Rapporteur – an expert designated by the UN and mandated to report on thematic human rights issues to the Human Rights Council. It is intended that she or he would be an independent officer with the freedom to make an objective contribution to the ongoing discussion towards strengthening older people's rights globally. In addition, the Special Rapporteur would:

- Be tasked with deepening the understanding and knowledge of normative and implementation gaps in the international human rights framework as it applies to older people
- Directly contribute to the ongoing discussions of the OEWG and inform member states about pathways to strengthen the international human rights system
- Use a global mandate to carry out country-specific visits and research where they contribute to advancing the knowledge of the international human rights structure

The move towards a rights-based framework has been gradual and remains incomplete. Undoubtedly, international human rights law can significantly advance social change. As nations incorporate human rights norms into their legal systems, a transformative global growth in human rights consciousness occurs. And as Israel Doron points out, "a rights discourse is a power discourse: it enables, empowers and it stresses dignity not need".[26]

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Chapter 19
Ageing and Urbanization

John Beard, Alex Kalache, Mario Delgado and Terry Hill

The early part of the 21st century will see two notable milestones. In 2008, for the first time, the majority of the world's population lived in cities,[1] and around 2015, the number of people age 65 and over will come to outnumber children under age five. This will be the first time since the beginning of recorded history that older people have outnumbered young children.

These events highlight two major underlying demographic shifts: urbanization and ageing. Both of these trends are most dramatic in what are currently low- or middle-income countries. This is where the majority of older people already live, and where the fastest ageing is occurring. Thus, emerging economies such as China, Thailand and Brazil will soon have a proportion of older people in their population similar to countries such as the United States. However, these emerging economies will have only about one-third of the time that the United States had to build the infrastructure necessary to meet the needs of this older population.

Ageing and urbanization are also closely related. It is expected that one-quarter of urban populations in less developed countries will be over the age of 60 by 2050. In developed countries, 80% of older people already live in urban areas.[2] This might be a mixed blessing for older people who, for example, may have access to resources not available in less dense settings, but who may also feel more vulnerable to threats to their safety. In addition, older people living in urban areas often lack the social networks that are more commonly available to those living in smaller, more traditional communities.

Importantly, these transitions are occurring in the midst of other significant global changes. Globalization, in particular, has transformed economies in both low- and high-income countries. Older workers may find themselves in shrinking "old" industries, and may suffer from employer perceptions that they are obsolete or not worth the investment to retrain. These pressures may be amplified in times of economic difficulty.

These trends are also drivers of significant social transformation. For example, the proportion of young to older family members has shrunk; women have joined the work force, thereby further diminishing the pool of potential carers for their older relatives if they become sick or frail; and, at the same time, younger people have become more mobile, and, in many countries, feel less obliged to support older generations.

How will these changes impact the health, well-being and social engagement of older people? Because so many will live in cities, this chapter explores the influence the urban environment may have on older people and whether cities can be designed to foster more active and healthier ageing.

Ageing in the City

There are many possible ways in which the urban environment may influence the health and well-being of older residents. Indeed, older people may be particularly vulnerable to the influence of urban characteristics. They may spend more time in their neighbourhoods; have increased biological, psychological, and cognitive vulnerability; have changing patterns of spatial use; and rely more on community sources of integration.[3]

Living in an adverse neighbourhood can influence health by directly increasing the likelihood of experiencing personal stressful events such as trauma, violence or unemployment.[4] Physical conditions such as urban decay, physical disorder and high levels of crime may generate more chronic levels of stress and fear.[5],[6]

However, good street design, access to public transport and access to public buildings can make mobility easier. Interesting destinations and welcoming neighbourhood shopping may encourage individuals to remain engaged with their local community and maintain supportive social networks. Such features may also encourage walking and other physical activites[7],[8],[9] which not only reduce the risk of chronic disease, but may also exert protective effects by strengthening the physiological systems of older adults and reducing functional limitation, for example from osteoarthritis.

While older people generally express a desire to remain active and live independently in their own communities for as long as possible, an older person's ability to do so is determined not just by their functional capacity (i.e., their physical and mental health), but also by their environment and their ability to adapt to it.[10] If an individual has lost some physical function, a city can provide the physical and social environment that allows them to remain – or prevents them from being – independent. For example, disabled access to public transport and public buildings can be used by even severely disabled older people to allow them to participate in social activities.

A positive residential environment may also provide social resources that buffer the impact of life stressors,[11],[12],[13] present readily accessible and affordable nutrition that makes it easier for older people to eat a healthy diet, or contain physical characteristics such as trees and parks that foster a sense of well-being and provide a recuperating environment that supports resilience. Prevailing cultural norms may steer residents to healthy, or in some cases unhealthy, behaviours and outcomes.[14]

Urban environments can also influence the social cohesion of local communities. Economically disadvantaged neighbourhoods have often been associated with higher levels of social disorder,[1516] lower social cohesion and less informal social control over problem behaviours.[17] These, in turn, may impede the development of the social networks that can buffer individuals from the stressors they face on a daily basis.[18]

Because many of these characteristics can be readily modified by urban design or through different types of community development, numerous initiatives have been put in place to modify cities to become more supportive of older populations. While distinct in their emphases, these generally share the common goal of addressing needs related to health (accessible and affordable health and health care services, opportunities to be physically active and embrace healthy life styles); continuing education (models of lifelong learning that foster the acquisition of new skills, new knowledge); participation (access to relevant information, public transportation, recreational programmes, social connections, volunteer opportunities, places to worship, being valued and respected); and security (home and community safety, transportation safety, financial security, affordable housing and services).

Creating Urban Environments that Work for Older People

The Global Network of Age-friendly Cities

In 2007, the WHO undertook a project to define the characteristics of a city that may make it age-friendly.[19] The result is the WHO's Global Initiative on Ageing and Urbanization – the WHO Global Network of Age-friendly Cities. Older people and care providers in over 30 cities around the world identified eight domains of city life that might influence the health and quality of life of older people (Table 1).

Table 1. WHO framework for assessing the age-friendliness of a city

Eight Domains of Age-friendliness
1. Outdoor spaces and buildings
2. Transportation
3. Housing
4. Social participation
5. Respect and social inclusion
6. Civic participation and employment
7. Communication and information
8. Community support and health services

Source: World Health Organization. Global Age-Friendly Cities: A Guide. World Health Organization, Geneva, 2007.

This approach was expanded in June 2010 with the establishment of the WHO Global Network of Age-friendly Cities.[20] To participate in the Network, cities need to commit to an ongoing program of assessing and improving their "age-friendliness". For the purposes of the Network, cities are defined in a very broad sense as municipalities with the necessary authority to administer the changes needed to foster age-friendliness.

The Network links participating cities to WHO and to each other, facilitates the exchange of information and best practices, and fosters the development of interventions that are appropriate, sustainable and cost-effective for improving the lives of older people. Hundreds of cities and communities, most from developed countries, have become connected to this Network, and the original conceptual boundaries have become more encompassing to now include notions such as sustainability and lifelong learning.

Numerous innovative twists to the original model have been developed by participating cities. For example, New York City has created an Age-friendly New York City Commission composed of public- and private-sector leaders.[21] Among numerous other initiatives, the Commission works with local businesses to make the private sector more age-friendly (Table 2).

Table 2. New York City's guide to becoming an age-friendly business

Products and Services
Offer food, products and/or services that are appropriate for older adults
Make discounts or special offers available for older adults when possible
Offer drop-off and delivery services
Provide respectful human contact, in person and on the phone, and offer extra customer service for older adults
Communicate through printed materials, the Internet and signs in large, clear font in appropriate languages
Participate in the community
Physical Facilities
Have a place where customers can sit and rest
Provide a drink of water if asked
Allow customers to use a restroom
Provide adequate lighting at the entrance and throughout the business
Avoid heavy doors or offer electronic doors
Be mindful of stair safety: stairs (if there are any) have handrail, are deep or have ramps
Place products on shelves which are reachable, or readily offer help reaching items
Moderate excessively loud music and noise
Keep sidewalks free of dirt, snow, leaves, clutter and other obstacles

Source: World Health Organization. Global Age-Friendly Cities: A Guide. World Health Organization, Geneva, 2007.

Manchester City in the UK has created Valuing Older People, a multi-agency programme that challenges Manchester's public agencies, businesses and communities to place older people at the centre of extensive plans for the regeneration and reshaping of the city.[22] Key components of this initiative are to tackle age discrimination and to create "lifetime neighborhoods".

Smaller communities are also active in the age-friendly cities movement. For example, the Projet Villes Amies des Aînés (Age-friendly Cities Project) of the Canadian province of Quebec now involves small rural communities, in addition to large cities such as Montreal.

However, with a few notable exceptions, this explosion of innovative ideas has been centred in developed economies. A major challenge for this programme is to transfer the notion of age-friendliness to communities in less developed settings. One factor that may help is the rapid socioeconomic development that is accompanying population ageing in countries such as China and Brazil. The rapid availability of new resources, and in many cases the associated dramatic changes in urban form, offer scope for significant intervention. This can be seen in Shanghai, where rapid economic growth has funded the provision of universal pensions and healthcare for older people, and where an ambitious urban policy will see the creation of widespread and accessible community centres for older residents.

Perhaps the most challenging and potentially rewarding ambition would be to develop models that can support older people in the large slum areas that are associated with many megacities in low- and middle-income countries. Many of the features advocated by the age-friendly cities movement are low-cost and socially oriented. It is quite possible that innovative delivery models could result in major changes in the quality of life of the world's poorest elderly.

The City as Part of a Broader Political Framework

Many aspects of urban living that affect the quality of life of older persons go beyond municipal boundaries; for example, state or national housing policies, public transportation, access to health and social services, recreational facilities, etc. One of the more recent developments emerging from the Age-friendly Cities approach is to broaden it to encompass the regional, state or national level.

Examples include the Andalucia Province of Spain, the State of São Paulo in Brazil, and the State of South Australia. Similar strategies applied in all three states. Once political interest at the broader level had been stimulated, formal commitment was sought. When granted, this was followed by the establishment of a multi-sectoral working party including, at a minimum, government representatives (officers), civil society organizations (with emphasis on those working with or for older persons), and academic institutions.

In all three states, engagement of the academic sector followed, and a protocol was developed to ensure excellence in applying rigorous common methodology and devising mechanisms for monitoring and evaluation. This was done in close consultation with the multi-sectoral working party to ensure continuing interest and engagement from the government sector and with the participation of older persons throughout the development of the project and implementation of activities.

São Paulo is the largest state in terms of population in Brazil and includes over 600 municipalities grouped in 17 regional authorities. It would have been impossible to start the implementation phase in all of them simultaneously. Instead, at least one city representative of each of the various regional authorities was selected (usually the largest, economically most important, and with thriving local universities). These cities now act as a "head" from which the principles of an age-friendly city roll out as a ripple effect. The capital of the State of São Paulo, São Paulo, is one of the world's megacities, with a population of over 9 million plus and many more within its metropolitan area, which consists of a dozen other municipalities. The strategy was to select some barrios, or local districts, and four of the municipalities in Greater São Paulo and to use their experiences to broaden the project for the whole metropolitan region.

Andalucia is also a large province, and the same strategy was used, except that two cities per regional authority played the role of "heads", a large one and a town within the region. In South Australia, the state government's cabinet launched emblematic initiatives and interventions, thus combining this top-down approach to the bottom-up strategy of listening to older people who are critical of the Age-friendly Cities movement.

Developing the Best Infrastructure for Ageing Populations: Inclusive and Integrated Design

The planning and design of infrastructure can have a big impact on people's quality of life. Infrastructure can be better understood as being part of a set of complex interactions that inform the city as a whole along with housing, land-use planning, utility networks, resource and waste management and social networks. The integrated design of these interactions can have either a positive or negative impact on the end user. Unfortunately, older and disabled people are more likely to feel the negative impacts of bad design that does not take into account their special needs. Inclusive design sets about creating environments that take into account and respond to different users' needs.

The UK Design Council defines inclusive design as "a means of designing for transport that is dignified, accessible, affordable, safe and easy to use". It means considering all of the various pieces that help to create an overall comfortable travel experience, such as the provision of shelters, seating at shelters, lighting/visibility of signs and audibility of systems, the availability of emergency assistance, ramp accessibility for the physically impaired, and a neighborhood that works for everyone regardless of their age. More importantly, inclusive design creates a viable way for anyone to get around and takes into account how the design of infrastructure can affect the overall quality of life for older people.

Accessibility and connectivity. The location of infrastructure is determined at a local, regional or even national scale and is affected by governing bodies' investment decisions. It is important that, when the location of transportation alternatives is being decided, decision-makers consider the relationship between necessary amenities such as healthcare, grocery, and pharmaceutical services and the ability of the elderly to physically access those services through accessible and quality transport links. And, just as critical, is the ability of the elderly to participate in social aspects of society so that they are not cut off and excluded from the vital social benefits of living in a community.

Mobility: getting around. The absence of barriers on streets is just as important as access to trains and buses. Neighbourhoods need to have well-designed and well-managed streets that do not act as barriers to movement and do not restrict or exclude the participation of elderly citizens in daily social and economic life. The availability of safe, well-marked bicycle paths are just as important for the elderly as they are for other cyclists.

Environmental quality, health and well-being. The environmental and health impacts of noise and air pollution associated with transportation infrastructure as well as general feelings of safety and security need to be considered with respect to the elderly. Features such as lighting can help to promote the safety of users and can turn an unsupervised, formerly derelict place into a more visible and safe environment. Other access features such as well-lit, visible bridges across roads and rails can also contribute to a general feeling of safety and well-being.

Sense of place. Perhaps least well-defined or understood is the sense of place that older populations can develop over a long period of time. The design and development of new infrastructure can alter the whole look and feel of an area, which can challenge the way an older person feels able to function within their community. Infrastructure design has the possibility of creating a fluid connection between a community's former version of itself and its future iteration, so that the ageing still feel connected to their environment and can be excited by future opportunities.

Conclusion

The dramatic demographic changes that will occur during the first half of the 20th century will see much older and more urbanized populations in almost all countries. Theory suggests that urban environments can be used to foster more active and healthy ageing, and many cities in developed countries are starting to put in place programmes that can create more age-friendly environments.

What is lacking so far is hard evidence of a positive impact of these initiatives and models that can be adopted in even the poorest settings.

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Chapter 20
International Migration and Population Ageing

Hania Zlotnik

Normally, a population grows because of the excess of births over deaths, denominated "natural increase". International migration can also contribute to population growth when a country receives more immigrants than the number of emigrants it loses. The difference between the number of immigrants and the number of emigrants is called "net migration".[1]

Table 1. Distribution of countries by fertility and development level and the type of combination of natural increase and net migration they experienced during 1990-2010.

		Natural increase positive		Natural increase negative	
		Net migration		Net migration	
Fertility and development level	Total	Negative	Positive	Negative	Positive
Low-fertility developed	41	7	20	8	6
Low-fertility developing	33	21	11	—	—
Intermediate-fertility developed	4	0	4	—	—
Intermediate-fertility developing	61	44	17	—	—
High fertilty	58	40	17	—	—
Developing countries	152	105	45	—	—
Developed countries	45	7	24	8	6
Low-fertility developed	100	17	49	20	15
Low-fertility developing	97	64	33	—	—
Intermediate-fertility developed	100	0	100	—	—
Intermediate-fertility developing	100	72	28	—	—
High fertilty	98	69	29	—	—
Developing countries	99	69	30		
Developed countries	100	16	53	18	13

Source: United Nations, World Population Prospects: The 2010 Revision, CD-Rom Edition, POP/DB/WPP/Rev.2010.

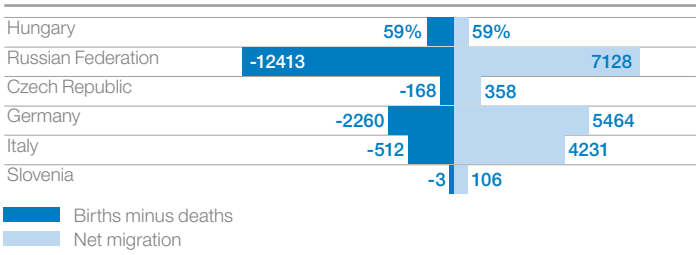
Notes: All high-fertility countries are developing countries.

Two developing countries, Papua New Guinea and the Democratic People's Republic of Korea have zero net migration.

Because natural increase and net migration are both defined in terms of differences, each of them can be positive or negative. In virtually every developing country today, natural increase is positive (births exceed deaths), and the majority (70%) experiences net emigration – that is, their net migration over the period 1990 to 2010 is negative (Table 1). Even among developing countries that have below-replacement fertility, only 33% have had positive net migration over the past two decades.

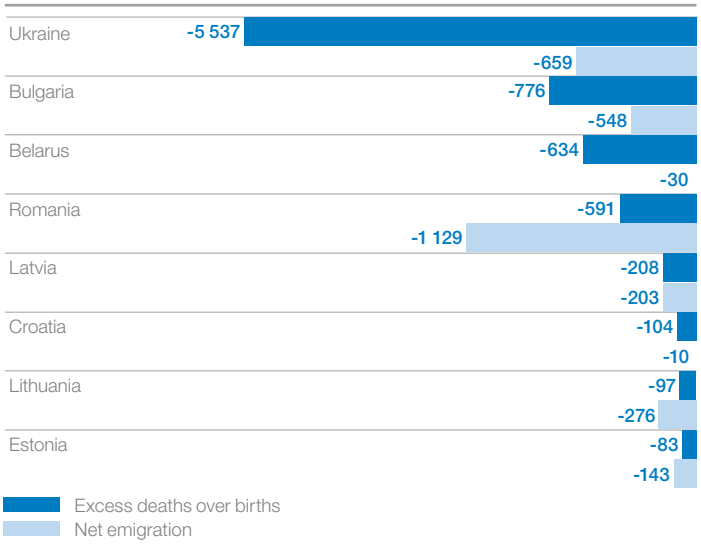
In contrast, 66% of developed countries have experienced positive net migration during that period. Among the 14 developed countries where deaths exceeded births during 1990 to 2010 (that is, where natural increase was negative), only six attracted more immigrants than the emigrants who left and therefore recorded positive net migration during 1990 to 2010 (Figure 1). That is, net migration contributed to counterbalance the excess of deaths over births in less than half of the developed countries experiencing negative natural increase during 1990 to 2010.

Figure 1. Countries where net migration reduces the excess of deaths over births, 1990-2010



Source: United Nations, World Population Prospects: The 2010 Revision, CD-Rom Edition, POP/DB/WPP/Rev.2010.

Figure 2. Countries where net migration accelerates population decline, 1990-2010



Source: United Nations, World Population Prospects: The 2010 Revision, CD-Rom Edition, POP/DB/WPP/Rev.2010.

Furthermore, in the other eight developed countries experiencing negative natural increase during 1990 to 2010, net emigration was negative and hence contributed to accelerate population decline (Figure 2). Those eight countries are located in Eastern and Central Europe and all are former members of the Eastern bloc.

It has been argued that the persistence of below-replacement fertility and the reduction of the population that eventually ensues, together with the ongoing ageing of the population, would by themselves produce the conditions that would attract migrants. As the cases of Belarus, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Romania and Ukraine indicate, demographic dynamics by themselves do not necessarily set the stage for attracting migrants. If over the past two decades most developed countries with low fertility were also net importers of people, it is because their economies fared well during most of that period.

Replacement-level fertility is the level of fertility needed to ensure that every woman has one daughter who survives to the mean age of procreation. That is, it is the level of fertility needed to ensure that each generation is replaced by a generation of the same size. The replacement level varies according to the level of mortality. In high mortality populations, replacement level can be four children or more per woman. When mortality in childhood and the young adult ages is low and virtually everyone survives to their late 20s, replacement level is close to 2.1 children per woman. Because even if no one died before age 30, women would still have to have slightly over two children on average to have one daughter on average (more boys are born than girls), fertility levels at or below two children per woman are below replacement level, irrespective of the mortality levels that a population experiences.

The financial and economic crises that struck in 2008 have provided further evidence that demography is not the main driver of international migration. As economic stringencies have taken hold in the developed countries that had been the major magnets for migrants before 2005, migrant inflows have dropped markedly and net migration has declined, even if it has not become negative in all the major receiving countries of the developed world.

These observations should be borne in mind when assessing the feasibility of using migration as an instrument of demographic policy. The question of whether migration can be used to modify the age structure of a population has attracted the attention of several researchers over the past three decades. Yet most of the researchers who have considered the issue have concluded that it would be difficult – politically, socially and even in terms of the management of international migration – to admit continuously and over a long period the relatively high numbers of migrants of particular ages that would be required to counterbalance in a significant way the ongoing population ageing.

The following sections review what is known about the effects of migration on population ageing and the insights that models provide about why international migration is unlikely to be the solution for population ageing.

Migration and the Age Distribution of the Population at Destination

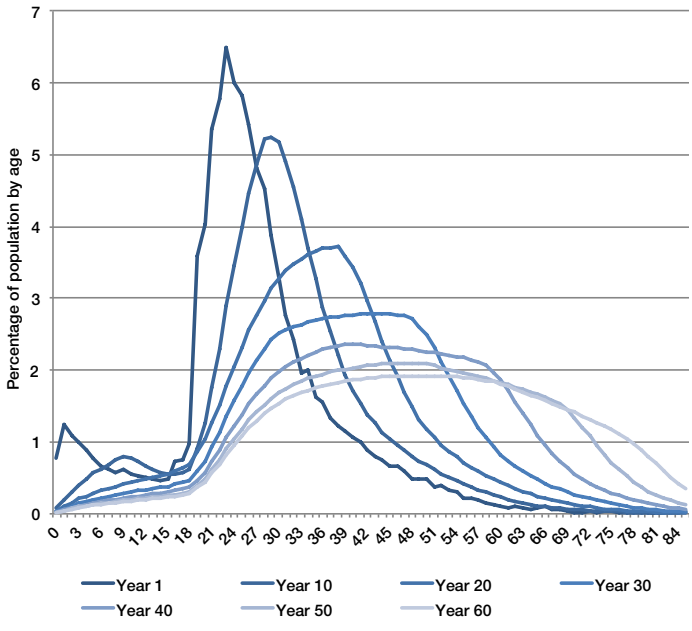
Because migration is selective by age, it has the potential to modify the age distribution of the population at destination both directly, by the addition of people to particular age groups, and indirectly, if the fertility of migrant women differs from that of their non-migrant counterparts in the country of destination.

Newly available estimates of the migrant stock, classified by age and sex in all countries, allow an assessment of the direct contribution of migration to changes in the age distribution. Before considering those data, however, it is useful to use simplified assumptions to describe what happens to the age distribution of migrants. Consider the population of an uninhabited island that receives a wave of migrants on year one. From there on, the island receives the same number of migrants every year with the same age structure as that of the first wave. The children born on the island to migrants are not considered part of the migrant population (they did not "move" to the island). The whole population is subjected to fixed mortality risks that do not change over time. Figure 3 shows how the age distribution of the migrant population on the island changes over time.

Note that on year one, the population has a distribution that is highly concentrated in the young ages (20 to 29) but, as time elapses, the concentration of the migrant population in a given age group is dampened by the ageing of previous cohorts of migrants. Just 30 years after migration started, the age distribution of the migrants has ceased showing a peak, and after 60 years, the migrant population has a very flat distribution after age 30. This simplified example shows that, as migrants age, even maintaining a constant inflow of relatively young migrants will not make the distribution of the population younger.

To achieve a rejuvenation of the population, the number of young migrants added to the population every year would have to keep increasing in order to mimic the effect of above-replacement fertility, which is at the root of the exponential growth of population that prevents population ageing.

Figure 3. Simulated evolution of the age distribution of migrants under constant migration by age and sex



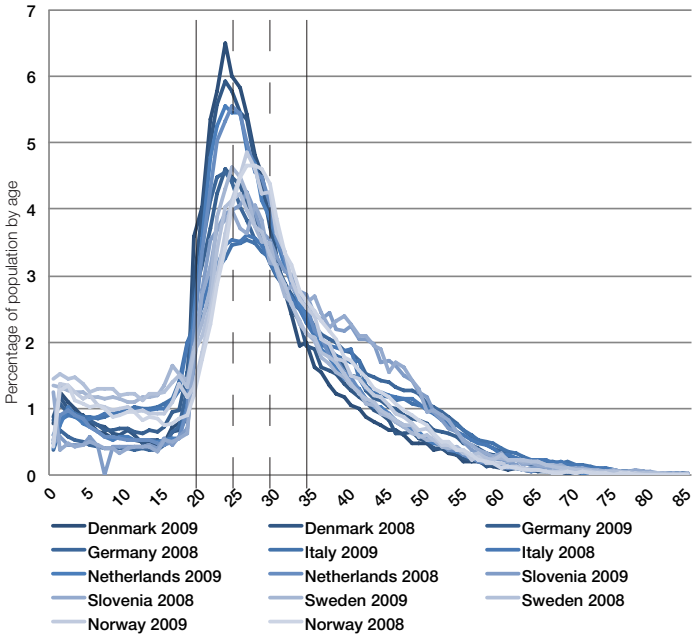
Source: Calculations by author.

International Migration – Counteracting Population Ageing?

Migration is selective by age – that is, people leaving a country are not a random sample of the population. On the contrary, they tend to be highly concentrated at ages 20 to 29 (Figure 4). In addition, the majority of international migrants move in order to work abroad – that is, they intend to join the economically active population. Even migrants that ostensibly move for other reasons, such as to join family members abroad or to seek asylum, tend to join the labour force at destination.

These two characteristics of migrant flows – the concentration of migrants at young ages at the time of the move and the high labour force participation of migrants at destination – are the basis for arguing that admitting international migrants can be one of the strategies to reduce some of the potentially detrimental effects of population ageing, in particular the dropping proportion or the outright reduction of the number of persons in the labour force. In addition, it has been argued that migration can increase the economically active population so that social security systems based on a pay-as-you-go model remain viable.

Figure 4. Age distribution of migrant inflows, selected countries



Source: Eurostat, Immigration by sex, age group and citizenship, 2011, obtained from http://appsso.eurostat.ec.europa.eu/nui/setupModifyTableLayout.do

Discussion of whether and to what extent international migration can or should be part of a strategy to address the consequences of population ageing is of long standing.[1,2,3,4,5] In the late 1980s, when it became clear that fertility in most European countries and in nearly all other developed countries had not only fallen below replacement level, but was remaining well below replacement level for the long run, demographers in those countries turned their attention to the possible role of international migration in counteracting population ageing.

Concomitantly, as migration flows to European countries rose again after having reached a low during the early 1980s, policy-makers became interested in the subject. The late 1980s and the 1990s witnessed important changes in migration flows in Europe, resulting in part from major historical events (the dissolution of the Soviet Union, the reunification of Germany and the war in the former Yugoslavia) and from the increasing prosperity of countries in the region related to globalization and the expansion of the European Union.

The time was ripe, therefore, when in 2001 the United Nations Population Division issued a report, Replacement Migration: Is it a Solution to Declining and Ageing Populations?,[6] which generated considerable debate, especially in Europe. By making a parallel between the terms "replacement fertility" and "replacement migration", the report was often misrepresented as implying that the populations of Europe would be "replaced" by migrants.

Yet the actual message of the report was quite different and corroborated the findings of other researchers who had considered the subject before: in order for a population to keep the age structure produced by sustained population growth, that growth had to continue. If fertility was too low to sustain it, the number of migrants that had to be admitted needed to be large, sometimes very large. Although migrants are young when they arrive, they will themselves age if they are allowed to stay in the country of destination. Consequently, migration inflows have to be sustained over long periods to have an effect in slowing population ageing.

The following section reviews in more detail the results of key studies assessing the impact of international migration on population ageing.

Assessing the Impact of Migration on Population Ageing

Assessing the impact of international migration on the age distribution of a population is not straightforward because of the deficiencies of statistics on international migration and the fact that migration has both a direct effect on the age distribution (the addition or subtraction of migrants to particular age groups) and an indirect effect through the fertility of migrants. One way of assessing the overall effect of migration is to take a population at a given moment, project it without migration for over a certain period, and then compare the actual population with that obtained by assuming that migration was zero.

Le Bras carried out that exercise to assess the impact of post-war migration in several countries.[7] The period considered in each case began in 1946, or a year close to that date, and ended with the census carried out in the early 1980s in each of the countries considered. For the countries listed in Table 2 this was a period of large net gains associated with migration because Australia, Canada, France, Germany, Sweden and to a lesser extent Belgium, experienced major inflows of migrants during the 1950s and 1960s.

For European countries, that was the era of "guest worker" migration, when migrants were admitted as workers, and family reunification was restricted. For the overseas countries of immigration, migration was a major component of nation building over the whole period considered. In addition, by the 1970s fertility was low or declining rapidly in all those countries. The slight increase of fertility associated with the baby boom of the late 1950s and early 1960s had run its course, and all the countries considered had reverted to low fertility. By 1975 to 1980, all of them had below-replacement fertility.

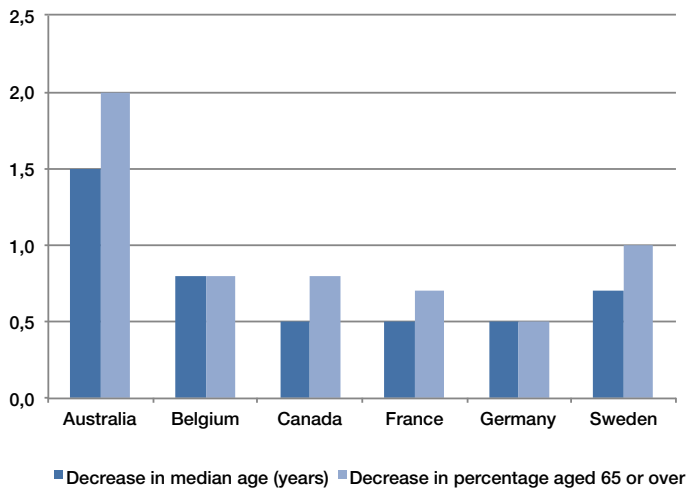
As the results shown in Table 2 indicate, international migration did contribute to reducing population ageing in all the countries considered. Thus, in all of them the actual median age[8] of the population is lower than that of the population projected under the assumption of zero migration (the "closed" population). However, the reductions achieved are small, particularly for the European countries (Figure 5). In five of the six countries considered, the median age dropped by less than one year because of migration, and the proportion of the population aged 65 years or over was reduced by less than 1% after more than three decades of sustained migration flows. Furthermore, net migration gains over the period were substantial, accounting for at least 32% of population growth in Canada and France and for as much as 68% in Germany. That is, although the effect of net migration gains was in the right direction, it was modest at best in terms of reducing population ageing.

Another perspective on the same issue is obtained from the results of the projection scenarios produced by the United Nations Population Division in 2001.[9] The scenarios were developed to assess how many migrants would be needed to achieve different objectives – to maintain:

- The size of the overall population constant at 1995 levels
- The size of the working age population (persons aged 15 to 64) constant at 1995 levels
- The support ratio, that is, the ratio of the population aged 15 to 64 to the population aged 65 years or over, from falling below three
- The support ratio constant at the level it had been in 1995

The results obtained for one region (Europe) and the eight countries considered are summarized in Table 3, which shows the estimated and projected support ratio for the populations considered. For 1995, 2010, and the medium and zero-migration variants for 2050, the data shown refer to the most recent set of population estimates and projections prepared by the United Nations Population Division.[10] The other data are the result of simulations prepared in 2001 on the basis of the 1998 Revision of World Population Prospects. Updated simulations would have produced somewhat different numbers, but the general conclusions derived from the simulations would be the same.

Figure 5. Effects of post-war migration on population ageing, selected countries



Source: United Nations, World Population Prospects: The 2010 Revision, CD-Rom Edition, POP/DB/WPP/Rev.2010.

Table 2. Impact of post-war international migration on the age distribution and the median age of selected populations assessed by comparing a closed population with zero migration and the actual population

Country	Year	Population	0-19	20-64	65+	Median age	"Support ratio (20-64/65+)"	Population growth (percentage)	Natural increase (percentage)	Percentage of population growth due to net migration
Australia	1981	Closed	31,3	56,9	11,8	34,4	4,82	1,94	0,98	49,5
		Actual	33,7	56,5	9,8	32,9	5,77			
Belgium	1982	Closed	26,4	58,8	14,8	38,1	3,97	0,45	0,26	42,2
		Actual	27,3	58,7	14,0	37,3	4,19			
Canada	1981	Closed	31,4	58,2	10,5	33,7	5,54	1,86	1,26	32,3
		Actual	32,0	58,3	9,7	33,2	6,01			
France	1983	Closed	29,2	56,9	13,9	36,5	4,09	0,84	0,57	32,1
		Actual	29,8	57,0	13,2	36,0	4,32			
Germany	1984	Closed	23,4	61,4	15,2	39,5	4,04	0,62	0,20	67,7
		Actual	23,5	61,8	14,7	39,0	4,20			
Sweden	1984	Closed	24,8	57,1	18,1	39,9	3,15	0,50	0,28	44,0
		Actual	25,3	57,6	17,1	39,2	3,37			

Source: Herve LeBras, Demographic impact of post-war migration in selected OECD countries. In Migration: The Demographic Aspects. Organisation for Economic Cooperation and Development, Paris, 1991, pp. 15-28.

The results presented in Table 3 indicate that net migration gains can contribute to increasing the potential support ratio, therefore reducing somewhat the effects of population ageing. However, in the countries considered, the support ratio projected for 2050 is lower than that estimated for 2010 in all scenarios, except for the one where migration is used to maintain the support ratio constant at the level it had been in 1995. According to that scenario, migration has to be very high in some countries to maintain the favourable support ratios their populations had in 1995. The potential support ratio or support ratio for short is generally defined as the ratio of the population of working age, usually considered to be that aged 15 to 64, to the population of retirement age, namely, that aged 65 or over. It can also be the ratio of the population aged 20 to 64 to that aged 65 or over. Either ratio is an indicator of the maximum number of workers per older person in a population. At the early stages of population ageing, the potential support ratio is high, with five or more potential workers per older person.

Thus, the Republic of Korea, with a population of 48 million in 2010, would have to import an annual average of 93 million migrants during 1995 to 2050 to maintain the high support ratio it had in 1995. Even in a country like Germany, whose support ratio in 1995 was a moderate 4.4 persons of working age per older person, the net annual migrant intake would have to average 3.4 million during 1995-2050 to maintain such a ratio. That number of migrants is over 30 times higher than the number projected in the medium variant (111,000 annually).

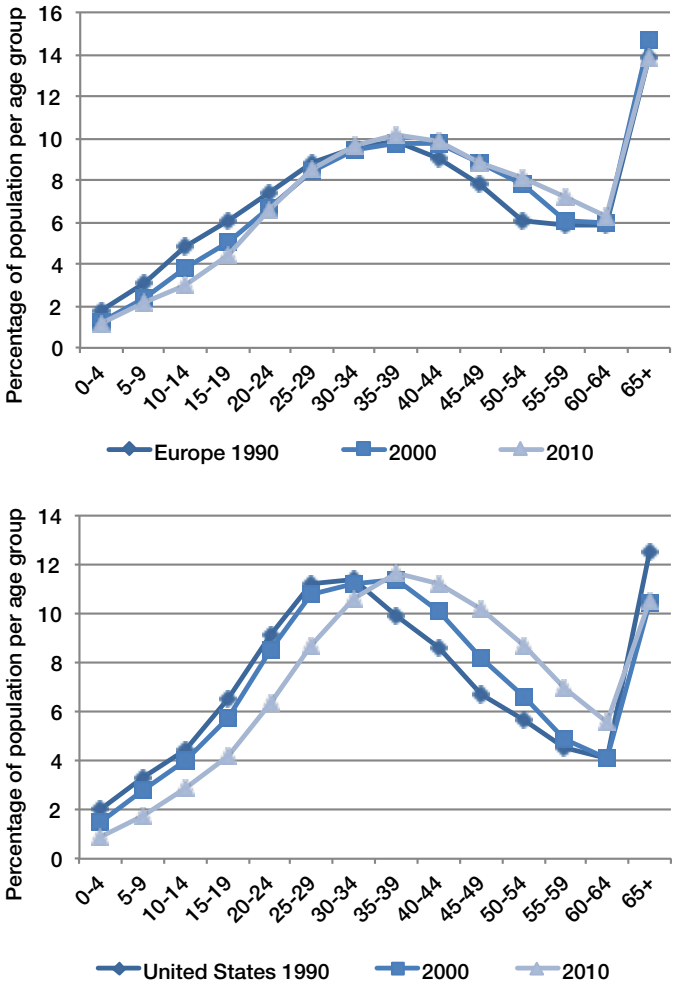
With the exception of the United States, the migration levels projected in the medium variant of the 2010 Revision fall far short of the levels required either to maintain constant the overall population or to maintain constant the population of working age (15 to 64). In other words, although migration is expected to contribute somewhat to slow population decline and population ageing in a number of low-fertility countries, it is unlikely to counteract significantly the powerful dynamics of population ageing.

The Ageing of Migrants

An additional consideration is that migrants themselves age. Newly available estimates of the age distribution of the migrant population show that it has, itself, been ageing even in countries such as the United States where net migration gains are substantial. Figure 6 shows the changing age distribution of the migrant population in Europe and in the United States for 1990, 2000 and 2010. In both cases, the distribution has been shifting to older ages. Note, however, that these distributions do not incorporate the secondary effect of migration, that is, the children of migrants born in the country of destination, which are not part of the migrant population.

Lastly, several authors have noted that the trends in migration necessary to achieve demographic objectives, such as stabilization of the size of the working age population, involve major fluctuations in the number and age composition of the migrants involved, fluctuations that would be very difficult to time properly in practice.[11,12]

Figure 6. Age distribution of migrants in Europe and the United States,1990, 2000 and 2010



Source: United Nations Population Division, Trends in international migrant stock: Migrants by age and sex, CD-Rom, POP/DB/MIG/Stock/Rev.2010.

Conclusion

International migration is shaped by multiple forces, one of which is the need for workers in particular sectors of the economy. Because migration is selective not only with respect to skills and qualifications, but also with respect to age, it has been thought that migration can be used to counterbalance some of the effects of population ageing by, in particular, helping to reduce labour shortages. Actual migration trends have shown that dynamic economies can indeed rely on migrants to satisfy their labour needs, but those needs are not necessarily the result of population dynamics. Economic factors are often more important determinants of the need for additional workers than population trends, which are of long gestation and take a long time to play themselves out.

Thus, migrants have not necessarily been flowing to all countries with slowly growing or even declining populations. Whereas many countries experiencing such population trends are important destinations for migrants, not all of them attract enough migrants to counterbalance their emigration flows. Furthermore, migration flows are often volatile, responding as they do to current economic and political developments in both countries of destination and countries of origin. It is therefore by no means certain that migration will necessarily contribute to reduce the effects of population ageing in all the countries that are already far advanced in that process and, even if it does, its effects are likely to be small.

Endnotes

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2 Didier, B. (1989) Regulation the age structure of a population through migration. Population, 44(1), 23-37.

3 OECD, Organisation for Economic Cooperation and Development. (1991) Migration: The Demographic Aspects. Paris: OECD

4 Schmertmann, C. P. (1992) Immigrants' ages and the structure of stationary populations with below-replacement fertility, Demography, 29(4), 595-612.

5 Gesano,G. (1994) Nonsense and unfeasibility of demographically-based immigration policies. Genus, 50(3-4), 47-63.

6 United Nations. (2001). Replacement Migration: Is it a Solution to Declining and Ageing Populations? Available at: http://www.un.org/esa/population/publications/migration/migration.htm

7 Le Bras, H. (1991) Demographic impact of post-war migration in selected OECD countries. In: Migration: The Demographic Aspects. Paris: Organisation for Economic Cooperation and Development. pp. 15-28.

8 The median age is the age that divides the population into two equal parts, that is, half the population falls below that age and half above it. Population ageing makes the median age rise. In "young" populations, the median age is typically below 25 years.

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10 United Nations. (2011) World Population Prospects: The 2010 Revision. CD-Rom Edition. POP/DB/WPP/Rev.2010.

11 Didier, B. (1989) Regulation the age structure of a population through migration. Population, English Selection, 44(1), 23-37.

12 Wattelar, C. & Roumans, G. (1991) Simulations of demographic objectives and migration. In: Migration: The Demographic Aspects. Paris: Organisation for Economic Cooperation and Development, pp. 57-67.

Table 3: Results of simulated scenarios of future population change according to different assumptions about future migration, 1995-2050

	1995	2010	2050					
Region or country			Medium variant	Zero migration	Constant population	Constant population aged 15-64	15-64/65+ not lower than 3.0	Constant 15-64/65+
Europe	4,8	4,2	2,1	2,0	2,4	2,6	3,0	4,8
France	4,3	3,9	2,3	2,1	2,3	2,5	3,0	4,4
Germany	4,4	3,2	1,8	1,6	2,3	2,4	3,1	4,4
Italy	4,1	3,2	1,6	1,5	2,0	2,3	3,0	4,1
Japan	4,8	2,8	1,4	1,4	2,1	2,2	3,0	4,8
Republic of Korea	12,0	6,5	1,6	1,7	2,5	2,8	3,0	12,6
Russian Federation	5,5	5,6	2,6	2,5	2,9	3,1	3,0	5,6
United Kingdom	4,1	4,0	2,5	2,2	2,5	2,6	3,1	4,1
United States	5,2	5,1	2,8	2,5	2,6	2,7	3,0	5,2
Europe	-	738	1 068	-	1 821	2 934	4 274	25 203
France	-	63	96	-	27	99	292	1 705
Germany	-	82	111	-	324	458	736	3 427
Italy	-	61	179	-	235	357	638	2 176
Japan	-	127	45	-	312	609	1 724	10 064
Republic of Korea	-	48	-16	-	27	117	211	93 617
Russian Federation	-	143	158	-	508	650	484	4 675
United Kingdom	-	62	148	-	48	114	249	1 087
United States	-	310	1 030	-	116	327	816	10 777

Source: United Nations. (2001). Replacement Migration: Is it a Solution to Declining and Ageing Populations? Available at: http://www.un.org/esa/population/publications/migration/migration.htm

Chapter 21
Financial Education and Older Adults

André Laboul

The financial landscape of the beginning of the 21st century is increasingly characterized by a significant transfer of financial risks to individuals and a growing sophistication of financial products. This is happening during a time of great uncertainty and when financial literacy remains low in many jurisdictions. Consumers of financial services, particularly the elderly, are ill equipped to face their ever-increasing responsibilities and often overestimate their financial skills and awareness.

The gap between levels of financial education and the rapidly evolving financial marketplace has wide economic, financial and social implications, including for financial stability. A survey by the Organisation for Economic Co-operation and Development (OECD) has revealed that the lack of consumer financial education played an important role in aggravating the effects of the financial crisis.[1] There has been considerable policy work and action at the national and international levels to promote financial education and consumer protection. This chapter will highlight selected features of financial education for the elderly, a vulnerable group, focusing in particular on the risk of inadequate retirement income.[2]

Financial Education and the Elderly

Much emphasis has been placed on developing the financial literacy skills of young people.[3],[4] However, there is an even more urgent need to support the development of such skills in adults, and particularly older people, who may not have kept up with the pace of change and face significant risks that could influence their financial well-being. The approaches will vary between generations with a growing relevance for older generations of consumer protection compared to financial education, which may come too late.

The older population is an especially heterogeneous group, with large variations in characteristics such as income, education, gender[5] and ethnicity. This group includes some of the most socially excluded, with a higher than average likelihood of health issues and disabilities and reduced physical access to financial services.

Older adults are particularly exposed to financial risks and financial abuses. In 2004, a US study concluded that the number of reported cases of abuse of older persons living in domestic settings had increased dramatically in the past two decades.[6] It noted that a frequent form of elder abuse is financial exploitation that can occur through the misuse of powers and guardianships, illegal transfer of property, and outright fraud and theft. The study found that financial crimes against older persons are particularly difficult to examine because they are often unreported by victims and professionals.

A 2006 national prevalence study of elder mistreatment in the United Kingdom reached similar conclusions.[7] More recently, a survey conducted by the Investor Protection Trust in 2010[8] found that half of older Americans exhibit one or more of the warning signs of current financial victimization, and almost half of those aged 65 or over provided incorrect answers to at least two out of four questions relating to basic investment knowledge.[9]

Older generations often lack the up-to-date knowledge necessary to make the best financial planning decisions. Research has suggested that for adults aged 50 and older in the United States financial knowledge declines with age.[10] While 75.9% of those aged 50 to 60 gave a correct response to a question demonstrating a basic understanding of compound interest, this positive response rate fell to 67.2% of 60- to 70-year-olds and just 57.6% of those aged 70 and over. Similar patterns were observed for other basic knowledge questions. This knowledge deficit makes the elderly especially vulnerable to financial exploitation, including investment fraud, and comes at a time when inevitable changes affect older people – a decline in health, isolation, visual, auditory and motor declines, poor mobility and cognitive decline. All of these factors impact the capacity of older people to make informed financial choices.

The financial literacy needs of older adults are particularly acute in terms of up-to-date knowledge and information presented to them in an understandable, jargon-free way to protect them against fraud, scams and abuse. Older people also need to increase their awareness of the circumstances under which they should seek external help or advice about financial matters, and where they seek it.

Challenges for Older Generations

There are some particular challenges when targeting financial education for older generations, due to their declining mobility or low access to educational sources such as the Internet. While older people typically benefit from increased leisure time, their resources and mobility are often reduced. For example, research in the United Kingdom indicates that almost 10% of adults aged between 60 and 75 reported difficulty shopping for groceries, while this percentage increases to nearly 20% for the 80 to 84 age group and more than 30% for the 85 to 89 age group.[11] Even those who are mobile find it difficult to walk to information and education sites if they live outside large urban areas.

The Internet is an appropriate delivery tool for financial education and could potentially help to overcome this mobility problem. Large numbers of adults access information online. However, the same research looking at adults aged 52 and older showed that use of the Internet and email is still quite low among older people. While 68% of adults aged 52 to 54 were using the Internet, the percentage dropped across each age band, and only 38% of those aged 65 to 69 reported such use.[12] It may therefore be unwise to see the Internet as the best way to reach the elderly. In terms of credit, research undertaken in the State of Victoria, Australia, in 2008[13] concluded:

Older people generally have less access to technological advances such as Internet banking and need face-to-face services in accessible locations. Older people, and particularly farmers in rural areas, are more likely to resist seeking help from financial counsellors and related services, and such services must be actively marketed to them.

While general principles and guidelines fully apply, financial education should be attuned to the needs and specificities of older people.[14] Their financial education and literacy needs vary widely according to their health, living arrangements, employment situation, dependency, gender and ethnicity. Financial education programmes should be delivered in a range of environments and tailored to the contexts facing older people at the various stages in their lives.

These programmes should be developed in consultation with appropriate community organizations and professionals working with older people. Educational materials should be available in a variety of formats appropriate to the requirements of older groups. Older generations, if well informed, could be a key educational asset by sharing their experience with younger generations and helping to develop their financial literacy.

Financial Consumer Protection

Financial education addressed to older generations may come too late to be of any benefit or may have only a limited impact. This makes financial consumer protection especially relevant for this vulnerable group that is often the target for financial abuses. Beyond the need for information and training about elder abuse, specific protections for very old people should be considered in light of their reduced capabilities. These protections could include extended cancellation periods, requirements for a suitability assessment by financial service providers before providing a product or service, request for participation – including information and consent – of a relevant third party for any major financial decisions made by very old individuals,[15] and special dedicated and speedy complaint-handling and redress mechanisms.

While academic literature about elder abuse is expanding, further data and research are needed to address these issues. Policy-makers should consider further action to protect this growing segment of the population.[16] The creation of an Office of Financial Protection for Older Americans by the new US Consumer Financial Protection Bureau is a good step in this direction.[17]

Financial Education and Retirement Income

Inadequate retirement income is one of the most important risks facing older people.[18],[19] Increasing longevity and unplanned health-financing needs may add further pressure to inadequate asset accumulation. This comes at a time when ageing populations are challenging the sustainability of public pension schemes, and private pension schemes are increasingly transferring the risks to individuals.

Individuals save for retirement in a variety of ways, including public pensions, occupational pensions and personal retirement saving plans. However, pensions and retirement savings plans, though vitally important for individual and social welfare, are some of the least understood financial products, making some level of financial education imperative. The level of financial education and type of information required will vary according to the characteristics of the retirement saving product. For example, a deeper level of understanding seems necessary for pension systems where individual choice is involved and where public pension schemes provide only a limited safety net in terms of retirement income. Less knowledge and information may be required where individuals still rely on sound public pensions and do not have individual responsibility for investment choices.[20]

Surveys indicate that individuals are not saving and planning sufficiently to ensure an adequate retirement income.[21] A lack of financial planning is not only common among young respondents, but also among older adults. A survey in the United States shows that while the proportion of those engaged in financial planning increases with age, only 51% of respondents 45 to 59 years old and not yet retired had tried to calculate how much they needed to save for retirement.[22] This figure is particularly worrisome because the closer one is to retirement, the less scope there is to take corrective action.

In addition, surveys indicate that individuals are not saving wisely.[23] An important trend in many countries has been the rise in the number of workers participating in defined contribution (DC) plans where the contributions, but not the benefits, are defined. Many of the workers in these plans need help. DC schemes transfer the longevity and investment risks to households and individuals. In the absence of proper financial literacy, people may not take appropriate actions in terms of their contribution levels and investment choices and may find themselves without adequate resources when they retire. They may also be exposed to market volatility. Retirees with a DC pension portfolio heavily invested in equities would suffer significant losses if they had to convert the portfolio into an annuity at an inopportune time, such as the height of a financial crisis.

Financial education on retirement income issues should be provided as early as possible.[24] Retirement income implies long-term decision-making that cannot be made at the last minute. Retirement income depends on an active accumulation phase that spans a large number of years. Moreover, financial education itself takes time and is a lifelong process. But there is also scope in financial education for financial decisions taken late in the phase-out period, i.e., when assets are being consumed, and when action may still be needed to assure a stable and secure flow of retirement income.

More generally, financial consumer protection and alternative mechanisms will be needed as people get older and become more vulnerable at a time when financial education may no longer help address financial challenges.

Communication and Awareness Campaigns

The risk of inadequate retirement income calls for proper communication and awareness campaigns. Governments should use national pension communication campaigns at times of major pension reform to inform individuals about how changes will affect pension entitlements and help individuals take any necessary actions. Campaigns need to be targeted as broadly as possible, as a lack of understanding of pension issues tends to be fairly widespread.[25] Specific programmes targeted at the most vulnerable groups, such as older generations, migrants and those with the lowest income and savings levels, can also have a greater impact. Such programmes should strive to make individuals aware of their limited financial knowledge and about pension products in particular, with stress placed on the risks of having an inadequate retirement income.

Future retirees need to know the benefits they will receive when retiring in order to make possible changes in their contributions. In DC arrangements, individuals may face many complex choices that will determine the level of their retirement income, ranging from how much to save to the kind of benefit payout option to choose. Apart from being provided with ready access to plan documents and other relevant contractual material, individuals should receive regular, individualized benefit statement information, which should provide clear benefit projections under prudent assumptions. Such projections should ideally include information on how benefits could be increased, should additional contributions be made to the DC plan or should the retirement age be delayed.[26]

Disclosure materials should be readily understandable by pension plan members and their beneficiaries. This may be a particularly challenging task for members with very low levels of financial literacy, who may not even understand basic concepts such as compound interest or the difference between a share and a bond, and for vulnerable groups such as older people.[27]

However, communication is not the panacea. The lack of financial literacy and behavioural factors will affect the nature of awareness of the risks and the willingness to take action or even to be informed. The case of the Swedish “Orange Envelope” in connection with pensions reform illustrates the limitation of communication campaigns.[28] The Swedish authorities introduced the concept of an “Orange Envelope” for communicating important pension information. In 2006, the Swedish social insurance agency conducted a survey on the use of this envelope among people receiving it. This envelope contained essential information for their future retirement income. While most people knew they received this very visible envelope, 20% did not open it, 50% read only some of it and 20% compared the results with previous year. Impact has been improved since then.

Education and Consumer Protection

Hence, communication policies need to be complemented by other actions such as financial education programmes. Research from the United States suggests that it may be particularly important to build retirement human capital via seminars, educational programmes and retirement planning products.[29]

Nevertheless, the research notes that one-size-fits-all programmes are unlikely to successfully address saving shortfalls, particularly among the elderly, given the very different patterns that can be discerned by sex, age, educational levels and race/ethnicity. Instead, programmes must be targeted to address fundamental differences in preferences, saving needs, financial knowledge and sophistication.

Financial education measures may not be sufficient. Other mechanisms may be needed to address the behavioural factors mentioned above and the potential decreased capabilities of older generations. Among such possible additional mechanisms, default retirement planning mechanisms including automatic pension enrolment should be considered. They convert the option from opt-in to opt-out.[30] Other options may include lifestyle products that convert the portfolio to less risky investments as the retirement age approaches.

The rights of future and existing retirees need to be properly protected. The OECD’s Core Principles of Occupational Pension Regulation promote access to plan participation, equal treatment and entitlements under the pension plan, vesting rights, pension portability and rights of early leavers, entitlement process and rights of redress. These rights may vary in relation to programme features (mandatory or voluntary, defined benefit or defined contribution); the extent of subsidization; or the primary or supplementary nature of the source of retirement income.

However, the protection of accrued benefits and timely notice of change in future benefit accruals should be essential rights, especially for older populations reaching retirement age, as they will often no longer be in a position to address any significant changes to their pension rights.

A Word on Longevity

Life expectancy in OECD countries has increased an average of 22 years in the last century during a time when people tended to work less. This development is generally good news, but can pose problems for retirement income sustainability. Longevity risk is the risk that the ageing population outlives its retirement income. Increased longevity affects any pension scheme or retirement plan, the main difference being whether the government (and thus the whole population), employers, or individuals bear the longevity risk.

This risk calls for improved communication on benefits with due account of longevity projections based on updated mortality tables. There is a clear need to strengthen financial education and awareness in this field. This is especially important where increases in longevity are not compensated by increases in working life.

Longevity risk is a key issue in the phase-out period, especially for DC plans. While individuals may be reluctant to buy annuities, and insurers reluctant to offer such products, a minimum level of annuitization of balances accumulated in such plans may be necessary as a default measure to protect against longevity risk. This minimum level needs to be coherent with the overall structure of the pension system.

Recent OECD work suggests the desirability of setting, as a default measure, the purchase at the time of retirement of a deferred life annuity with longevity insurance that would start paying out at a very old age, e.g., at 85 years old.[31] The remaining assets could then be used for programmed withdrawals, thus providing for continued flexibility, liquidity, provision of bequests and access to potential portfolio investment gains.

Conclusion

The elderly are very vulnerable to financial risks and abuses. They need to be aware of these risks and prepared to face them. This calls for adequate financial education and awareness, adapted to the specificities and heterogeneity of this population group. Financial education regarding retirement income should be provided early on, when proactive action is still possible, but also during the phase-out period. This is all the more important as population ageing and increases in longevity put enormous pressures on public retirement income schemes, and as private pension schemes increasingly transfer financial risks to individuals.

The vulnerability of older generations to abuse, fraud and changes affecting their pension rights, with limited room to recover or adapt, calls for stronger financial consumer protection and related dedicated policies.

Endnotes

1 International Network on Financial Education. (2009) Financial Education and the Crisis: Policy Paper and Guidance. Available at: http://www.financial-education.org/dataoecd/48/31/48646555.pdf

2 The OECD (Organization for Economic Co-operation and Development) has been leading the international development of principles and guidelines on financial education since 2003. See in particular the OECD Principles and Good Practices for Financial Education and Awareness (2005). This work has recently been carried out through the International Network on Financial Education (INFE) composed of representatives from governmental institutions from 94 economies and operating under the aegis of the OECD Committee on Financial Markets and the OECD Insurance and Private Pensions Committee (see www.financial-education.org). The recent crisis triggered new work, for instance, the OECD Recommendation on Financial Education and Awareness in Credit. More recently, the G20 recognized the importance of reinforcing financial consumer protection. At the 2011 Cannes Summit, the G20 leaders endorsed a report by the Financial Stability Board on consumer finance protection and the high-level principles on financial consumer protection prepared by the OECD Task Force on Financial Consumer Protection, together with relevant international bodies.

3 OECD, Organization for Economic Co-operation and Development. (2005) Recommendation on Principles and Good Practices for Financial Education and Awareness. Available at: http://www.oecd.org/dataoecd/7/17/35108560.pdf

4 OECD. (2011) Guidelines on Financial Education at School and Guidance on Learning Framework. Available at: http://www.oecd.org/dataoecd/15/57/48493142.pdf

5 There are differences in financial planning behaviour by gender that are relevant to old age. A MetLife study on elder financial abuse notes that "women were nearly twice as likely to be victims of elder financial abuse as men." See: Metlife. (2011) The Metlife Study of Elder Financial Abuse: Crimes of Occasion, Desperation, and Predation against America's Elders. Available at: http://www.metlife.com/mmi/research/elder-financial-abuse.html#key%20findings

6 Rabiner, D. J., Brown, D. & O'Keefe, J. (2004) Financial exploitation of older persons: policy issues and recommendations for addressing them. Journal of Elder Abuse & Neglect, 16(1), 65-84.

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8 See: Investor Protection Trust. (2010) IPT Elder Investor Fraud Survey. Available at: http://www.investorprotection.org/learn/research/?fa=eiffeSurvey. The same study found that 20% of Americans aged 65 or older already have been taken advantage of financially in terms of an inappropriate investment, unreasonably high fees for financial services, or outright fraud. See:

9 For international cases of general elder mistreatment, see: Podneiks, E., et al. (2010) Elder mistreatment: an international narrative, Journal of Elder Abuse & Neglect, 22, 131-163.

10 Lusardi, A. (2008) Financial literacy: an essential tool for informed consumer choice? Working Paper, Dartmouth College. Available at: http://www.dartmouth.edu/~alusardi/Papers/Lusardi_Informed_Consumer.pdf

11 Atkinson, A. & Hayes, D. (2010) Consumption patterns among older consumers. International Longevity Center-UK. Available at: http://www.ilcuk.org.uk/files/pdf_pdf_156.pdf

12 Ibid. See also: Berry, R. (2011) Older people and the internet. International Longevity Center-UK. Available at: http://www.ilcuk.org.uk/files/pdf_pdf_181.pdf

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14 See for instance OECD and INFE principles, good practices and guidelines. Available at . http://www.financial-education.org/document/5/0,3746,en_39665975_39666038_39846725_1_1_1_1,00.html .

15 Relatives may not be necessary the relevant persons as they compose a very significant share of abuse perpetrators.

16 As this segment will represent an increasing part of the voting population, policy-makers will have further incentives to act.

17 See also Rabiner, D. J., Brown, D. & O'Keefe, J. (2004) Financial exploitation of older persons: policy issues and recommendations for addressing them. Journal of Elder Abuse & Neglect, 16(1), 65-84, for interesting recommendations to address financial exploitation of older persons.

18 Antolin, P. (2009) How to ensure adequate retirement income from defined contribution pension plans. Financial Market Trends. 97(2).

19 Antolin, P. (2008) Ageing and the Payout Phase of Pensions, Annuities and Financial Markets. Financial Market Trends, 95(2).

20 OECD, Organisation of Economic Co-operation and Development. (2008) Improving Financial Education and Awareness on Insurance and Private Pensions. Available at: http://www.oecd.org/document/8/0,3746,en_2649_15251491_41210376_1_1_1_1,00.html

21 Ibid.

22 Lusardi, A. (2011) Americans' Financial Capability. Working Paper, Pension Research Council, Wharton School, University of Pennsylvania. Available at: http://www.pensionresearchcouncil.org/publications/document.php?file=936

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24 For recommendations on financial education related to private pensions, see: OECD. Organisation of Economic Co-operation and Development. (2008) Improving Financial Education and Awareness on Insurance and Private Pensions. Available at: http://www.oecd.org/document/8/0,3746,en_2649_15251491_41210376_1_1_1_1,00.html

25 Ibid.

26 OECD, Organisation of Economic Co-operation and Development. (2012) Report on pension statement and communication of pension risks. (Report not yet published)

27 The OECD will issue a study on pension communication policies at beginning of 2012, with related recommendations.

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30 Sometimes there is a positive contribution of the same "adverse" behavioural factors. Inertia, for instance, will keep the future retiree in the default option.

31 Antolin, P. (2009) How to ensure adequate retirement income from defined contribution pension plans. Financial Market Trends. 97(2).

Chapter 22
Technology and Ageing

Gerald C. Davison and Aaron Hagedorn

Gerontechnology is the study of the interaction between technology and the unique challenges and needs of older people faced with limited physical or cognitive abilities. This emergent interdisciplinary field has developed in recent years from a confluence of three factors: a dramatic increase in life expectancy, with many more older people in relatively good health and often demanding more from life than earlier cohorts; the availability of sometimes ingenious new technologies that can support longer and higher-quality lives; and an appreciation of the importance of how changing the physical environment can profoundly influence how well people live.

The ability to create and continually enhance technology is a defining characteristic of humanity and one of the key reasons for the unparalleled success of our species. In recent years, various technologies have been introduced for use by older adults, caregivers, health service providers and service providers to the elderly to enhance and improve domains of human activity such as housing, communication, transportation, work, health and leisure. The last few decades have also seen an exponential rise in technological capacity to develop new electronic approaches that enable users to be more productive, have easier access to content on demand, or use technology to substitute for tasks that would otherwise require a human to do at either great cumulative expense or great emotional strain.

Under the aegis of gerontechnology are such innovations as smart homes, social robots, assistive technology, telemedicine, m-health (mobile phone based monitoring), telehealth and a range of software applications that enhance safety or quality of life for older people faced with some limitations. The devices can be wearable, portable, implantable or stationary. Sometimes the technology is software that can operate on a range of computers or smartphones; sometimes it involves sensing devices including motion detectors, actuators or accelerometers.

Gerontechnologists include a broad range of scholars, engineers and other specialists. Many are professionally linked through the International Society for Gerontechnology, based in the Netherlands. Research in the field is published in a range of scholarly journals, including prestigious medical, engineering and social science journals, as well as through a dedicated journal known simply as Gerontechnology (www.gerontechnology.info).

There is no shortage of opportunities for gerontechnology to accommodate some of the more serious issues associated with ageing, including declines in many systems of the body; losses in muscle strength; reductions in bone density that predispose older people to higher injury risk from a fall or accident; and declines in the acuity of essential senses such as vision, hearing and taste, as well as delayed reflexes in response to extreme hot or cold. Gerontechnological approaches can also help older adults maintain mental acuity long after retirement.

New Challenges Posed by Health and Longevity

The population in every developed country is rapidly ageing due to declines in birth rates and improvements in health and longevity. Life expectancy in most developed countries is approaching 80, which is vastly different from the turn of the last century, when it was just 47 years in the United States. Throughout human history, life expectancy was generally around age 30.[1] Living beyond age 50 was an accomplishment enjoyed by about only half of the population born in 1900, whereas 94% of people alive today will live at least that long.[2] Dovetailing with the ageing of the population are complex problems that require extensive assistance for periods of time that can stretch over more than a decade.

The developing world is beginning to experience serious changes in population structure as well, as young adults leave rural villages in search of better paying work, leaving older adults with fewer potential caregivers. However, wireless phones have enabled communication across long distances in places where landlines never reached. The same issues and opportunities exist in the developing world as well, but daunting challenges also exist vis-à-vis economics and infrastructure.

While many people live to advanced ages in excellent health, as each decade passes there are increased risks of disability and dependency. In the not-so-distant past, older people could rely on their children to care for them. However, rapid cultural shifts in developed and developing countries such as China and India have led to changes in family caregiving values and to distant migration of adult children in search of economic opportunities.

In lieu of dependence on close relatives for support when faced with old age disability, older adults can potentially turn to paid assistance from professional caregivers in their home, or move to medical or specially-designed residential facilities for older or disabled people. In recent years, more and more older adults have been exercising the choice of "ageing in place", that is, continuing to live in their homes with the support of assistive devices and various technologies that enhance their ability to communicate with others, should they be faced with circumstances that need outside intervention.

Scientists, engineers and entrepreneurs have collectively seen this as an opportunity to design innovative products and services that will enable older people to live with greater independence. A range of issues has already been studied regarding older people's acceptance of new technology. The data suggest that while age does play some role in predicting technology acceptance, issues of computer anxiety, self-efficacy, fluid intelligence and crystallized intelligence are even more important.[3] Even in cases where individuals do not have technical knowledge or ability, they may be willing to use a technology if it is perceived to be useful or easy to use.[4]

Housing and Daily Living

Smart Homes

Smart homes integrate a range of monitoring and supportive devices to enable people to age in place more effectively. These homes have technologies that can generally be grouped into six categories: (i) physiological monitoring, which usually focuses on vital signs, blood sugar and bladder and bowel output; (ii) functional monitoring for emergency detection and response, including measures of general activity level, gait, and meal intake, or identifying extended time periods without activity that might be cause for concern; (iii) safety monitoring and assistance; (iv) security monitoring and assistance; (v) social interaction monitoring and assistance; and (vi) cognitive and sensory assistance.[5]

The following are some of the most notable university-based smart homes:

- The Aware Home Research Initiative at the Georgia Institute of Technology constructed a three-story, 5,040 square-foot house to design, develop and evaluate future domestic technologies in a realistic environment. The home evaluates ubiquitous computing with computer-monitored sensors that can infer activity patterns, including emergency detection, or identify when people with memory impairment may need assistance.[6]
- The University of Florida has the Gator Tech Smart House for the elderly and disabled that uses environmental sensors to monitor for safety and security, reminder and prompting technologies, temperature sensors, activity monitoring, fall detection and biometric technologies for physiological monitoring.[7]
- The MavHome project at the University of Texas at Arlington is focused on developing context prediction to identify the risk of future events, such as a potential fall. Robotics and artificial intelligence are tested to investigate activity patterns.[8]
- The multi-agent systems laboratory at the University of Massachusetts at Amherst has developed independent intelligent agents that help automate some daily tasks currently done by humans, with emphasis on improving efficiency and quality of service. These agents include water heaters, dishwashers and vacuum cleaners that operate autonomously, deployed in a simulated intelligent-home environment.[9]
- At the Massachusetts Institute of Technology, the House_n group, also known as the "house of the future", proposes a smart services delivery system that passively collects data on activities in the home that can be used to identify moments when human intervention might be needed.[10] The system includes sensors that help collect data about activities of daily living (e.g., bathing, dressing, eating and toileting) and algorithms for recognizing and classifying activities that are not directly observed, but inferred, based on patterns of motion sensor activity.
- In Osaka, Japan, the smart house of Dr K. Matsuoka automatically detects unusual events that may have been caused by an accident or a disease through its 167 sensors that translate raw sensor signals into behavioural data.
- At the University of Missouri-Columbia, the Ageing in Place project, which includes the Senior Care and TigerPlace initiatives, allows older adults to remain in the home environment of their choice with the help of healthcare services. The main goal of this project is to conduct interdisciplinary research to implement effective methods of caring for the elderly who desire to "age in place". For example, the TigerPlace residence has wireless sensors connected to small computers that detect functional decline of older persons.
- Supportive robots hold potential for assisting in vital activities including a new Chinese robot that can cook and deliver a variety of complex dishes,[11] or the robot Pearl, which reminds people about activities such as eating, drinking, taking medicine and using the bathroom.[12]

Balance and Fall Prevention

Gerontechnology is dramatically changing our understanding of balance and fall prevention. In recent years, accelerometer technology has become common in smart phones and gaming devices, opening up new opportunities for balance testing and fall monitoring, as well as improvements in our understanding of age-related changes in gait.[13]

Canes and walking sticks have been preventing falls for millennia, but new approaches have been developed that address balance in novel ways. While knee and ankle orthotics have been shown in multiple studies to help individuals with ambulation,[14],[15] foot orthotics could be considered the most helpful for assisting the elderly with ambulation. Many older adults ignore foot care, either because they cannot reach their feet to care for them properly or because they mistake foot pain, misshapen appearance or odd coloration as simply an inevitable part of growing old. More than three-fourths of older adults suffer from significant foot problems that predispose them to discomfort, reduced range of motion and impaired ambulation.

Foot orthotics can increase range of motion and improve ambulation as well as effectively combat foot pain, stress and trauma in the elderly through weight diffusion and weight dispersion.[16] Truly advanced orthotics with power-assisted joints are forming a new type of robotic exoskeleton that could enable people with limited strength to walk further distances. These include Cyberdyne's Hybrid Assistive Limb (HAL) and Berkeley Bionics' human exoskeleton.

A wide range of devices has been developed that can better assess gait and balance, including gait mats, electronic insoles, pressure sensitive walkways and optical motion-capture systems.[17] Balance training can be enhanced or integrated into everyday activities using the same technology found in the Nintendo Wii balance board.[18] A combination of motion-detection technology and algorithms can passively monitor activity and signal caregivers when there appears to have been a fall.[19]

A wide range of approaches has been studied for detecting falls, including specialized belts and mercury tilt switches to detect a lying position,[20] impact-sensitive flooring and low-cost motion-detecting sensors that can be active 24 hours a day and do not depend on a person remembering to wear a specific device. Several motion-detection based systems with special software programmed to analyse patterns of motion, infer lack of activity as a potential fall, and send notification to a caregiver, are already commercially available.

Communication

Many older adults spend significant time alone or live in locations where they have limited ability to socialize. Research has shown that robots can serve an important role for social activities.[21] A number of robots designed specifically for interacting with older people have been designed and tested for various purposes that include: rehabilitation and exercise;[22,23] calming and relaxation for those with Alzheimer's Disease, as seen in Paro the robot seal;[24] or primarily for entertainment, with a secondary benefit of monitoring for emergencies, as seen in the Nao robot.

Social media have changed the face of the Internet. One of the most rapidly growing user bases for services such as Facebook are baby boomers and their older parents.[25] Older people in the United Kingdom who are connected to the Internet use it a great deal. The fastest growing age group on Facebook are older adults. Communication with other generations that have migrated elsewhere can be facilitated by cheap connectivity and videoconferencing, and phones have been designed with features that allow listeners to slow down the speed at which they hear a caller.

Support groups on the web can lead to increased knowledge of one's health condition and improved psychological wellbeing and health status.[26] Some hospitals encourage their long-term recovery patients to use Care Pages, an online blog that allows patients to share their experiences with a select group of friends and family and receive messages of support.

Personal Mobility and Transportation

Assistive Technologies

Research has demonstrated that assistive technologies (AT) can help decrease the need to use some health services. An analysis of the 1994 National Long Term Care Survey found that the use of AT equipment was associated with needing fewer hours of help from another person, including paid home health aides;[27] slower declines in physical abilities;[28] and reduced hospital and nursing home costs.[29] Assistive devices can also lead to improved self-care and daily living skills,[30] which in turn relieves stress on caregivers and family members.[31]

However, technology can be a double-edged sword. Power wheelchairs, for example, can contribute to more rapid physical decline.[32] Data from some of the devices that detect lack of motion as a potential health problem may be incorrectly interpreted as a fall, when a person may simply be resting or sleeping. This could lead to false alarms, which is not a trivial issue for family members monitoring their parents.

Older people may reject technology because they think they do not need it, or the device itself might not be user-friendly enough. Cohort effects are also a factor: tomorrow's 80-year olds may be more inclined to use technology than those reaching older ages today.[33]

Health and Home Care

Telehealth

Telemedicine, or telecare, provides connectivity with clinicians to improve the management of chronic disease in the comfort of an older person's home rather than in hospital.[34] Telehealth consists of telephone, videoconferencing and Internet-based services to provide specialist referrals, patient consultations, remote patient monitoring, medical education, and consumer medical and health information through networked programmes.

Due to concerns about compliance with the US Health Insurance Portability and Accountability Act of 1996, designed to protect patient privacy, video transmission of health visits in the United States occurs only under highly restricted circumstances. If future reimbursement policies allow for videoconferencing to be a billable medical visit, it is likely that chronic disease management can be a more pervasive mode of health service use.[35] This has been successfully introduced in countries such as Australia.

Technology is expected to lead to more cost-effective care through the use of telehealth monitoring[36] and passive remote activity monitoring via algorithms, which in many cases can potentially delay or prevent institutionalization,[37] leading to significant savings for healthcare systems.

Memory and Brain Fitness

The normal ageing process affects various forms of memory, though there may be extensive opportunity for plasticity in memory abilities in advanced ages under the right conditions.[38,39] Some of the common age-related changes include declines in working memory[40] related to slowed speed of processing,[41] limits in capacity,[42] and difficulty inhibiting irrelevant information.[43] Spatial abilities, tested by mental rotation exercises such as fitting furniture through a tight doorway, decline with age,[44] and this decline is associated with confusion when navigating through layers of menus on the Internet.

The concept of a "cognitive orthotic" is becoming part of the lexicon. These devices, such as the Autominder software that uses artificial intelligence techniques to construct a daily schedule, observe whether the elder adheres to that schedule, and then chooses when it might be appropriate to issue a reminder.[45] It can also help people with mild cognitive impairment follow a routine (e.g., medications and personal hygiene), as well as periodic tasks, such as remembering doctor visits and important dates. From tasks as simple as hand washing and getting dressed, to more complex activities such as cooking a meal, research is showing that videos demonstrating basic activities can prompt persons with Alzheimer's disease to perform tasks correctly that they might otherwise not perform.[46] Such support is useful across the lifespan.

Research on gaming and "brain-fitness" is beginning to shed light on the potential benefits of specifically targeted games and activities. At older ages, these can be helpful in maintaining or improving certain cognitive abilities – such as delayed recall and digit reversal as shown in the IMPACT study,[47] improving visuospatial attention, expanding useful field of view[48] or even assisting in a post-stroke recovery.[49]

While practice can certainly improve game performance, the more important question is whether such practice transfers to real life activities. To date, no definitive evidence has emerged showing a clear link between games and performance in daily activities, though many individuals report more confidence in their memory abilities after engaging in brain training activities.[50]

Conclusion

Gerontechnology can help people cope more effectively with or compensate for physical and mental declines often associated with ageing. These technological developments can be simple and relatively low-tech, such as an assistive device like a foot orthotic that improves balance,[51] or highly advanced, such as socially assistive robots for rehabilitation[52] or robots for behavioural treatment of dementia symptoms.[53],[54]

Gerontechnology is expected to lead to more cost-effective care through the use of telehealth monitoring[55] and passive remote activity monitoring via algorithms that can potentially delay or prevent institutionalization, leading to significant savings for healthcare systems.[56] Interdisciplinary research teams, sometimes involving several universities, have organized a variety of research labs that bring together engineers, psychologists, gerontologists, physical and occupational therapists, experts in human factors design, and a wide range of medical and research faculty to develop innovative approaches to everyday issues.

Communication with caregivers and relatives can be enhanced with automated activity monitoring for at-risk people living alone[57] or through social networking[58],[59] or web-based social support groups.[60] Research on gaming and "brain-fitness" is beginning to reveal potential benefits of specifically targeted games.

Perhaps the most important, but currently overlooked, opportunity for gerontechnology lies in low- and middle-income countries. The following could all make a significant impact on the quality of life of millions of older people:

- Reinventing basic assistive devices to be more appropriate or more robust for a less developed environment
- Finding ways to strengthen the capacity of low- and middle-income countries to manufacture assistive devices
- Developing new technology that can cheaply ensure access to diagnostics or management of chronic conditions in remote areas

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Appendix Tables: Trends and Patterns in Population Ageing, by Country, Stage of Development and Region[1]

Sources

Data for all tables except Table 6 are derived from United Nations Population Division (2011), World Population Prospects: The 2010 Revision (United Nations, New York). http://esa.un.org/unpd/wpp

Data for Table 6 are from World Health Organization (2004), World Health Report 2004, Annex Table 4.

Data for the map are from World Bank (2011). World Development Indicators 2011 (World Bank, Washington).

Notes

"More developed regions" comprise Europe, North America, Australia/New Zealand, and Japan. "Less developed regions" comprise Africa, Asia (excluding Japan), Latin America and the Caribbean, Melanesia, Micronesia and Polynesia. This highly aggregated country classification dates from the 1960s and has been quite stable over time. It changed most notably after the breakup of the former Soviet Union in 1991, with Belarus, Estonia, Latvia, Lithuania, Moldova, Russia and Ukraine being grouped with the more developed regions (in Europe), and the other new countries becoming part of the less developed regions (in Asia). Before that, the USSR was included among the more developed regions (in Europe).

For geographical region definitions, see http://esa.un.org/unpd/wpp/Excel-Data/country-classification.pdf

The total fertility rate (TFR) is the average number of children that a woman would bear if she had children in accordance with current age-specific fertility rates.

Unless otherwise indicated, all population projections are the medium-fertility estimates of the UN Population Division. These projections depend critically on trajectories of future fertility, mortality and migration. The United Nations also makes low and high population projections, based on TFR trajectories that are 0.5 children below the medium and 0.5 children above the medium, respectively. Assumptions about migration are based on past estimates and the policies that countries have adopted. Projected levels of net migration incorporate a slow decline through 2100.

Life expectancy at birth is the average age at death for a defined birth cohort, assuming that it is subject to a given set of age-specific mortality rates, typically those prevailing in its year of birth. Estimates of future life expectancy are based on historical country- and sex-specific trends and a model that anticipates more rapid gains in countries with lower current life expectancy.

Healthy life expectancy at birth is defined by the World Health Organization as the "average number of years that a person can expect to live in 'full health' by taking into account years lived in less than full health due to disease and/or injury".

1 This Appendix was prepared by David Bloom, Larry Rosenberg and Adam Stein.

Table 1: Basic data on the population of older people, 2012

	Total population (millions)	%60+	%60-69	%70-79	%80+	60+ as % of 15-59	% female among 60+	% female among 80+
World	**7 052,1**	**11**	**6**	**4**	**2**	**18**	**54**	**62**
More developed regions	**1 244,6**	**22**	**11**	**7**	**4**	**37**	**57**	**66**
Less developed regions	**5 807,6**	**9**	**5**	**3**	**1**	**15**	**53**	**59**
Africa	**1 070,1**	**6**	**3**	**2**	**0**	**10**	**54**	**59**
Asia	**4 250,4**	**11**	**6**	**3**	**1**	**16**	**53**	**59**
Europe	**740,2**	**22**	**10**	**8**	**4**	**36**	**58**	**67**
Latin America & Caribbean	**603,2**	**10**	**0**	**3**	**2**	**17**	**55**	**61**
Northern America	**350,6**	**19**	**10**	**5**	**4**	**32**	**55**	**64**
Oceania	**37,7**	**16**	**8**	**5**	**3**	**26**	**53**	**60**
Afghanistan	33,4	4	3	1	0	7	50	55
Albania	3,2	14	7	5	2	21	52	61
Algeria	36,5	7	4	2	1	11	54	61
Angola	20,2	4	3	1	0	8	55	59
Argentina	41,1	15	8	5	3	25	58	68
Armenia	3,1	15	6	6	3	23	61	67
Aruba	0,1	15	9	5	2	23	56	63
Australia	22,9	20	10	6	4	32	53	60
Austria	8,4	24	11	8	5	38	56	67
Azerbaijan	9,4	9	4	3	1	13	57	63
Bahamas	0,4	11	7	3	1	17	57	69
Bahrain	1,4	4	3	1	0	5	44	52
Bangladesh	152,4	7	4	2	1	11	51	47
Barbados	0,3	17	9	5	3	26	57	67
Belarus	9,5	19	9	7	3	29	65	76
Belgium	10,8	24	11	8	5	40	56	65
Belize	0,3	6	3	2	1	10	52	56
Benin	9,4	5	3	1	0	9	59	65
Bhutan	0,8	7	4	2	1	11	48	53
Bolivia (Plurinational State of)	10,2	7	4	2	1	13	55	60
Bosnia and Herzegovina	3,7	20	10	7	3	31	56	64
Botswana	2,1	7	4	2	1	11	56	64
Brazil	198,4	11	6	3	2	17	55	60
Brunei Darussalam	0,4	6	4	2	1	9	47	54
Bulgaria	7,4	25	13	8	4	41	58	64
Burkina Faso	17,5	4	3	1	0	7	60	62
Burundi	8,7	5	3	1	0	8	59	64
Cambodia	14,5	7	4	2	0	10	61	70
Cameroon	20,5	5	3	2	0	10	54	58
Canada	34,7	21	11	6	4	33	54	62
Cape Verde	0,5	7	3	3	1	12	60	63
Central African Republic	4,6	6	4	2	1	11	56	60
Chad	11,8	5	3	1	0	9	54	60
Channel Islands	0,2	24	12	8	4	39	54	64
Chile	17,4	14	7	4	2	21	56	64
China	1 353,6	13	8	4	2	20	51	59
China, Hong Kong SAR	7,2	19	10	6	4	28	53	60
China, Macao SAR	0,6	12	8	3	2	17	48	64
Colombia	47,6	9	5	3	1	15	56	61
Comoros	0,8	4	3	1	0	8	54	60
Congo	4,2	6	3	2	1	10	54	57
Costa Rica	4,8	10	6	3	2	15	52	57
Côte d'Ivoire	20,6	6	4	2	0	11	46	50
Croatia	4,4	24	11	9	4	39	59	70
Cuba	11,2	18	9	6	3	27	53	58
Cyprus	1,1	17	9	5	3	26	54	60
Czech Republic	10,6	23	13	6	4	36	57	68
Dem. People's Republic of Korea	24,6	14	8	5	1	21	61	83

	Total population (millions)	%60+	%60-69	%70-79	%80+	60+ as % of 15-59	% female among 60+	% female among 80+
Democratic Republic of the Congo	69,6	4	3	1	0	8	55	61
Denmark	5,6	24	12	7	4	41	54	63
Djibouti	0,9	6	4	2	0	9	54	60
Dominican Republic	10,2	9	5	3	2	15	51	53
Ecuador	14,9	9	5	3	1	15	53	57
Egypt	84,0	8	5	2	1	14	54	59
El Salvador	6,3	10	5	3	2	16	57	59
Equatorial Guinea	0,7	5	3	1	0	8	47	56
Eritrea	5,6	4	3	1	0	8	61	70
Estonia	1,3	23	10	8	5	38	65	75
Ethiopia	86,5	5	3	2	0	10	53	57
Fiji	0,9	8	6	2	1	13	52	58
Finland	5,4	26	13	8	5	45	56	67
France	63,5	24	11	7	6	41	56	65
French Guiana	0,2	8	5	2	1	13	50	65
French Polynesia	0,3	10	6	3	1	15	51	57
Gabon	1,6	7	4	2	1	11	52	58
Gambia	1,8	4	2	1	0	7	48	48
Georgia	4,3	20	9	8	3	31	60	69
Germany	82,0	27	11	10	5	44	56	66
Ghana	25,5	6	4	2	1	11	51	55
Greece	11,4	25	11	9	5	41	55	59
Grenada	0,1	10	5	3	2	15	57	65
Guadeloupe	0,5	18	9	5	4	30	57	63
Guam	0,2	12	7	3	1	19	52	56
Guatemala	15,1	6	4	2	1	12	53	58
Guinea	10,5	5	3	2	0	10	54	59
Guinea-Bissau	1,6	6	4	2	0	10	54	59
Guyana	0,8	7	4	2	1	11	57	65
Haiti	10,3	7	4	2	1	12	54	58
Honduras	7,9	6	4	2	1	11	52	58
Hungary	9,9	23	12	8	4	38	61	70
Iceland	0,3	17	9	5	4	28	52	59
India	1 258,4	8	5	2	1	13	52	55
Indonesia	244,8	9	5	3	1	13	55	60
Iran (Islamic Republic of)	75,6	8	4	2	1	11	50	47
Iraq	33,7	5	3	2	0	9	58	71
Ireland	4,6	17	9	5	3	28	53	63
Israel	7,7	15	8	4	3	27	56	63
Italy	61,0	27	12	9	6	46	56	65
Jamaica	2,8	11	5	4	2	18	53	62
Japan	126,4	32	14	10	7	57	56	65
Jordan	6,5	6	3	2	1	10	49	49
Kazakhstan	16,4	10	6	4	1	16	64	79
Kenya	42,7	4	3	1	0	8	54	56
Kuwait	2,9	4	2	1	0	6	38	26
Kyrgyzstan	5,4	6	3	2	1	10	59	64
Lao People's Democratic Republic	6,4	6	4	2	1	10	55	60
Latvia	2,2	23	10	8	4	37	65	76
Lebanon	4,3	11	6	4	1	16	54	56
Lesotho	2,2	6	4	2	1	11	60	62
Liberia	4,2	4	3	1	0	8	55	60
Libyan Arab Jamahiriya	6,5	7	4	2	1	11	51	57
Lithuania	3,3	21	10	8	4	33	64	73
Luxembourg	0,5	19	9	6	4	30	55	66
Madagascar	21,9	5	3	1	0	9	53	52
Malawi	15,9	5	3	1	0	10	55	57
Malaysia	29,3	8	5	2	1	13	51	55
Maldives	0,3	7	3	3	1	10	47	41
Mali	16,3	3	2	1	0	7	59	59

	Total population (millions)	%60+	%60-69	%70-79	%80+	60+ as % of 15-59	% female among 60+	% female among 80+
Malta	0,4	23	12	7	3	36	55	64
Martinique	0,4	21	10	7	4	34	57	65
Mauritania	3,6	5	3	1	0	8	57	60
Mauritius	1,3	12	7	3	1	18	56	65
Mayotte	0,2	3	2	1	0	6	47	48
Mexico	116,1	10	5	3	1	15	54	60
Micronesia (Fed. States of)	0,1	6	4	2	1	11	53	59
Mongolia	2,8	6	3	2	1	9	57	65
Montenegro	0,6	18	9	6	3	29	56	61
Morocco	32,6	9	5	3	1	13	53	57
Mozambique	24,5	5	3	2	0	10	57	61
Myanmar	48,7	8	5	2	1	13	55	59
Namibia	2,4	6	4	2	1	10	57	61
Nepal	31,0	6	4	2	1	11	55	58
Netherlands	16,7	23	12	7	4	38	54	65
Netherlands Antilles	0,2	16	9	5	2	25	57	63
New Caledonia	0,3	12	7	4	2	20	52	62
New Zealand	4,5	19	10	6	4	31	53	60
Nicaragua	6,0	7	3	2	1	11	54	59
Niger	16,6	4	3	1	0	8	52	53
Nigeria	166,6	5	3	2	0	10	53	57
Norway	5,0	22	11	6	5	36	54	64
Occupied Palestinian Territory	4,3	4	3	1	0	8	51	60
Oman	2,9	5	3	1	0	7	42	53
Pakistan	180,0	7	4	2	1	11	49	48
Panama	3,6	10	6	3	1	16	52	56
Papua New Guinea	7,2	5	3	1	0	8	55	66
Paraguay	6,7	8	5	2	1	13	51	57
Peru	29,7	9	5	3	1	15	53	59
Philippines	96,5	6	4	2	0	10	56	63
Poland	38,3	20	10	6	4	32	60	70
Portugal	10,7	24	11	8	5	40	57	64
Puerto Rico	3,7	18	9	6	3	30	57	62
Qatar	1,9	2	1	1	0	3	29	45
Republic of Korea	48,6	17	9	6	2	25	57	70
Republic of Moldova	3,5	17	9	5	2	25	60	70
Réunion	0,9	12	6	4	2	20	55	60
Romania	21,4	21	10	7	3	33	59	66
Russian Federation	142,7	19	9	7	3	28	66	76
Rwanda	11,3	4	3	1	0	8	54	60
Saint Lucia	0,2	10	5	3	2	15	56	61
Saint Vincent and the Grenadines	0,1	10	5	3	1	15	54	61
Samoa	0,2	8	4	2	1	14	55	64
Sao Tome and Principe	0,2	5	3	2	1	9	57	58
Saudi Arabia	28,7	5	3	1	1	8	48	57
Senegal	13,1	4	3	1	0	7	53	52
Serbia	9,8	20	10	7	3	33	56	60
Sierra Leone	6,1	4	3	1	0	7	51	39
Singapore	5,3	15	9	4	2	23	53	59
Slovakia	5,5	18	10	5	3	27	60	70
Slovenia	2,0	23	11	8	4	38	58	72
Solomon Islands	0,6	5	3	1	0	9	52	54
Somalia	9,8	4	3	1	0	9	54	58
South Africa	50,7	8	5	2	1	12	59	71
Spain	46,8	23	10	7	5	37	56	63
Sri Lanka	21,2	13	7	4	2	21	54	56
Sudan	45,7	6	4	2	0	10	53	56
Suriname	0,5	10	5	3	1	15	56	63
Swaziland	1,2	5	3	2	0	9	57	64
Sweden	9,5	25	12	8	5	44	54	62

	Total population (millions)	%60+	%60-69	%70-79	%80+	60+ as % of 15-59	% female among 60+	% female among 80+
Switzerland	7,7	23	11	7	5	38	55	65
Syrian Arab Republic	21,1	6	4	2	1	11	51	55
Tajikistan	7,1	5	3	2	1	8	57	66
TFYR Macedonia	2,1	17	9	6	2	27	55	64
Thailand	69,9	14	8	4	2	21	55	60
Timor-Leste	1,2	5	3	1	0	10	53	57
Togo	6,3	5	3	2	0	10	54	58
Tonga	0,1	8	4	3	1	15	57	66
Trinidad and Tobago	1,4	11	7	3	1	16	59	71
Tunisia	10,7	10	6	3	1	16	52	53
Turkey	74,5	10	6	3	1	15	55	60
Turkmenistan	5,2	6	3	2	1	10	58	68
Uganda	35,6	4	2	1	0	8	55	58
Ukraine	44,9	21	10	8	3	33	65	74
United Arab Emirates	8,1	1	1	0	0	2	26	47
United Kingdom	62,8	23	11	7	5	39	54	63
United Republic of Tanzania	47,7	5	3	1	0	10	55	58
United States of America	315,8	19	10	5	4	31	56	64
United States Virgin Islands	0,1	23	13	7	3	39	55	65
Uruguay	3,4	19	9	6	4	31	59	67
Uzbekistan	28,1	6	3	2	1	10	56	65
Vanuatu	0,3	6	4	2	0	10	49	49
Venezuela (Bolivarian Republic of)	29,9	9	5	3	1	15	53	58
Viet Nam	89,7	9	5	3	1	13	57	62
Western Sahara	0,6	4	3	1	0	6	44	49
Yemen	25,6	4	3	1	0	8	54	58
Zambia	13,9	5	3	1	0	9	55	58
Zimbabwe	13,0	6	3	2	1	11	57	58

Table 2A: Percentage of population aged 60 and older

	1950	1970	1990	2010	2030	2050
World	**8**	**8**	**9**	**11**	**17**	**22**
More developed regions	**12**	**15**	**18**	**22**	**29**	**32**
Less developed regions	**6**	**6**	**7**	**9**	**14**	**20**
Africa	**5**	**5**	**5**	**5**	**7**	**10**
Asia	**7**	**6**	**8**	**10**	**17**	**24**
Europe	**12**	**15**	**18**	**22**	**29**	**34**
Latin America & Caribbean	**6**	**6**	**7**	**10**	**17**	**25**
Northern America	**12**	**14**	**17**	**19**	**26**	**27**
Oceania	**11**	**11**	**13**	**15**	**20**	**24**
Afghanistan	5	4	4	4	4	7
Albania	10	7	8	13	22	34
Algeria	7	6	5	7	14	26
Angola	5	5	4	4	5	8
Argentina	7	11	13	15	18	25
Armenia	12	8	10	15	23	30
Aruba	3	7	11	14	29	30
Australia	13	12	15	19	25	29
Austria	15	20	20	23	33	36
Azerbaijan	11	8	7	9	18	25
Bahamas	7	5	6	10	20	28
Bahrain	5	4	4	3	15	32
Bangladesh	6	5	6	7	12	22
Barbados	9	12	13	16	28	34
Belarus	13	13	17	18	25	32
Belgium	16	19	21	23	30	31
Belize	6	7	6	6	11	18
Benin	11	7	5	5	6	8
Bhutan	4	4	5	7	12	24
Bolivia (Plurinational State of)	6	6	6	7	10	15
Bosnia and Herzegovina	6	8	10	19	30	40
Botswana	7	5	4	6	8	13
Brazil	5	6	7	10	19	29
Brunei Darussalam	8	6	4	6	14	23
Bulgaria	10	15	19	24	29	36
Burkina Faso	4	4	4	4	4	7
Burundi	5	5	5	5	7	12
Cambodia	5	5	5	6	11	19
Cameroon	6	6	6	5	6	9
Canada	11	11	16	20	29	31
Cape Verde	10	7	7	7	13	23
Central African Republic	8	7	6	6	6	10
Chad	7	6	5	5	5	7
Channel Islands	17	20	20	23	34	36
Chile	7	8	9	13	23	30
China	8	7	9	12	24	34
China, Hong Kong SAR	4	6	13	18	33	37
China, Macao SAR	5	9	10	12	26	38
Colombia	5	5	6	9	16	24
Comoros	6	5	5	4	6	9
Congo	6	6	6	6	6	9
Costa Rica	8	7	7	10	19	30
Côte d'Ivoire	4	4	4	6	6	10
Croatia	11	15	17	23	30	34
Cuba	7	9	12	17	32	39
Cyprus	9	14	14	16	23	32
Czech Republic	12	18	18	22	28	34
Dem. People's Republic of Korea	4	2	8	14	19	23
Democratic Republic of the Congo	6	5	4	4	5	7
Denmark	13	18	20	23	29	30

	1950	1970	1990	2010	2030	2050
Djibouti	3	4	4	5	8	12
Dominican Republic	4	4	6	9	15	22
Ecuador	8	6	6	9	15	24
Egypt	5	5	6	8	13	20
El Salvador	6	6	7	10	13	21
Equatorial Guinea	9	7	7	4	9	9
Eritrea	5	4	4	4	5	10
Estonia	15	17	17	23	27	32
Ethiopia	5	5	5	5	7	12
Fiji	4	4	5	8	15	20
Finland	10	14	18	25	31	31
France	16	18	19	23	29	30
French Guiana	9	7	6	7	13	16
French Polynesia	4	4	5	9	18	27
Gabon	11	11	8	6	9	13
Gambia	5	4	4	3	5	8
Georgia	15	12	15	19	28	35
Germany	15	20	20	26	36	37
Ghana	4	4	5	6	8	12
Greece	10	16	20	24	31	36
Grenada	8	8	11	10	15	29
Guadeloupe	7	7	11	17	28	33
Guam	2	3	7	11	19	22
Guatemala	4	5	5	6	8	12
Guinea	8	5	5	5	6	8
Guinea-Bissau	6	6	6	5	6	8
Guyana	6	5	7	6	15	22
Haiti	6	6	6	7	9	15
Honduras	6	5	5	6	10	17
Hungary	12	17	19	23	27	32
Iceland	10	12	15	17	24	29
India	5	5	6	8	12	19
Indonesia	6	5	6	8	16	25
Iran (Islamic Republic of)	8	5	6	7	15	33
Iraq	5	7	6	5	6	10
Ireland	15	16	15	16	23	29
Israel	6	10	12	15	19	23
Italy	12	16	21	27	34	38
Jamaica	6	8	10	11	19	26
Japan	8	11	17	30	37	41
Jordan	7	5	5	6	9	18
Kazakhstan	10	8	10	10	15	20
Kenya	6	5	4	4	5	9
Kuwait	4	3	3	4	10	22
Kyrgyzstan	12	9	8	6	11	17
Lao People's Democratic Republic	4	5	6	6	10	19
Latvia	16	17	17	23	27	34
Lebanon	10	7	8	10	17	28
Lesotho	7	7	6	6	6	9
Liberia	5	4	4	4	5	8
Libyan Arab Jamahiriya	7	4	4	6	12	23
Lithuania	13	15	16	21	27	32
Luxembourg	15	18	19	19	25	30
Madagascar	5	6	5	5	7	9
Malawi	5	4	4	5	4	5
Malaysia	7	5	6	8	15	20
Maldives	5	4	5	7	14	31
Mali	5	5	5	4	4	6
Malta	9	13	14	21	30	37
Martinique	8	8	13	20	32	37
Mauritania	3	4	4	4	6	10
Mauritius	5	4	7	11	22	29

	1950	1970	1990	2010	2030	2050
Mayotte	15	8	4	3	7	12
Mexico	5	6	6	9	17	26
Micronesia (Fed. States of)	6	5	5	6	10	15
Mongolia	7	8	6	6	12	20
Montenegro	10	11	13	18	24	31
Morocco	5	6	6	8	15	24
Mozambique	5	5	5	5	6	7
Myanmar	6	6	7	8	15	25
Namibia	7	6	5	6	9	13
Nepal	4	5	5	6	9	17
Netherlands	11	14	17	22	31	32
Netherlands Antilles	9	8	10	15	28	39
New Caledonia	6	6	7	12	19	26
New Zealand	13	12	15	18	26	29
Nicaragua	5	4	5	6	11	21
Niger	2	3	4	4	4	5
Nigeria	5	5	5	5	5	7
Norway	14	18	21	21	27	29
Occupied Palestinian Territory	7	4	3	4	6	10
Oman	5	5	3	4	14	29
Pakistan	8	6	6	6	9	16
Panama	6	6	7	10	16	23
Papua New Guinea	6	4	4	5	7	11
Paraguay	5	5	6	8	11	17
Peru	6	6	6	9	14	23
Philippines	6	5	5	6	10	15
Poland	8	13	15	19	27	35
Portugal	10	14	19	24	33	40
Puerto Rico	6	10	13	18	25	31
Qatar	6	3	2	2	9	28
Republic of Korea	5	5	8	16	31	39
Republic of Moldova	11	10	13	16	24	34
Réunion	6	5	8	12	21	26
Romania	9	13	16	20	27	36
Russian Federation	9	12	16	18	25	31
Rwanda	5	4	4	4	5	9
Saint Lucia	6	7	10	9	17	28
Saint Vincent and the Grenadines	6	8	9	10	18	24
Samoa	4	3	6	7	12	13
Sao Tome and Principe	6	7	7	5	6	13
Saudi Arabia	6	5	4	4	9	22
Senegal	5	4	4	4	5	8
Serbia	11	13	15	20	25	32
Sierra Leone	5	5	5	4	5	7
Singapore	4	6	8	14	31	38
Slovakia	10	14	15	17	26	35
Slovenia	11	15	16	22	32	37
Solomon Islands	3	5	4	5	7	12
Somalia	5	5	5	4	5	6
South Africa	6	6	5	7	11	15
Spain	11	14	19	22	31	38
Sri Lanka	12	6	8	12	20	27
Sudan	5	5	5	6	7	11
Suriname	8	6	7	9	16	24
Swaziland	5	4	4	5	6	8
Sweden	15	20	23	25	29	31
Switzerland	14	16	19	23	32	37
Syrian Arab Republic	7	6	5	6	11	18
Tajikistan	7	7	6	5	9	14
TFYR Macedonia	11	9	11	17	25	34
Thailand	5	5	7	13	24	32
Timor-Leste	6	4	3	5	5	7
Togo	7	5	5	5	7	12
Tonga	3	4	7	8	10	13
Trinidad and Tobago	6	7	8	11	21	32
Tunisia	8	6	7	10	17	29
Turkey	5	6	6	9	16	26
Turkmenistan	10	7	6	6	12	20
Uganda	5	4	4	4	4	6
Ukraine	11	14	19	21	25	32
United Arab Emirates	6	2	2	1	12	36
United Kingdom	16	19	21	23	27	30
United Republic of Tanzania	4	4	4	5	5	6
United States of America	13	14	17	18	25	27
United States Virgin Islands	11	6	9	21	32	30
Uruguay	12	13	17	18	22	27
Uzbekistan	9	9	6	6	12	21
Vanuatu	4	5	5	5	8	13
Venezuela (Bolivarian Republic of)	3	5	6	9	15	22
Viet Nam	7	7	7	8	18	31
Western Sahara	5	4	4	4	12	23
Yemen	6	5	3	4	5	9
Zambia	4	4	4	5	4	4
Zimbabwe	5	5	5	6	5	12

Table 2B: Percentage of population aged 80 and older

	1950	1970	1990	2010	2030	2050
World	**1**	**1**	**1**	**2**	**2**	**4**
More developed regions	**1**	**2**	**3**	**4**	**6**	**9**
Less developed regions	**0**	**0**	**1**	**1**	**2**	**4**
Africa	**0**	**0**	**0**	**0**	**1**	**1**
Asia	**0**	**0**	**1**	**1**	**2**	**5**
Europe	**1**	**2**	**3**	**4**	**6**	**9**
Latin America & Caribbean	**0**	**0**	**1**	**1**	**3**	**6**
Northern America	**1**	**2**	**3**	**4**	**5**	**8**
Oceania	**1**	**1**	**2**	**3**	**4**	**6**
Afghanistan	0	0	0	0	0	0
Albania	1	1	1	2	3	7
Algeria	0	1	1	1	1	4
Angola	0	0	0	0	0	1
Argentina	0	1	1	3	3	5
Armenia	1	1	1	3	3	7
Aruba	0	0	2	1	3	9
Australia	1	1	2	4	6	8
Austria	1	2	4	5	7	12
Azerbaijan	1	1	1	1	1	4
Bahamas	1	0	1	1	3	6
Bahrain	0	0	0	0	1	4
Bangladesh	0	0	0	1	1	3
Barbados	1	1	2	3	4	9
Belarus	1	2	2	3	4	6
Belgium	1	2	4	5	6	10
Belize	0	1	1	1	1	3
Benin	1	0	0	0	0	1
Bhutan	0	0	0	1	1	3
Bolivia (Plurinational State of)	0	0	0	1	1	2
Bosnia and Herzegovina	1	1	1	3	5	10
Botswana	0	0	0	0	1	1
Brazil	0	0	1	1	3	7
Brunei Darussalam	1	0	1	1	2	5
Bulgaria	1	1	2	4	5	8
Burkina Faso	0	0	0	0	0	0
Burundi	0	0	0	0	0	1
Cambodia	0	0	0	0	1	2
Cameroon	0	0	0	0	1	1
Canada	1	2	2	4	6	10
Cape Verde	1	1	1	1	1	4
Central African Republic	0	0	0	0	1	1
Chad	0	0	0	0	0	0
Channel Islands	2	3	3	4	7	12
Chile	0	1	1	2	4	8
China	0	0	1	1	3	8
China, Hong Kong SAR	0	0	1	4	6	13
China, Macao SAR	0	1	1	2	3	10
Colombia	0	0	1	1	2	5
Comoros	0	0	0	0	0	1
Congo	0	0	0	1	1	1
Costa Rica	1	1	1	1	3	7
Côte d'Ivoire	0	0	0	0	1	1
Croatia	1	1	2	4	6	9
Cuba	1	1	2	3	6	13
Cyprus	1	2	2	3	4	7
Czech Republic	1	1	2	4	6	8
Dem. People's Republic of Korea	0	0	0	1	2	4
Democratic Republic of the Congo	1	0	0	0	0	1
Denmark	1	2	4	4	7	9

	1950	1970	1990	2010	2030	2050
Djibouti	0	0	0	0	1	1
Dominican Republic	0	0	1	1	2	5
Ecuador	1	1	1	1	2	5
Egypt	0	0	0	1	1	3
El Salvador	0	1	1	2	3	4
Equatorial Guinea	0	0	1	0	0	1
Eritrea	0	0	0	0	0	1
Estonia	2	2	3	4	6	8
Ethiopia	0	0	0	0	1	1
Fiji	0	0	0	0	1	4
Finland	1	1	3	5	8	10
France	2	2	4	5	7	10
French Guiana	1	1	1	1	1	3
French Polynesia	0	0	0	1	2	6
Gabon	1	1	1	1	1	2
Gambia	0	0	0	0	0	0
Georgia	1	2	2	3	4	8
Germany	1	2	4	5	8	13
Ghana	0	0	0	0	1	1
Greece	1	2	3	5	7	10
Grenada	1	1	1	2	2	5
Guadeloupe	0	1	2	3	6	11
Guam	0	0	0	1	2	5
Guatemala	0	0	1	1	1	2
Guinea	0	0	0	0	0	1
Guinea-Bissau	0	0	0	0	0	1
Guyana	1	0	1	1	1	5
Haiti	1	0	0	0	1	2
Honduras	1	0	0	1	1	3
Hungary	1	1	3	4	5	7
Iceland	1	2	3	3	5	8
India	0	0	0	1	1	3
Indonesia	0	0	0	1	2	5
Iran (Islamic Republic of)	1	0	0	1	1	5
Iraq	0	0	0	0	0	1
Ireland	2	2	2	3	5	7
Israel	0	1	2	3	4	6
Italy	1	2	3	6	8	13
Jamaica	0	1	2	2	3	7
Japan	0	1	2	6	13	15
Jordan	0	1	1	0	1	2
Kazakhstan	1	1	1	1	1	3
Kenya	0	0	0	0	0	1
Kuwait	0	0	0	0	0	2
Kyrgyzstan	1	1	1	1	1	2
Lao People's Democratic Republic	0	0	0	1	1	2
Latvia	2	2	3	4	5	8
Lebanon	1	1	1	1	2	5
Lesotho	0	0	0	1	1	1
Liberia	0	0	0	0	0	1
Libyan Arab Jamahiriya	0	0	0	1	1	3
Lithuania	2	2	3	4	5	8
Luxembourg	1	2	3	4	5	8
Madagascar	0	0	0	0	1	1
Malawi	0	0	0	0	0	0
Malaysia	1	0	0	1	1	3
Maldives	0	0	0	1	2	5
Mali	0	0	0	0	0	0
Malta	1	1	2	3	7	9
Martinique	1	1	2	4	7	13
Mauritania	0	0	0	0	0	1
Mauritius	0	0	1	1	3	7

	1950	1970	1990	2010	2030	2050
Mayotte	6	1	1	0	1	2
Mexico	1	1	1	1	2	6
Micronesia (Fed. States of)	1	0	0	1	1	2
Mongolia	0	1	1	1	1	3
Montenegro	1	2	2	2	4	6
Morocco	0	1	0	1	1	4
Mozambique	0	0	0	0	1	1
Myanmar	0	0	0	1	1	3
Namibia	0	0	0	1	1	2
Nepal	0	0	0	0	1	2
Netherlands	1	2	3	4	7	11
Netherlands Antilles	1	1	2	2	4	10
New Caledonia	0	0	1	2	3	6
New Zealand	1	2	2	3	5	9
Nicaragua	0	0	0	1	2	4
Niger	0	0	0	0	0	0
Nigeria	0	0	0	0	0	1
Norway	2	2	4	5	6	9
Occupied Palestinian Territory	0	0	0	0	1	1
Oman	0	0	0	1	1	4
Pakistan	1	1	0	1	1	2
Panama	0	1	1	1	2	5
Papua New Guinea	0	0	0	0	1	1
Paraguay	0	0	1	1	2	3
Peru	0	0	1	1	2	4
Philippines	0	0	0	0	1	2
Poland	1	1	2	3	5	8
Portugal	1	2	3	5	7	12
Puerto Rico	0	1	2	3	5	9
Qatar	0	0	0	0	0	4
Republic of Korea	0	0	1	2	5	12
Republic of Moldova	1	1	1	2	3	6
Réunion	0	1	1	2	3	7
Romania	1	1	2	3	4	8
Russian Federation	1	1	2	3	4	6
Rwanda	0	0	0	0	0	1
Saint Lucia	1	0	1	2	2	6
Saint Vincent and the Grenadines	1	1	1	1	2	4
Samoa	0	0	0	1	1	3
Sao Tome and Principe	1	1	1	1	1	1
Saudi Arabia	0	0	1	1	1	2
Senegal	0	0	0	0	0	0
Serbia	1	1	2	3	4	6
Sierra Leone	0	0	0	0	0	0
Singapore	0	0	1	2	5	13
Slovakia	1	1	2	3	4	7
Slovenia	1	1	2	4	6	10
Solomon Islands	0	0	0	0	1	1
Somalia	0	0	0	0	0	1
South Africa	0	0	0	1	1	2
Spain	1	2	3	5	7	12
Sri Lanka	2	1	1	1	3	6
Sudan	0	0	0	0	1	1
Suriname	1	1	1	1	2	5
Swaziland	0	0	0	0	1	1
Sweden	2	2	4	5	8	10
Switzerland	1	2	4	5	8	13
Syrian Arab Republic	0	1	1	1	1	3
Tajikistan	0	1	1	1	1	2
TFYR Macedonia	1	1	1	2	4	7
Thailand	0	0	1	2	3	8
Timor-Leste	0	0	0	0	0	1

	1950	1970	1990	2010	2030	2050
Togo	0	0	0	0	1	1
Tonga	0	0	1	1	1	2
Trinidad and Tobago	0	1	1	1	3	6
Tunisia	1	0	1	1	2	5
Turkey	0	0	0	1	2	4
Turkmenistan	1	1	1	1	1	3
Uganda	0	0	0	0	0	0
Ukraine	1	1	2	3	4	6
United Arab Emirates	0	0	0	0	0	4
United Kingdom	1	2	4	5	6	9
United Republic of Tanzania	0	0	0	0	1	1
United States of America	1	2	3	4	5	8
United States Virgin Islands	1	1	1	3	8	11
Uruguay	1	1	2	4	5	7
Uzbekistan	1	1	1	1	1	3
Vanuatu	0	0	1	0	1	2
Venezuela (Bolivarian Republic of)	0	0	1	1	2	4
Viet Nam	0	0	1	1	2	6
Western Sahara	0	0	0	0	1	3
Yemen	0	0	0	0	0	1
Zambia	0	0	0	0	0	0
Zimbabwe	0	0	0	1	1	1

Table 3A: Average annual growth rate of total population (percent)

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
World	**1,9**	**1,8**	**1,3**	**0,9**	**0,6**
More developed regions	**1,1**	**0,6**	**0,4**	**0,2**	**0,1**
Less developed regions	**2,2**	**2,2**	**1,5**	**1,1**	**0,6**
Africa	**2,4**	**2,7**	**2,4**	**2,1**	**1,7**
Asia	**2,1**	**2,0**	**1,3**	**0,8**	**0,3**
Europe	**0,9**	**0,5**	**0,1**	**0,0**	**-0,2**
Latin America & Caribbean	**2,7**	**2,2**	**1,4**	**0,9**	**0,3**
Northern America	**1,5**	**1,0**	**1,0**	**0,8**	**0,5**
Oceania	**2,2**	**1,6**	**1,5**	**1,3**	**0,8**
Afghanistan	1,9	0,4	4,4	2,6	1,8
Albania	2,8	2,2	-0,1	0,1	-0,5
Algeria	2,3	3,1	1,7	1,0	0,3
Angola	1,8	2,8	3,1	2,4	1,6
Argentina	1,7	1,5	1,1	0,7	0,4
Armenia	3,1	1,7	-0,7	0,0	-0,3
Aruba	2,2	0,3	2,7	0,2	-0,4
Australia	2,2	1,5	1,3	1,1	0,6
Austria	0,4	0,1	0,5	0,1	-0,1
Azerbaijan	2,9	1,7	1,2	0,8	0,3
Bahamas	3,8	2,1	1,5	1,0	0,4
Bahrain	3,0	4,2	4,7	1,4	0,4
Bangladesh	2,8	2,3	1,7	1,0	0,3
Barbados	0,6	0,4	0,3	0,1	-0,3
Belarus	0,8	0,6	-0,3	-0,4	-0,5
Belgium	0,5	0,2	0,4	0,2	0,2
Belize	2,9	2,2	2,5	1,7	0,9
Benin	1,2	2,6	3,1	2,5	2,0
Bhutan	2,9	3,1	1,3	1,1	0,3
Bolivia (Plurinational State of)	2,2	2,3	2,0	1,5	1,1
Bosnia and Herzegovina	1,5	0,9	-0,7	-0,4	-0,8
Botswana	2,6	3,5	1,9	0,8	0,3
Brazil	2,9	2,2	1,3	0,6	0,1
Brunei Darussalam	4,8	3,5	2,3	1,3	0,7
Bulgaria	0,8	0,2	-0,8	-0,7	-0,8
Burkina Faso	1,5	2,4	2,8	2,8	2,4
Burundi	1,8	2,3	2,0	1,6	0,9
Cambodia	2,3	1,6	2,0	1,0	0,4
Cameroon	2,1	2,9	2,4	1,9	1,4
Canada	2,3	1,2	1,0	0,8	0,5
Cape Verde	2,2	1,2	1,8	0,9	0,4
Central African Republic	1,6	2,4	2,0	1,8	1,4
Chad	2,0	2,5	3,1	2,5	2,0
Channel Islands	0,8	0,7	0,5	0,1	-0,2
Chile	2,3	1,6	1,3	0,7	0,1
China	2,0	1,7	0,8	0,2	-0,4
China, Hong Kong SAR	3,5	1,9	1,0	0,9	0,5
China, Macao SAR	1,2	1,8	2,1	1,6	0,5
Colombia	2,9	2,2	1,7	1,0	0,4
Comoros	2,1	3,0	2,6	2,3	1,9
Congo	2,5	2,9	2,6	2,1	1,8
Costa Rica	3,2	2,6	2,1	1,0	0,3
Côte d'Ivoire	3,6	4,2	2,3	2,1	1,6
Croatia	0,4	0,4	-0,1	-0,3	-0,4
Cuba	1,9	1,0	0,3	-0,1	-0,5
Cyprus	1,1	1,1	1,8	0,8	0,2
Czech Republic	0,5	0,3	0,1	0,1	-0,1
Dem. People's Republic of Korea	1,9	1,7	0,9	0,4	0,0
Democratic Republic of the Congo	2,5	2,9	3,0	2,4	1,7

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Denmark	0,7	0,2	0,4	0,3	0,0
Djibouti	4,8	6,2	2,3	1,8	1,2
Dominican Republic	3,2	2,3	1,6	1,0	0,4
Ecuador	2,8	2,7	1,7	1,1	0,4
Egypt	2,6	2,3	1,8	1,4	0,7
El Salvador	2,6	1,8	0,7	0,7	0,4
Equatorial Guinea	1,3	1,3	3,1	2,3	1,5
Eritrea	2,4	2,7	2,5	2,3	1,6
Estonia	1,1	0,7	-0,8	-0,2	-0,3
Ethiopia	2,3	2,6	2,7	1,8	1,0
Fiji	2,9	1,7	0,8	0,5	0,3
Finland	0,7	0,4	0,4	0,2	0,0
France	1,0	0,6	0,5	0,4	0,3
French Guiana	3,2	4,4	3,4	2,3	1,6
French Polynesia	3,0	2,8	1,6	0,8	0,2
Gabon	0,6	2,8	2,4	1,8	1,3
Gambia	2,6	3,7	2,9	2,4	1,8
Georgia	1,4	0,7	-1,1	-0,7	-0,8
Germany	0,7	0,1	0,2	-0,2	-0,3
Ghana	2,8	2,7	2,5	2,0	1,5
Greece	0,8	0,7	0,6	0,1	0,0
Grenada	1,0	0,1	0,4	0,1	-0,6
Guadeloupe	2,1	0,9	0,9	0,3	-0,1
Guam	1,8	2,2	1,5	1,0	0,5
Guatemala	2,7	2,5	2,4	2,3	1,6
Guinea	1,5	1,6	2,7	2,3	1,8
Guinea-Bissau	0,8	2,6	2,0	2,0	1,7
Guyana	2,9	0,0	0,2	0,3	-0,2
Haiti	1,9	2,1	1,7	1,1	0,6
Honduras	3,0	3,0	2,2	1,7	1,0
Hungary	0,5	0,0	-0,2	-0,2	-0,2
Iceland	1,8	1,1	1,1	1,0	0,5
India	2,0	2,3	1,7	1,1	0,5
Indonesia	2,3	2,2	1,3	0,8	0,2
Iran (Islamic Republic of)	2,5	3,2	1,5	0,7	0,1
Iraq	2,8	2,8	3,0	2,8	2,1
Ireland	0,1	0,9	1,2	0,9	0,6
Israel	4,1	2,3	2,5	1,4	1,0
Italy	0,7	0,3	0,3	0,0	-0,1
Jamaica	1,4	1,2	0,7	0,2	-0,5
Japan	1,2	0,8	0,2	-0,3	-0,5
Jordan	6,6	3,6	3,0	1,5	0,8
Kazakhstan	3,4	1,2	-0,2	0,8	0,6
Kenya	3,1	3,7	2,7	2,4	1,9
Kuwait	8,0	5,1	1,4	1,9	1,3
Kyrgyzstan	2,7	2,0	1,0	1,1	0,8
Lao People's Democratic Republic	2,3	2,2	2,0	1,1	0,4
Latvia	1,0	0,6	-0,8	-0,4	-0,4
Lebanon	2,7	0,9	1,8	0,5	0,0
Lesotho	1,7	2,3	1,4	0,8	0,4
Liberia	2,3	2,0	3,2	2,5	2,0
Libyan Arab Jamahiriya	3,3	3,9	1,9	1,0	0,6
Lithuania	1,0	0,8	-0,5	-0,4	-0,4
Luxembourg	0,7	0,6	1,4	1,1	0,5
Madagascar	2,4	2,7	3,0	2,7	2,1
Malawi	2,3	3,6	2,3	3,2	2,8
Malaysia	2,9	2,6	2,2	1,4	0,8
Maldives	2,3	3,2	1,8	1,0	0,3
Mali	1,3	1,8	2,9	2,8	2,3
Malta	-0,1	1,0	0,6	0,2	-0,2
Martinique	1,9	0,5	0,6	0,1	-0,4

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Mauritania	2,7	2,8	2,8	2,0	1,5
Mauritius	2,6	1,2	1,0	0,4	-0,1
Mayotte	4,4	4,6	4,0	2,6	1,8
Mexico	3,1	2,4	1,5	0,9	0,3
Micronesia (Fed. States of)	3,3	2,2	0,7	0,7	0,4
Mongolia	2,5	2,7	1,1	1,2	0,7
Montenegro	1,3	0,8	0,2	0,0	-0,2
Morocco	2,7	2,4	1,3	0,8	0,2
Mozambique	1,9	1,8	2,7	2,1	1,7
Myanmar	2,1	2,0	1,0	0,6	0,1
Namibia	2,4	3,0	2,4	1,4	0,8
Nepal	1,9	2,4	2,3	1,4	0,8
Netherlands	1,3	0,7	0,5	0,2	0,0
Netherlands Antilles	1,8	0,9	0,3	0,3	-0,4
New Caledonia	2,4	2,4	2,0	1,1	0,4
New Zealand	2,0	0,9	1,3	0,9	0,4
Nicaragua	3,1	2,7	1,7	1,1	0,4
Niger	2,9	2,9	3,4	3,4	2,9
Nigeria	2,1	2,7	2,4	2,4	2,1
Norway	0,9	0,4	0,7	0,7	0,4
Occupied Palestinian Territory	0,9	3,1	3,3	2,6	1,8
Oman	2,4	4,7	2,0	1,3	0,2
Pakistan	2,3	3,2	2,2	1,5	0,8
Panama	2,8	2,4	1,9	1,2	0,7
Papua New Guinea	1,8	2,7	2,5	2,0	1,4
Paraguay	2,6	2,7	2,1	1,5	0,9
Peru	2,7	2,5	1,5	1,0	0,4
Philippines	3,3	2,8	2,1	1,5	1,0
Poland	1,4	0,8	0,0	-0,1	-0,4
Portugal	0,2	0,7	0,4	-0,2	-0,5
Puerto Rico	1,0	1,3	0,3	0,0	-0,1
Qatar	7,3	7,4	6,6	1,5	0,5
Republic of Korea	2,5	1,6	0,6	0,2	-0,3
Republic of Moldova	2,1	1,0	-1,0	-0,6	-0,8
Réunion	3,1	1,4	1,6	0,9	0,4
Romania	1,1	0,7	-0,4	-0,3	-0,5
Russian Federation	1,2	0,6	-0,2	-0,2	-0,4
Rwanda	3,0	3,2	2,0	2,5	2,0
Saint Lucia	1,1	1,4	1,2	0,7	0,1
Saint Vincent and the Grenadines	1,5	0,9	0,1	0,1	0,1
Samoa	2,8	0,6	0,6	0,5	0,4
Sao Tome and Principe	1,0	2,3	1,8	1,7	1,2
Saudi Arabia	3,1	5,1	2,7	1,7	0,8
Senegal	2,6	2,8	2,7	2,4	1,8
Serbia	1,0	0,8	0,1	-0,2	-0,4
Sierra Leone	1,6	2,1	1,9	1,9	1,3
Singapore	3,5	1,9	2,6	0,8	0,1
Slovakia	1,4	0,8	0,2	0,1	-0,3
Slovenia	0,6	0,7	0,3	0,1	-0,2
Solomon Islands	2,9	3,3	2,8	2,2	1,6
Somalia	2,3	3,0	1,7	2,8	2,7
South Africa	2,5	2,5	1,5	0,4	0,2
Spain	0,9	0,7	0,8	0,4	0,1
Sri Lanka	2,1	1,6	0,9	0,5	0,0
Sudan	2,4	2,9	2,5	2,1	1,5
Suriname	2,7	0,4	1,3	0,7	0,1
Swaziland	2,5	3,3	1,6	1,0	0,7
Sweden	0,7	0,3	0,5	0,5	0,3
Switzerland	1,4	0,4	0,7	0,3	-0,1
Syrian Arab Republic	3,1	3,3	2,5	1,6	0,9
Tajikistan	3,3	2,9	1,3	1,4	0,9
TFYR Macedonia	1,2	1,0	0,4	0,0	-0,4
Thailand	2,9	2,2	1,0	0,3	-0,2
Timor-Leste	1,7	1,0	2,1	2,9	2,1
Togo	2,0	2,8	2,5	1,8	1,2
Tonga	2,9	0,6	0,4	0,7	0,7
Trinidad and Tobago	2,1	1,1	0,5	0,0	-0,2
Tunisia	1,9	2,4	1,2	0,8	0,2
Turkey	2,6	2,1	1,5	0,9	0,3
Turkmenistan	3,0	2,6	1,6	1,0	0,4
Uganda	3,0	3,1	3,2	2,9	2,3
Ukraine	1,2	0,4	-0,6	-0,6	-0,6
United Arab Emirates	6,0	10,3	7,1	1,7	0,7
United Kingdom	0,5	0,1	0,4	0,6	0,2
United Republic of Tanzania	2,9	3,1	2,8	3,0	2,6
United States of America	1,4	1,0	1,0	0,8	0,5
United States Virgin Islands	4,4	2,4	0,3	-0,3	-0,5
Uruguay	1,1	0,5	0,4	0,3	0,1
Uzbekistan	3,2	2,7	1,5	1,0	0,3
Vanuatu	2,9	2,7	2,5	2,2	1,6
Venezuela (Bolivarian Republic of)	3,7	3,1	1,9	1,2	0,6
Viet Nam	2,3	2,0	1,3	0,7	0,1
Western Sahara	8,6	5,3	4,4	2,1	0,6
Yemen	1,8	3,3	3,5	2,7	2,0
Zambia	2,9	3,2	2,5	3,1	3,0
Zimbabwe	3,2	3,5	0,9	1,7	0,8

Table 3B: Average annual growth rate of population aged 60 and older (percent)

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
World	**2,0**	**2,3**	**2,2**	**3,0**	**1,9**
More developed regions	**2,2**	**1,6**	**1,4**	**1,6**	**0,6**
Less developed regions	**1,9**	**2,9**	**2,7**	**3,6**	**2,3**
Africa	**2,1**	**2,7**	**2,9**	**3,2**	**3,5**
Asia	**1,8**	**3,0**	**2,7**	**3,5**	**2,1**
Europe	**2,1**	**1,3**	**1,0**	**1,4**	**0,6**
Latin America & Caribbean	**3,3**	**3,0**	**3,0**	**3,5**	**2,3**
Northern America	**2,0**	**1,9**	**1,6**	**2,4**	**0,8**
Oceania	**1,9**	**2,6**	**2,4**	**2,6**	**1,6**
Afghanistan	1,4	0,1	4,3	3,4	4,0
Albania	0,7	3,0	2,5	2,8	1,6
Algeria	1,8	2,3	2,8	4,5	3,6
Angola	1,3	2,4	2,7	3,6	3,8
Argentina	3,8	2,5	1,7	1,8	2,0
Armenia	1,2	2,6	1,2	2,2	1,1
Aruba	6,5	2,3	4,3	3,7	-0,2
Australia	2,1	2,6	2,3	2,5	1,4
Austria	1,7	0,2	1,1	1,9	0,4
Azerbaijan	1,3	1,2	2,1	4,4	2,0
Bahamas	2,8	2,9	3,9	4,3	1,9
Bahrain	2,8	3,4	4,2	8,8	4,2
Bangladesh	2,5	2,5	2,5	3,9	3,5
Barbados	2,4	0,9	1,2	2,8	0,6
Belarus	1,0	1,8	0,2	1,2	0,7
Belgium	1,4	0,6	1,0	1,5	0,3
Belize	3,3	1,6	2,3	5,0	3,6
Benin	-1,0	0,9	2,6	3,5	3,8
Bhutan	3,0	4,2	2,6	3,6	4,0
Bolivia (Plurinational State of)	2,3	2,5	2,8	3,2	3,1
Bosnia and Herzegovina	2,7	2,5	2,4	1,9	0,6
Botswana	0,6	2,8	3,9	2,3	2,6
Brazil	3,6	3,2	3,3	3,7	2,2
Brunei Darussalam	3,6	1,9	3,7	5,9	3,2
Bulgaria	2,6	1,5	0,4	0,1	0,3
Burkina Faso	2,3	2,2	2,1	3,8	4,4
Burundi	1,9	1,8	1,7	3,4	4,1
Cambodia	2,4	1,5	3,6	3,8	3,2
Cameroon	2,2	2,6	2,3	2,6	3,6
Canada	2,3	2,8	2,3	2,7	0,8
Cape Verde	0,3	1,3	1,6	3,9	3,3
Central African Republic	0,7	2,1	1,8	1,8	3,9
Chad	1,5	1,9	2,2	2,8	3,8
Channel Islands	1,6	0,7	1,3	2,0	0,1
Chile	2,9	2,3	3,2	3,5	1,5
China	1,3	3,2	2,4	3,6	1,3
China, Hong Kong SAR	6,2	5,4	2,8	3,8	1,1
China, Macao SAR	4,8	2,1	2,8	5,7	2,4
Colombia	3,1	2,9	3,2	4,3	2,3
Comoros	1,3	2,7	2,0	4,0	3,8
Congo	2,7	2,7	2,5	2,9	3,5
Costa Rica	2,7	2,8	3,5	4,5	2,5
Côte d'Ivoire	3,7	4,5	3,8	2,5	3,7
Croatia	1,8	1,1	1,4	1,0	0,3
Cuba	3,2	2,4	2,0	3,0	0,5
Cyprus	3,3	0,9	2,7	2,6	1,8
Czech Republic	2,4	0,2	1,1	1,3	1,0
Dem. People's Republic of Korea	-0,5	7,6	3,8	1,9	1,1
Democratic Republic of the Congo	1,6	2,8	2,7	2,9	3,9

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Denmark	2,1	0,9	1,0	1,4	0,2
Djibouti	5,0	6,8	3,8	3,5	3,7
Dominican Republic	3,2	4,1	3,4	3,6	2,3
Ecuador	1,6	2,7	3,5	3,7	2,7
Egypt	2,7	2,8	3,2	3,6	3,1
El Salvador	2,2	2,8	2,5	2,3	2,7
Equatorial Guinea	0,3	0,9	1,0	5,7	1,7
Eritrea	1,3	2,9	2,3	2,8	5,8
Estonia	1,7	0,8	0,6	0,7	0,7
Ethiopia	1,9	2,7	3,3	3,3	3,8
Fiji	2,1	2,8	3,4	3,6	1,9
Finland	2,4	1,7	1,8	1,4	0,0
France	1,5	0,8	1,4	1,6	0,5
French Guiana	2,4	3,0	4,4	5,4	2,6
French Polynesia	2,9	3,9	4,5	4,2	2,0
Gabon	0,4	1,4	1,3	3,4	3,2
Gambia	2,1	2,8	2,7	4,1	4,4
Georgia	0,4	1,8	0,1	1,2	0,3
Germany	2,2	0,2	1,4	1,5	-0,1
Ghana	3,2	3,0	3,5	3,5	3,6
Greece	3,2	1,7	1,5	1,3	0,8
Grenada	1,2	1,8	-0,4	2,4	2,7
Guadeloupe	2,5	3,2	3,0	2,8	0,5
Guam	3,4	6,1	4,0	3,8	1,3
Guatemala	3,1	3,4	3,1	3,1	3,9
Guinea	-0,5	1,6	2,5	3,1	3,6
Guinea-Bissau	0,6	2,5	1,7	2,3	3,7
Guyana	1,9	1,4	-0,1	4,5	1,8
Haiti	2,3	2,0	2,2	2,6	3,4
Honduras	1,7	3,3	3,2	3,9	3,8
Hungary	2,4	0,5	0,7	0,6	0,8
Iceland	2,6	1,9	1,9	2,8	1,4
India	2,0	2,8	2,8	3,5	2,7
Indonesia	1,6	2,7	2,8	4,0	2,7
Iran (Islamic Republic of)	0,5	3,4	3,0	4,2	3,9
Iraq	4,7	1,9	2,1	4,1	4,5
Ireland	0,2	0,7	1,6	2,6	1,7
Israel	6,7	3,1	3,5	2,6	1,9
Italy	2,2	1,5	1,6	1,3	0,4
Jamaica	3,3	1,9	1,1	3,1	1,1
Japan	2,7	3,3	3,0	0,7	0,0
Jordan	4,8	3,5	3,5	3,6	4,4
Kazakhstan	2,3	1,9	0,0	2,9	1,9
Kenya	2,2	2,4	2,7	3,6	4,5
Kuwait	5,8	5,0	3,3	6,2	5,5
Kyrgyzstan	1,0	1,6	-0,4	4,1	2,8
Lao People's Democratic Republic	3,8	2,7	2,1	3,6	3,7
Latvia	1,5	0,6	0,5	0,5	0,7
Lebanon	0,9	1,3	3,1	3,1	2,3
Lesotho	1,5	2,2	1,3	0,3	2,8
Liberia	1,7	1,9	3,2	3,4	4,0
Libyan Arab Jamahiriya	0,8	3,6	4,1	4,0	4,0
Lithuania	1,6	1,1	0,8	0,8	0,5
Luxembourg	1,9	0,7	1,4	2,5	1,5
Madagascar	3,0	1,7	2,7	4,3	3,8
Malawi	0,7	4,4	3,1	2,3	4,0
Malaysia	1,4	2,8	3,8	4,6	2,4
Maldives	1,4	4,0	3,5	4,5	4,3
Mali	1,1	2,1	1,3	3,1	4,5
Malta	1,5	1,3	2,8	1,9	0,8
Martinique	2,1	3,1	2,6	2,5	0,2

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Mauritania	4,3	3,4	2,8	3,9	3,8
Mauritius	2,1	3,7	3,3	3,8	1,4
Mayotte	1,2	1,8	2,2	6,5	4,7
Mexico	3,3	3,2	3,1	3,9	2,5
Micronesia (Fed. States of)	2,3	2,4	1,3	3,1	2,5
Mongolia	3,2	1,6	0,7	4,8	3,4
Montenegro	1,5	1,7	1,8	1,6	0,9
Morocco	4,2	2,5	2,6	3,8	2,6
Mozambique	2,1	2,1	2,6	2,7	2,8
Myanmar	2,5	2,7	1,6	3,8	2,5
Namibia	1,6	2,7	2,7	3,5	3,1
Nepal	3,3	2,6	3,1	3,4	3,7
Netherlands	2,5	1,6	1,7	2,0	0,0
Netherlands Antilles	1,4	2,0	2,4	3,2	1,4
New Caledonia	2,3	3,4	4,4	3,4	2,0
New Zealand	1,7	1,9	2,2	2,6	0,9
Nicaragua	2,5	3,6	2,9	4,1	3,5
Niger	5,7	4,0	3,9	3,9	3,7
Nigeria	2,1	2,6	2,6	2,6	3,6
Norway	2,2	1,2	0,7	1,9	0,7
Occupied Palestinian Territory	-1,7	1,9	4,5	4,4	4,3
Oman	2,3	2,8	2,9	7,5	3,8
Pakistan	0,8	3,2	2,7	3,2	3,5
Panama	2,8	2,9	3,3	3,9	2,4
Papua New Guinea	-0,5	2,9	3,3	4,0	3,7
Paraguay	3,5	3,3	3,2	3,5	3,0
Peru	2,7	3,0	3,2	3,5	2,7
Philippines	2,7	2,5	3,1	4,3	3,1
Poland	3,6	1,5	1,3	1,6	0,9
Portugal	1,8	2,1	1,5	1,4	0,6
Puerto Rico	3,2	3,0	1,8	1,6	1,1
Qatar	4,3	5,7	5,7	9,3	6,3
Republic of Korea	2,7	3,3	4,2	3,6	0,8
Republic of Moldova	1,4	2,4	0,1	1,4	0,9
Réunion	2,6	3,6	3,2	3,8	1,4
Romania	3,2	1,5	0,9	1,1	1,0
Russian Federation	2,5	2,1	0,3	1,4	0,8
Rwanda	2,2	3,0	2,6	3,4	4,5
Saint Lucia	1,9	3,3	0,9	3,5	2,7
Saint Vincent and the Grenadines	2,6	1,5	0,7	3,2	1,6
Samoa	1,1	4,4	1,6	3,0	0,7
Sao Tome and Principe	2,0	2,0	0,6	2,8	4,5
Saudi Arabia	2,8	3,6	3,4	5,4	5,0
Senegal	1,1	3,1	2,4	3,3	4,6
Serbia	1,8	1,6	1,4	1,0	0,9
Sierra Leone	1,4	1,6	0,7	3,1	3,8
Singapore	5,6	3,8	5,2	4,8	1,0
Slovakia	3,0	1,0	1,1	2,0	1,3
Slovenia	2,3	1,2	1,9	1,8	0,6
Solomon Islands	5,4	2,3	3,4	4,0	4,2
Somalia	2,6	2,8	1,4	3,6	3,4
South Africa	2,1	2,1	3,3	2,5	1,7
Spain	2,2	2,2	1,6	2,0	1,3
Sri Lanka	-1,5	3,4	2,8	3,1	1,5
Sudan	1,7	3,1	3,2	3,4	3,6
Suriname	0,9	1,6	2,5	3,5	2,0
Swaziland	2,4	3,0	2,6	1,7	2,4
Sweden	2,0	1,1	0,9	1,2	0,6
Switzerland	2,2	1,3	1,5	2,0	0,5
Syrian Arab Republic	2,2	2,7	3,2	4,6	3,4
Tajikistan	3,3	2,0	0,1	4,3	3,2

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
TFYR Macedonia	0,0	2,3	2,3	2,0	1,1
Thailand	3,2	3,8	3,8	3,5	1,2
Timor-Leste	0,4	-0,2	3,8	3,2	3,6
Togo	0,5	2,6	2,9	3,2	3,8
Tonga	4,6	3,0	1,1	2,1	1,7
Trinidad and Tobago	2,5	2,1	1,9	3,4	1,9
Tunisia	0,5	3,1	2,9	3,5	2,7
Turkey	3,3	2,3	3,2	3,9	2,6
Turkmenistan	1,6	1,8	1,5	4,3	3,0
Uganda	2,5	3,2	2,6	2,8	4,3
Ukraine	2,4	1,9	-0,1	0,4	0,6
United Arab Emirates	1,8	8,8	4,4	13,9	6,2
United Kingdom	1,4	0,6	0,8	1,5	0,6
United Republic of Tanzania	3,3	3,4	3,4	3,0	4,0
United States of America	2,0	1,8	1,5	2,3	0,8
United States Virgin Islands	1,1	4,9	4,4	1,7	-0,8
Uruguay	1,6	1,7	0,9	1,3	1,2
Uzbekistan	3,0	1,2	1,3	4,4	3,1
Vanuatu	3,2	3,5	2,6	4,4	3,7
Venezuela (Bolivarian Republic of)	5,3	4,1	3,9	4,0	2,6
Viet Nam	2,6	1,9	2,1	4,6	2,7
Western Sahara	7,6	5,5	4,3	7,4	4,0
Yemen	0,2	1,9	4,3	3,5	5,0
Zambia	2,8	3,3	2,8	1,7	3,9
Zimbabwe	2,8	3,1	2,2	1,2	5,0

Table 3C: Average annual growth rate of population aged 80 and older (percent)

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
World	**2,8**	**3,9**	**3,1**	**3,1**	**3,6**
More developed regions	**3,2**	**3,4**	**2,7**	**2,2**	**1,9**
Less developed regions	**2,2**	**4,8**	**3,7**	**3,9**	**4,6**
Africa	**3,1**	**3,0**	**3,7**	**4,0**	**4,1**
Asia	**2,1**	**5,1**	**3,8**	**3,7**	**4,2**
Europe	**2,8**	**3,2**	**2,1**	**1,8**	**2,1**
Latin America & Caribbean	**3,3**	**4,7**	**4,4**	**3,8**	**4,1**
Northern America	**3,8**	**3,1**	**2,7**	**2,4**	**2,6**
Oceania	**2,8**	**3,7**	**3,8**	**3,2**	**2,8**
Afghanistan	3,2	0,9	4,8	4,2	4,3
Albania	1,7	2,8	2,9	3,9	3,5
Algeria	5,8	1,8	2,7	3,9	5,9
Angola	-0,5	4,1	3,8	3,9	4,7
Argentina	4,3	4,5	3,9	2,4	2,4
Armenia	2,9	1,6	3,7	0,6	3,6
Aruba	3,0	8,0	1,6	4,7	4,3
Australia	2,9	3,8	3,9	3,1	2,6
Austria	3,2	2,8	1,9	2,1	2,6
Azerbaijan	5,2	-2,7	4,9	1,3	6,6
Bahamas	3,1	3,1	4,5	5,1	4,8
Bahrain	6,2	2,6	3,9	4,7	10,4
Bangladesh	1,5	3,6	3,4	3,0	5,7
Barbados	1,9	3,5	1,7	1,7	3,5
Belarus	1,9	2,5	1,2	0,3	2,3
Belgium	2,5	2,8	2,1	1,5	2,1
Belize	5,4	3,2	3,4	3,0	6,0
Benin	-2,2	2,3	2,2	3,7	4,5
Bhutan	3,4	5,1	5,5	3,9	4,9
Bolivia (Plurinational State of)	2,5	3,8	4,1	4,3	4,3
Bosnia and Herzegovina	1,7	3,6	4,6	2,6	2,8
Botswana	3,1	1,6	4,1	4,3	1,9
Brazil	4,1	5,2	5,5	4,2	4,1
Brunei Darussalam	2,3	4,5	3,5	5,5	6,3
Bulgaria	4,4	2,4	1,9	1,0	0,9
Burkina Faso	0,9	3,8	3,1	5,0	5,3
Burundi	1,9	4,0	1,9	2,9	4,3
Cambodia	2,1	1,9	4,9	4,6	4,9
Cameroon	3,4	3,8	2,6	3,0	3,5
Canada	4,1	3,2	3,6	3,0	2,8
Cape Verde	-1,3	3,2	3,5	1,2	5,7
Central African Republic	1,0	3,4	2,3	2,5	2,8
Chad	1,2	2,9	2,5	2,9	4,2
Channel Islands	2,0	2,3	1,2	3,0	2,4
Chile	4,8	3,5	4,3	3,9	3,8
China	2,1	7,1	3,1	3,8	4,6
China, Hong Kong SAR	2,2	11,0	5,8	3,4	4,4
China, Macao SAR	2,7	6,4	3,6	4,2	6,2
Colombia	3,5	4,5	4,0	4,4	4,8
Comoros	1,3	3,4	2,8	2,6	5,3
Congo	4,5	3,7	2,8	2,9	3,9
Costa Rica	4,8	3,7	4,4	4,1	5,0
Côte d'Ivoire	4,9	5,5	4,4	4,5	3,0
Croatia	0,5	3,1	3,0	1,9	1,7
Cuba	2,6	5,8	2,3	3,2	3,8
Cyprus	6,5	1,9	2,8	3,3	2,8
Czech Republic	2,6	2,7	2,0	2,8	1,2
Dem. People's Republic of Korea	0,9	3,4	7,2	3,4	3,7
Democratic Republic of the Congo	-2,5	3,4	2,9	3,4	4,0

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Denmark	3,3	3,2	0,9	2,8	1,5
Djibouti	5,7	7,6	4,6	4,5	4,2
Dominican Republic	3,3	5,1	6,5	3,3	4,2
Ecuador	3,2	3,6	4,6	4,1	4,2
Egypt	5,0	3,8	4,9	4,9	4,3
El Salvador	4,3	4,0	3,5	2,9	3,1
Equatorial Guinea	1,0	1,9	2,3	1,8	7,1
Eritrea	1,7	4,5	1,7	4,6	3,9
Estonia	1,4	2,2	1,7	1,3	1,2
Ethiopia	2,4	3,4	4,3	4,5	3,9
Fiji	-0,6	3,7	2,5	6,4	4,6
Finland	2,7	5,1	2,9	3,0	1,1
France	2,8	3,0	2,3	2,0	1,9
French Guiana	4,8	2,7	4,4	5,4	5,9
French Polynesia	2,9	5,8	6,0	4,6	5,2
Gabon	0,8	3,0	2,4	2,2	4,3
Gambia	0,3	5,3	3,0	3,9	6,5
Georgia	2,4	0,9	1,7	0,7	2,4
Germany	4,0	3,3	1,8	2,1	2,3
Ghana	4,5	4,0	4,4	4,4	4,3
Greece	4,2	2,7	2,9	1,7	2,1
Grenada	-0,6	2,2	2,7	0,1	4,0
Guadeloupe	5,3	4,0	4,5	3,0	3,3
Guam	3,8	5,8	5,9	4,6	4,4
Guatemala	4,7	4,2	4,6	4,1	3,8
Guinea	-0,9	2,1	4,5	3,3	4,1
Guinea-Bissau	0,0	3,7	2,8	3,2	2,8
Guyana	1,3	4,0	-1,2	4,0	5,7
Haiti	-0,8	3,5	2,8	3,3	4,1
Honduras	-1,7	4,4	5,6	3,7	4,7
Hungary	3,1	2,8	1,9	1,4	1,1
Iceland	2,2	3,6	2,6	2,8	3,2
India	1,5	3,6	3,9	4,0	4,4
Indonesia	2,5	3,2	3,7	4,8	5,4
Iran (Islamic Republic of)	1,7	1,7	7,1	2,7	5,6
Iraq	2,0	5,6	2,7	3,0	6,0
Ireland	1,5	1,3	2,3	3,4	3,0
Israel	9,3	5,8	4,9	3,3	2,7
Italy	3,3	3,4	3,2	1,9	2,0
Jamaica	7,3	4,8	1,5	1,5	4,4
Japan	4,8	5,6	5,1	3,2	0,2
Jordan	8,6	4,5	0,8	4,6	5,1
Kazakhstan	3,9	2,5	0,2	1,7	4,2
Kenya	3,6	3,6	2,9	3,3	4,2
Kuwait	6,1	8,9	1,6	5,2	8,7
Kyrgyzstan	2,8	1,8	0,9	0,3	6,3
Lao People's Democratic Republic	5,5	4,4	3,9	3,1	5,2
Latvia	1,5	2,1	1,1	0,9	1,3
Lebanon	1,6	1,7	3,2	2,8	4,6
Lesotho	2,4	2,5	2,8	1,4	0,3
Liberia	1,4	2,0	4,3	3,8	4,3
Libyan Arab Jamahiriya	1,1	3,9	6,0	5,2	5,0
Lithuania	1,5	3,0	1,2	0,9	1,9
Luxembourg	2,3	3,2	2,6	2,2	3,5
Madagascar	3,9	4,6	3,3	3,9	5,4
Malawi	0,8	4,7	4,5	4,4	2,7
Malaysia	1,2	2,9	3,0	5,9	5,2
Maldives	0,3	2,7	7,2	5,4	6,2
Mali	-0,2	3,8	2,9	3,4	5,4
Malta	3,1	3,5	3,1	3,9	1,5
Martinique	2,9	6,3	3,8	2,7	3,0

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
Mauritania	7,0	5,0	3,7	4,4	5,8
Mauritius	1,6	4,7	5,6	4,0	4,4
Mayotte	-5,8	3,5	2,9	4,2	7,1
Mexico	2,1	4,6	4,1	3,8	4,7
Micronesia (Fed. States of)	1,9	2,6	2,7	2,0	4,1
Mongolia	6,2	3,9	0,9	3,0	6,4
Montenegro	3,0	1,6	1,4	2,5	2,3
Morocco	10,3	-0,4	3,8	3,6	5,1
Mozambique	3,0	3,5	4,1	3,9	3,3
Myanmar	3,2	4,0	3,2	2,6	5,4
Namibia	3,3	2,9	3,8	4,0	4,1
Nepal	6,5	4,1	4,1	4,3	5,0
Netherlands	4,0	3,3	2,1	3,0	2,2
Netherlands Antilles	0,5	5,0	2,1	3,4	3,8
New Caledonia	3,3	5,9	5,6	4,7	3,5
New Zealand	3,5	2,9	3,5	3,1	2,8
Nicaragua	4,2	4,7	5,8	3,6	5,0
Niger	-0,8	8,2	4,3	5,8	5,1
Nigeria	3,8	3,3	3,3	3,7	3,4
Norway	2,2	3,0	1,7	2,3	2,2
Occupied Palestinian Territory	0,3	1,2	4,2	5,7	5,6
Oman	6,3	3,6	3,6	3,2	7,8
Pakistan	-0,6	2,4	3,2	3,3	4,2
Panama	4,6	3,8	3,9	4,3	4,5
Papua New Guinea	-1,3	3,1	4,2	4,8	5,2
Paraguay	3,6	4,2	4,8	3,9	3,9
Peru	2,6	5,4	4,8	4,2	4,2
Philippines	3,1	3,4	2,5	5,1	5,6
Poland	2,7	4,4	2,7	1,9	1,8
Portugal	2,3	3,5	2,8	2,1	1,9
Puerto Rico	6,3	3,4	2,6	2,4	2,2
Qatar	6,5	7,6	3,7	6,1	13,1
Republic of Korea	2,1	4,4	6,1	5,1	4,0
Republic of Moldova	1,3	2,4	1,9	1,1	2,6
Réunion	4,2	4,8	4,3	3,6	4,4
Romania	4,1	3,2	2,4	1,6	2,1
Russian Federation	2,3	3,5	1,5	0,9	2,1
Rwanda	4,4	2,6	4,0	4,1	4,0
Saint Lucia	-2,1	6,2	3,3	2,2	4,8
Saint Vincent and the Grenadines	1,8	4,6	1,1	0,8	4,8
Samoa	-0,7	5,1	4,7	2,5	4,3
Sao Tome and Principe	1,7	1,5	1,0	1,2	4,7
Saudi Arabia	7,6	6,2	2,4	3,6	5,5
Senegal	-1,0	2,5	3,0	4,2	6,2
Serbia	0,7	2,5	3,7	1,0	2,1
Sierra Leone	2,2	0,4	-1,7	4,9	6,3
Singapore	2,1	7,4	5,8	5,9	4,9
Slovakia	2,6	3,5	2,0	2,2	2,4
Slovenia	1,4	4,1	3,1	2,4	2,2
Solomon Islands	5,4	5,6	2,5	5,1	5,3
Somalia	5,3	4,5	2,1	3,4	4,8
South Africa	4,9	1,7	3,6	4,3	2,9
Spain	2,9	4,0	3,4	2,0	2,8
Sri Lanka	-5,6	4,1	3,8	4,3	3,4
Sudan	2,9	3,0	3,6	4,5	4,4
Suriname	-0,3	3,1	2,4	3,3	4,6
Swaziland	4,4	3,5	3,5	3,2	1,5
Sweden	2,8	3,3	1,5	2,4	1,3
Switzerland	3,6	4,1	2,0	2,6	2,5
Syrian Arab Republic	7,2	1,2	3,2	4,1	5,7
Tajikistan	6,3	3,1	0,5	1,5	6,3

	1950 - 1970	1970 - 1990	1990 - 2010	2010 - 2030	2030 - 2050
TFYR Macedonia	-0,1	1,4	3,3	2,7	2,8
Thailand	3,1	5,1	4,9	3,7	4,0
Timor-Leste	1,9	-1,3	4,8	5,3	4,0
Togo	1,6	2,8	3,7	3,7	4,1
Tonga	7,7	3,5	3,7	1,0	3,5
Trinidad and Tobago	3,8	2,5	2,3	3,6	4,1
Tunisia	-3,9	5,9	4,7	3,0	4,9
Turkey	2,8	4,9	4,2	4,4	4,9
Turkmenistan	3,9	2,0	2,4	1,6	6,1
Uganda	3,1	3,4	4,0	3,4	3,6
Ukraine	1,9	3,3	1,0	0,2	1,6
United Arab Emirates	7,5	7,8	1,9	8,2	14,9
United Kingdom	2,6	2,5	1,7	2,2	2,0
United Republic of Tanzania	4,8	4,3	4,3	4,6	3,6
United States of America	3,8	3,0	2,6	2,3	2,6
United States Virgin Islands	2,2	2,7	6,6	5,3	1,1
Uruguay	1,4	2,5	2,8	1,5	2,0
Uzbekistan	5,0	3,1	1,5	1,7	6,0
Vanuatu	4,4	5,9	1,0	4,6	5,7
Venezuela (Bolivarian Republic of)	5,5	7,2	5,3	4,8	4,4
Viet Nam	3,8	4,3	4,0	3,0	5,9
Western Sahara	6,5	9,7	4,4	4,7	8,5
Yemen	1,0	2,5	4,9	4,1	4,8
Zambia	3,5	4,1	3,3	3,8	2,2
Zimbabwe	5,3	3,7	3,4	3,0	1,1

Table 4A: Percentage of population aged 60 and older (country rankings)

	2012	2030	2050
Japan	1	1	1
Italy	2	3	7
Germany	3	2	11
Finland	4	15	48
Sweden	5	28	55
Bulgaria	6	23	19
Greece	7	17	21
Portugal	8	7	2
Croatia	9	20	26
Channel Islands	10	4	22
Belgium	11	22	52
Denmark	12	27	62
France	13	24	56
Austria	14	5	17
Slovenia	15	12	14
Switzerland	16	8	13
Hungary	17	41	38
Estonia	18	39	37
Latvia	19	35	28
United Kingdom	20	34	63
Czech Republic	21	32	27
Netherlands	22	14	44
Spain	23	18	8
Malta	24	21	15
United States Virgin Islands	25	10	60
Norway	26	36	68
Lithuania	27	38	41
Ukraine	28	45	43
Romania	29	40	20
Canada	30	25	51
Martinique	31	9	16
Serbia	32	47	39
Poland	33	37	24
Bosnia and Herzegovina	34	19	3
Georgia	35	30	23
Australia	36	49	69
China, Hong Kong SAR	37	6	12
Luxembourg	38	52	64
United States of America	39	46	81
New Zealand	40	43	74
Belarus	41	48	40
Russian Federation	42	53	50
Uruguay	43	64	80
Puerto Rico	44	51	47
Montenegro	45	55	54
Slovakia	46	44	25
Guadeloupe	47	29	35
Cuba	48	11	5
TFYR Macedonia	49	50	29
Iceland	50	57	72
Barbados	51	31	33
Ireland	52	60	73
Cyprus	53	59	36
Republic of Moldova	54	58	32
Republic of Korea	55	16	6
Netherlands Antilles	56	33	4
Singapore	57	13	10
Israel	58	76	106
Aruba	59	26	59
Armenia	60	62	58
Argentina	61	79	90
Chile	62	61	57

	2012	2030	2050
Thailand	63	56	45
Albania	64	63	31
Dem. People's Republic of Korea	65	71	100
China	66	54	30
Sri Lanka	67	68	79
China, Macao SAR	68	42	9
New Caledonia	69	73	86
Réunion	70	66	88
Mauritius	71	65	65
Guam	72	74	112
Trinidad and Tobago	73	67	46
Bahamas	74	69	75
Jamaica	75	75	85
Brazil	76	72	67
Lebanon	77	82	76
Tunisia	78	83	71
Kazakhstan	79	93	122
Costa Rica	80	70	61
Panama	81	89	101
French Polynesia	82	77	82
Saint Vincent and the Grenadines	83	81	95
El Salvador	84	108	116
Grenada	85	96	66
Saint Lucia	86	85	78
Suriname	87	87	96
Turkey	88	86	84
Mexico	89	84	87
Ecuador	90	92	98
Dominican Republic	91	100	111
Peru	92	103	105
Colombia	93	88	97
Venezuela (Bolivarian Republic of)	94	97	109
Azerbaijan	95	80	91
Viet Nam	96	78	53
Morocco	97	99	93
Indonesia	98	90	89
Myanmar	99	94	92
Fiji	100	102	119
Egypt	101	111	120
Malaysia	102	101	118
Tonga	103	129	145
Paraguay	104	122	129
India	105	113	123
Iran (Islamic Republic of)	106	91	34
South Africa	107	125	138
Samoa	108	115	147
French Guiana	109	110	133
Bolivia (Plurinational State of)	110	131	137
Cape Verde	111	109	99
Bhutan	112	121	94
Algeria	113	107	83
Guyana	114	98	108
Maldives	115	106	49
Libyan Arab Jamahiriya	116	119	103
Bangladesh	117	117	107
Haiti	118	140	135
Gabon	119	139	142
Nicaragua	120	123	115
Botswana	121	147	143
Cambodia	122	126	124
Pakistan	123	138	134
Guatemala	124	150	155

	2012	2030	2050
Uzbekistan	125	112	114
Brunei Darussalam	126	105	102
Micronesia (Fed. States of)	127	135	139
Kyrgyzstan	128	124	130
Honduras	129	133	131
Nepal	130	136	132
Turkmenistan	131	118	121
Lesotho	132	172	168
Syrian Arab Republic	133	128	128
Philippines	134	130	136
Lao People's Democratic Republic	135	132	125
Mongolia	136	116	117
Zimbabwe	137	175	150
Côte d'Ivoire	138	160	163
Ghana	139	148	153
Central African Republic	140	166	164
Namibia	141	145	141
Jordan	142	141	127
Belize	143	127	126
Sudan	144	151	158
Vanuatu	145	146	144
Djibouti	146	149	148
Congo	147	159	166
Guinea-Bissau	148	173	176
Cameroon	149	164	165
Swaziland	150	167	175
Ethiopia	151	153	151
Togo	152	155	156
Nigeria	153	174	183
Sao Tome and Principe	154	161	146
Mozambique	155	170	185
Solomon Islands	156	152	152
Guinea	157	169	174
Tajikistan	158	143	140
Saudi Arabia	159	137	113
United Republic of Tanzania	160	182	190
Malawi	161	193	194
Timor-Leste	162	179	186
Madagascar	163	158	167
Iraq	164	165	162
Papua New Guinea	165	154	157
Burundi	166	157	149
Benin	167	171	179
Zambia	168	196	196
Oman	169	104	70
Equatorial Guinea	170	142	169
Chad	171	185	187
Mauritania	172	162	161
Occupied Palestinian Territory	173	163	159
Somalia	174	180	192
Rwanda	175	178	173
Liberia	176	176	181
Western Sahara	177	120	104
Kenya	178	177	171
Comoros	179	168	172
Democratic Republic of the Congo	180	187	184
Yemen	181	183	170
Eritrea	182	189	160
Kuwait	183	134	110
Angola	184	181	180
Uganda	185	194	193
Senegal	186	186	177
Niger	187	192	195
Bahrain	188	95	42
Afghanistan	189	191	188
Burkina Faso	190	190	189
Sierra Leone	191	188	182
Gambia	192	184	178
Mali	193	195	191
Mayotte	194	156	154
Qatar	195	144	77
United Arab Emirates	196	114	18

Table 4B: Percentage of population aged 80 and older (country rankings)

	2012	2030	2050
Japan	1	1	1
Italy	2	2	5
France	3	8	20
Germany	4	5	2
Belgium	5	19	25
Greece	6	15	18
Sweden	7	6	26
Spain	8	12	12
Switzerland	9	7	8
Portugal	10	9	13
Austria	11	10	10
Finland	12	3	19
United Kingdom	13	20	30
Estonia	14	27	46
Norway	15	21	29
Latvia	16	34	45
Slovenia	17	18	17
Croatia	18	25	32
Martinique	19	16	4
Denmark	20	13	28
Channel Islands	21	11	11
Hungary	22	33	57
Bulgaria	23	32	44
Netherlands	24	14	16
Canada	25	22	24
Lithuania	26	40	49
Luxembourg	27	43	38
China, Hong Kong SAR	28	24	7
Australia	29	28	36
United States of America	30	36	41
Czech Republic	31	23	42
Uruguay	32	44	61
Poland	33	37	43
Guadeloupe	34	26	14
New Zealand	35	30	31
Iceland	36	39	39
Puerto Rico	37	31	34
Serbia	38	53	64
Ukraine	39	54	71
Romania	40	45	50
Georgia	41	48	40
Belarus	42	57	66
Malta	43	17	27
Cuba	44	29	3
Barbados	45	51	33
Bosnia and Herzegovina	46	41	23
Israel	47	49	75
Russian Federation	48	56	74
Ireland	49	42	52
United States Virgin Islands	50	4	15
Armenia	51	68	63
Slovakia	52	50	55
Cyprus	53	47	54
Argentina	54	59	79
Montenegro	55	55	65
Netherlands Antilles	56	46	21
Republic of Moldova	57	67	68
TFYR Macedonia	58	58	62
Republic of Korea	59	35	9
Chile	60	52	37
Réunion	61	62	51
Jamaica	62	76	59

	2012	2030	2050
Singapore	63	38	6
China, Macao SAR	64	65	22
Grenada	65	89	87
Thailand	66	64	48
New Caledonia	67	61	69
Albania	68	63	53
El Salvador	69	73	94
Saint Lucia	70	82	77
Brazil	71	69	60
Sri Lanka	72	66	72
Aruba	73	60	35
Costa Rica	74	72	56
Dominican Republic	75	81	85
China	76	71	47
Mexico	77	77	76
Mauritius	78	70	58
Saint Vincent and the Grenadines	79	94	100
Viet Nam	80	87	67
Ecuador	81	78	83
Tonga	82	109	129
Cape Verde	83	113	106
Trinidad and Tobago	84	74	73
Panama	85	79	84
Azerbaijan	86	115	99
Tunisia	87	92	90
Lebanon	88	91	88
Guam	89	80	82
Peru	90	84	95
Suriname	91	90	91
Dem. People's Republic of Korea	92	88	102
Bahamas	93	75	70
Colombia	94	83	80
Kazakhstan	95	104	118
Iran (Islamic Republic of)	96	101	93
French Polynesia	97	86	78
Venezuela (Bolivarian Republic of)	98	85	96
Samoa	99	102	115
Nicaragua	100	98	103
Paraguay	101	97	120
Turkey	102	93	97
Uzbekistan	103	123	112
Kyrgyzstan	104	138	128
Honduras	105	111	124
Belize	106	118	114
Morocco	107	105	105
Guatemala	108	119	141
Myanmar	109	121	113
Gabon	110	129	146
Indonesia	111	95	92
Turkmenistan	112	131	125
Brunei Darussalam	113	96	86
Algeria	114	114	104
Maldives	115	99	81
Bhutan	116	117	119
Egypt	117	107	123
Guyana	118	103	89
Bangladesh	119	124	117
India	120	116	127
French Guiana	121	110	116
Bolivia (Plurinational State of)	122	120	135
Tajikistan	123	145	137
Mongolia	124	126	121

	2012	2030	2050
Lesotho	125	144	174
Syrian Arab Republic	126	122	122
Libyan Arab Jamahiriya	127	108	111
Micronesia (Fed. States of)	128	137	142
Zimbabwe	129	136	164
Sao Tome and Principe	130	161	157
South Africa	131	112	134
Pakistan	132	133	143
Malaysia	133	106	110
Saudi Arabia	134	130	130
Lao People's Democratic Republic	135	140	136
Haiti	136	142	147
Fiji	137	100	108
Jordan	138	127	133
Namibia	139	132	144
Ghana	140	139	148
Congo	141	152	162
Central African Republic	142	158	169
Nepal	143	135	140
Botswana	144	125	149
Oman	145	141	107
Philippines	146	128	131
Madagascar	147	156	155
Cameroon	148	160	165
Cambodia	149	134	138
Vanuatu	150	143	145
Togo	151	150	154
Côte d'Ivoire	152	147	163
Iraq	153	173	160
Equatorial Guinea	154	179	152
Swaziland	155	149	170
Mozambique	156	157	166
Mayotte	157	146	139
Sudan	158	151	158
Guinea	159	168	168
Ethiopia	160	148	153
Kenya	161	170	171
United Republic of Tanzania	162	163	181
Nigeria	163	166	179
Guinea-Bissau	164	171	182
Burundi	165	167	161
Zambia	166	177	195
Benin	167	172	167
Kuwait	168	165	132
Solomon Islands	169	153	151
Rwanda	170	169	175
Malawi	171	175	192
Djibouti	172	159	159
Uganda	173	182	189
Comoros	174	183	176
Occupied Palestinian Territory	175	155	150
Western Sahara	176	162	126
Papua New Guinea	177	164	156
Somalia	178	185	185
Yemen	179	178	173
Bahrain	180	154	98
Chad	181	186	186
Democratic Republic of the Congo	182	184	184
Liberia	183	180	183
Angola	184	181	178
Eritrea	185	176	177
Timor-Leste	186	174	180

	2012	2030	2050
Mauritania	187	187	172
Afghanistan	188	189	191
Burkina Faso	189	190	188
Mali	190	193	193
Gambia	191	195	187
Niger	192	192	194
Senegal	193	194	190
Qatar	194	188	109
Sierra Leone	195	196	196
United Arab Emirates	196	191	101

Table 5A: Percentage of population aged 60 and older under alternative total fertility rate scenarios

	2012	2030			2050		
		Low-fertility	Medium-fertility	High-fertility	Low-fertility	Medium-fertility	High-fertility
World	**11**	**18**	**17**	**16**	**25**	**22**	**19**
More developed regions	**22**	**30**	**29**	**27**	**36**	**32**	**28**
Less developed regions	**9**	**15**	**14**	**14**	**23**	**20**	**18**
Africa	**6**	**7**	**7**	**6**	**11**	**10**	**9**
Asia	**11**	**18**	**17**	**16**	**28**	**24**	**21**
Europe	**22**	**30**	**29**	**28**	**38**	**34**	**30**
Latin America & Caribbean	**10**	**18**	**17**	**16**	**29**	**25**	**22**
Northern America	**19**	**27**	**26**	**24**	**31**	**27**	**24**
Oceania	**16**	**21**	**20**	**19**	**27**	**24**	**21**
Afghanistan	4	5	4	4	8	7	6
Albania	14	24	22	21	40	34	29
Algeria	7	15	14	13	30	26	23
Angola	4	5	5	5	9	8	7
Argentina	15	19	18	17	29	25	22
Armenia	15	24	23	21	35	30	26
Aruba	15	31	29	28	35	30	26
Australia	20	26	25	24	33	29	26
Austria	24	35	33	31	41	36	32
Azerbaijan	9	19	18	17	29	25	22
Bahamas	11	22	20	19	32	28	25
Bahrain	4	16	15	14	36	32	29
Bangladesh	7	13	12	11	26	22	19
Barbados	17	29	28	27	39	34	30
Belarus	19	27	25	24	37	32	28
Belgium	24	31	30	28	35	31	28
Belize	6	12	11	10	22	18	16
Benin	5	6	6	5	9	8	7
Bhutan	7	12	12	11	28	24	21
Bolivia (Plurinational State of)	7	11	10	9	17	15	13
Bosnia and Herzegovina	20	32	30	29	46	40	35
Botswana	7	9	8	8	16	13	11
Brazil	11	20	19	18	34	29	25
Brunei Darussalam	6	15	14	13	27	23	20
Bulgaria	25	31	29	28	42	36	32
Burkina Faso	4	5	4	4	7	7	6
Burundi	5	7	7	6	14	12	11
Cambodia	7	12	11	10	22	19	16
Cameroon	5	6	6	6	11	9	8
Canada	21	31	29	28	35	31	28
Cape Verde	7	14	13	12	27	23	20
Central African Republic	6	6	6	6	11	10	9
Chad	5	5	5	5	8	7	6
Channel Islands	24	36	34	32	40	36	32
Chile	14	24	23	22	35	30	26
China	13	26	24	23	39	34	30
China, Hong Kong SAR	19	34	33	31	42	37	34
China, Macao SAR	12	28	26	25	43	38	34
Colombia	9	17	16	15	28	24	21
Comoros	4	6	6	6	10	9	8
Congo	6	7	6	6	11	9	8
Costa Rica	10	20	19	18	34	30	26
Côte d'Ivoire	6	7	6	6	11	10	9
Croatia	24	32	30	29	39	34	30
Cuba	18	33	32	30	45	39	34
Cyprus	17	25	23	22	37	32	29
Czech Republic	23	29	28	26	39	34	30
Dem. People's Republic of Korea	14	20	19	18	27	23	20
Democratic Republic of the Congo	4	5	5	4	8	7	6
Denmark	24	30	29	28	34	30	26
Djibouti	6	8	8	7	14	12	11
Dominican Republic	9	16	15	14	26	22	19
Ecuador	9	16	15	14	28	24	20
Egypt	8	13	13	12	23	20	18
El Salvador	10	14	13	12	25	21	18
Equatorial Guinea	5	9	9	8	10	9	8
Eritrea	4	5	5	4	12	10	9
Estonia	23	28	27	26	37	32	28
Ethiopia	5	7	7	7	14	12	11
Fiji	8	16	15	14	24	20	18
Finland	26	33	31	30	36	31	28
France	24	31	29	28	34	30	27
French Guiana	8	14	13	12	18	16	14
French Polynesia	10	20	18	17	31	27	23
Gabon	7	9	9	8	15	13	11
Gambia	4	5	5	5	9	8	7
Georgia	20	30	28	27	41	35	31
Germany	27	38	36	35	42	37	33
Ghana	6	8	8	7	14	12	11
Greece	25	32	31	29	40	36	32
Grenada	10	16	15	14	35	29	25
Guadeloupe	18	30	28	27	37	33	29
Guam	12	20	19	18	26	22	19
Guatemala	6	8	8	7	14	12	10
Guinea	5	6	6	6	9	8	7
Guinea-Bissau	6	6	6	5	9	8	7
Guyana	7	16	15	14	26	22	19
Haiti	7	9	9	8	18	15	13
Honduras	6	10	10	9	20	17	15
Hungary	23	28	27	25	37	32	28
Iceland	17	25	24	23	33	29	26
India	8	13	12	12	22	19	17
Indonesia	9	17	16	15	30	25	22
Iran (Islamic Republic of)	8	16	15	14	39	33	29
Iraq	5	6	6	6	11	10	9
Ireland	17	24	23	22	32	29	26
Israel	15	20	19	18	25	23	20
Italy	27	36	34	33	43	38	34
Jamaica	11	20	19	18	31	26	22
Japan	32	39	37	36	47	41	37
Jordan	6	9	9	8	21	18	16
Kazakhstan	10	16	15	14	23	20	17
Kenya	4	5	5	5	10	9	8
Kuwait	4	10	10	9	25	22	20
Kyrgyzstan	6	12	11	11	20	17	15
Lao People's Democratic Republic	6	10	10	9	22	19	16
Latvia	23	29	27	26	39	34	30
Lebanon	11	19	17	16	33	28	24
Lesotho	6	6	6	5	11	9	8
Liberia	4	5	5	5	9	8	7
Libyan Arab Jamahiriya	7	12	12	11	27	23	20
Lithuania	21	29	27	25	37	32	28
Luxembourg	19	26	25	23	33	30	26
Madagascar	5	7	7	6	10	9	8
Malawi	5	4	4	4	6	5	5
Malaysia	8	16	15	14	23	20	18
Maldives	7	15	14	13	36	31	27
Mali	3	4	4	4	7	6	5

	2012	2030			2050		
		Low-fertility	Medium-fertility	High-fertility	Low-fertility	Medium-fertility	High-fertility
Malta	23	32	30	28	42	37	32
Martinique	21	34	32	31	42	37	32
Mauritania	5	7	6	6	11	10	9
Mauritius	12	23	22	21	34	29	25
Mayotte	3	7	7	6	13	12	10
Mexico	10	18	17	16	30	26	22
Micronesia (Fed. States of)	6	10	10	9	17	15	13
Mongolia	6	13	12	11	24	20	18
Montenegro	18	26	24	23	36	31	27
Morocco	9	16	15	14	28	24	21
Mozambique	5	6	6	5	8	7	6
Myanmar	8	16	15	14	29	25	21
Namibia	6	9	9	8	16	13	12
Nepal	6	10	9	9	20	17	14
Netherlands	23	33	31	30	36	32	28
Netherlands Antilles	16	29	28	26	45	39	35
New Caledonia	12	20	19	18	30	26	23
New Zealand	19	27	26	25	32	29	25
Nicaragua	7	12	11	11	25	21	18
Niger	4	4	4	4	5	5	4
Nigeria	5	6	5	5	8	7	7
Norway	22	29	27	26	33	29	26
Occupied Palestinian Territory	4	7	6	6	12	10	9
Oman	5	15	14	13	33	29	25
Pakistan	7	10	9	9	18	16	14
Panama	10	17	16	16	27	23	20
Papua New Guinea	5	7	7	7	13	11	10
Paraguay	8	12	11	11	20	17	15
Peru	9	15	14	14	26	23	20
Philippines	6	11	10	9	18	15	13
Poland	20	29	27	26	40	35	31
Portugal	24	34	33	31	46	40	36
Puerto Rico	18	26	25	23	36	31	27
Qatar	2	9	9	8	30	28	26
Republic of Korea	17	33	31	29	44	39	35
Republic of Moldova	17	26	24	23	40	34	29
Réunion	12	22	21	20	29	26	22
Romania	21	28	27	25	41	36	32
Russian Federation	19	26	25	23	36	31	27
Rwanda	4	5	5	5	10	9	8
Saint Lucia	10	18	17	16	32	28	24
Saint Vincent and the Grenadines	10	19	18	17	28	24	21
Samoa	8	13	12	11	15	13	11
Sao Tome and Principe	5	7	6	6	15	13	11
Saudi Arabia	5	10	9	9	25	22	19
Senegal	4	5	5	4	9	8	7
Serbia	20	27	25	24	37	32	28
Sierra Leone	4	5	5	4	9	7	7
Singapore	15	33	31	30	42	38	34
Slovakia	18	27	26	24	40	35	31
Slovenia	23	33	32	30	41	37	33
Solomon Islands	5	7	7	7	14	12	11
Somalia	4	5	5	5	6	6	5
South Africa	8	12	11	10	18	15	13
Spain	23	32	31	29	43	38	34
Sri Lanka	13	22	20	19	32	27	24
Sudan	6	8	7	7	13	11	10
Suriname	10	17	16	16	28	24	21
Swaziland	5	6	6	6	10	8	7
Sweden	25	30	29	27	35	31	27
Switzerland	23	34	32	31	42	37	33
Syrian Arab Republic	6	12	11	10	21	18	16
Tajikistan	5	9	9	8	16	14	12
TFYR Macedonia	17	26	25	24	39	34	30
Thailand	14	26	24	23	37	32	28
Timor-Leste	5	5	5	5	8	7	6
Togo	5	7	7	7	13	12	10
Tonga	8	11	10	10	15	13	11
Trinidad and Tobago	11	22	21	20	37	32	27
Tunisia	10	18	17	16	33	29	25
Turkey	10	17	16	16	30	26	23
Turkmenistan	6	13	12	11	23	20	17
Uganda	4	4	4	4	6	6	5
Ukraine	21	27	25	24	37	32	28
United Arab Emirates	1	13	12	12	40	36	33
United Kingdom	23	29	27	26	34	30	26
United Republic of Tanzania	5	5	5	5	7	6	6
United States of America	19	27	25	24	30	27	24
United States Virgin Islands	23	34	32	30	34	30	26
Uruguay	19	23	22	21	32	27	24
Uzbekistan	6	13	12	12	25	21	19
Vanuatu	6	9	8	8	14	13	11
Venezuela (Bolivarian Republic of)	9	16	15	14	26	22	19
Viet Nam	9	19	18	17	36	31	27
Western Sahara	4	12	12	11	26	23	20
Yemen	4	5	5	5	10	9	8
Zambia	5	4	4	3	5	4	4
Zimbabwe	6	6	5	5	15	12	11

Table 5B: Percentage of population aged 80 and older under alternative total fertility rate scenarios

	2012	2030			2050		
		Low-fertility	Medium-fertility	High-fertility	Low-fertility	Medium-fertility	High-fertility
World	**2**	**2**	**2**	**2**	**5**	**4**	**4**
More developed regions	**4**	**7**	**6**	**6**	**11**	**9**	**8**
Less developed regions	**1**	**2**	**2**	**2**	**4**	**4**	**3**
Africa	**0**	**1**	**1**	**1**	**1**	**1**	**1**
Asia	**1**	**2**	**2**	**2**	**5**	**5**	**4**
Europe	**4**	**6**	**6**	**6**	**11**	**9**	**8**
Latin America & Caribbean	**2**	**3**	**3**	**2**	**6**	**6**	**5**
Northern America	**4**	**6**	**5**	**5**	**9**	**8**	**7**
Oceania	**3**	**4**	**4**	**4**	**7**	**6**	**6**
Afghanistan	0	0	0	0	0	0	0
Albania	2	4	3	3	9	7	6
Algeria	1	1	1	1	4	4	3
Angola	0	0	0	0	1	1	1
Argentina	3	4	3	3	6	5	5
Armenia	3	3	3	3	8	7	6
Aruba	2	4	3	3	10	9	7
Australia	4	6	6	5	10	8	8
Austria	5	7	7	7	14	12	11
Azerbaijan	1	1	1	1	5	4	4
Bahamas	1	3	3	2	7	6	5
Bahrain	0	1	1	1	5	4	4
Bangladesh	1	1	1	1	3	3	3
Barbados	3	4	4	4	10	9	8
Belarus	3	4	4	3	7	6	6
Belgium	5	7	6	6	11	10	9
Belize	1	1	1	1	4	3	3
Benin	0	0	0	0	1	1	1
Bhutan	1	1	1	1	3	3	3
Bolivia (Plurinational State of)	1	1	1	1	2	2	2
Bosnia and Herzegovina	3	5	5	4	11	10	8
Botswana	1	1	1	1	2	1	1
Brazil	2	3	3	3	8	7	6
Brunei Darussalam	1	2	2	1	6	5	4
Bulgaria	4	6	5	5	9	8	7
Burkina Faso	0	0	0	0	1	0	0
Burundi	0	1	0	0	1	1	1
Cambodia	0	1	1	1	2	2	2
Cameroon	0	1	1	1	1	1	1
Canada	4	6	6	6	11	10	9
Cape Verde	1	1	1	1	4	4	3
Central African Republic	1	1	1	1	1	1	1
Chad	0	0	0	0	1	0	0
Channel Islands	4	7	7	7	13	12	11
Chile	2	4	4	4	10	8	7
China	2	3	3	3	9	8	7
China, Hong Kong SAR	4	6	6	6	14	13	12
China, Macao SAR	2	3	3	3	11	10	9
Colombia	1	2	2	2	6	5	4
Comoros	0	0	0	0	1	1	1
Congo	1	1	1	1	1	1	1
Costa Rica	2	3	3	3	8	7	6
Côte d'Ivoire	0	1	1	1	1	1	1
Croatia	4	6	6	6	10	9	8
Cuba	3	6	6	5	15	13	12
Cyprus	3	5	4	4	8	7	6
Czech Republic	4	6	6	6	9	8	7
Dem. People's Republic of Korea	1	2	2	2	5	4	4
Democratic Republic of the Congo	0	0	0	0	1	1	0
Denmark	4	7	7	6	10	9	8
Djibouti	0	1	1	1	1	1	1
Dominican Republic	2	2	2	2	6	5	4
Ecuador	1	2	2	2	6	5	4
Egypt	1	1	1	1	3	3	2
El Salvador	2	3	3	2	5	4	4
Equatorial Guinea	0	0	0	0	1	1	1
Eritrea	0	0	0	0	1	1	1
Estonia	5	6	6	5	9	8	7
Ethiopia	0	1	1	1	1	1	1
Fiji	1	2	1	1	4	4	3
Finland	5	9	8	8	11	10	9
France	6	8	7	7	11	10	9
French Guiana	1	1	1	1	4	3	3
French Polynesia	1	2	2	2	6	6	5
Gabon	1	1	1	1	2	2	1
Gambia	0	0	0	0	1	0	0
Georgia	3	4	4	4	9	8	7
Germany	5	8	8	8	15	13	12
Ghana	1	1	1	1	2	1	1
Greece	5	7	7	6	11	10	9
Grenada	2	2	2	2	6	5	4
Guadeloupe	4	6	6	5	13	11	10
Guam	1	2	2	2	6	5	4
Guatemala	1	1	1	1	2	2	2
Guinea	0	0	0	0	1	1	1
Guinea-Bissau	0	0	0	0	1	1	1
Guyana	1	2	1	1	5	5	4
Haiti	1	1	1	1	2	2	1
Honduras	1	1	1	1	3	3	2
Hungary	4	6	5	5	8	7	6
Iceland	4	5	5	5	9	8	7
India	1	1	1	1	3	3	2
Indonesia	1	2	2	2	5	5	4
Iran (Islamic Republic of)	1	2	1	1	5	5	4
Iraq	0	0	0	0	1	1	1
Ireland	3	5	5	4	8	7	7
Israel	3	4	4	4	7	6	5
Italy	6	9	8	8	14	13	12
Jamaica	2	3	3	2	8	7	6
Japan	7	13	13	12	16	15	13
Jordan	1	1	1	1	3	2	2
Kazakhstan	1	2	1	1	3	3	3
Kenya	0	0	0	0	1	1	1
Kuwait	0	1	0	0	2	2	2
Kyrgyzstan	1	1	1	1	3	2	2
Lao People's Democratic Republic	1	1	1	1	2	2	2
Latvia	4	6	5	5	9	8	7
Lebanon	1	2	2	2	5	5	4
Lesotho	1	1	1	1	1	1	1
Liberia	0	0	0	0	1	1	1
Libyan Arab Jamahiriya	1	1	1	1	4	3	3
Lithuania	4	5	5	5	9	8	7
Luxembourg	4	5	5	4	9	8	7
Madagascar	0	1	1	1	1	1	1
Malawi	0	0	0	0	0	0	0
Malaysia	1	1	1	1	4	3	3
Maldives	1	2	2	1	6	5	4
Mali	0	0	0	0	0	0	0

	2012	2030			2050		
		Low-fertility	Medium-fertility	High-fertility	Low-fertility	Medium-fertility	High-fertility
Malta	3	7	7	6	11	9	8
Martinique	4	7	7	6	15	13	12
Mauritania	0	0	0	0	1	1	1
Mauritius	1	3	3	3	8	7	6
Mayotte	0	1	1	1	2	2	2
Mexico	1	3	2	2	7	6	5
Micronesia (Fed. States of)	1	1	1	1	2	2	1
Mongolia	1	1	1	1	3	3	3
Montenegro	3	4	4	4	7	6	6
Morocco	1	1	1	1	4	4	3
Mozambique	0	1	1	1	1	1	1
Myanmar	1	1	1	1	4	3	3
Namibia	1	1	1	1	2	2	1
Nepal	1	1	1	1	2	2	2
Netherlands	4	7	7	6	12	11	10
Netherlands Antilles	2	4	4	4	11	10	9
New Caledonia	2	4	3	3	7	6	5
New Zealand	4	6	5	5	10	9	8
Nicaragua	1	2	2	1	5	4	3
Niger	0	0	0	0	0	0	0
Nigeria	0	1	0	0	1	1	1
Norway	5	7	6	6	10	9	8
Occupied Palestinian Territory	0	1	1	1	1	1	1
Oman	0	1	1	1	4	4	3
Pakistan	1	1	1	1	2	2	1
Panama	1	2	2	2	6	5	4
Papua New Guinea	0	1	1	0	1	1	1
Paraguay	1	2	2	1	3	3	3
Peru	1	2	2	2	5	4	4
Philippines	0	1	1	1	3	2	2
Poland	4	5	5	5	9	8	7
Portugal	5	8	7	7	13	12	10
Puerto Rico	3	6	5	5	10	9	8
Qatar	0	0	0	0	4	4	3
Republic of Korea	2	5	5	5	14	12	11
Republic of Moldova	2	3	3	3	7	6	5
Réunion	2	4	3	3	9	7	6
Romania	3	5	4	4	9	8	7
Russian Federation	3	4	4	3	7	6	5
Rwanda	0	0	0	0	1	1	1
Saint Lucia	2	2	2	2	7	6	5
Saint Vincent and the Grenadines	1	2	2	2	5	4	4
Samoa	1	2	1	1	4	3	3
Sao Tome and Principe	1	1	1	1	1	1	1
Saudi Arabia	1	1	1	1	3	2	2
Senegal	0	0	0	0	1	0	0
Serbia	3	4	4	4	7	6	6
Sierra Leone	0	0	0	0	0	0	0
Singapore	2	5	5	5	14	13	12
Slovakia	3	4	4	4	8	7	6
Slovenia	4	7	6	6	12	10	9
Solomon Islands	0	1	1	1	1	1	1
Somalia	0	0	0	0	1	1	0
South Africa	1	1	1	1	3	2	2
Spain	5	7	7	7	13	12	10
Sri Lanka	2	3	3	3	7	6	5
Sudan	0	1	1	1	1	1	1
Suriname	1	2	2	2	5	5	4
Swaziland	0	1	1	1	1	1	1
Sweden	5	8	8	7	11	10	8
Switzerland	5	8	8	7	14	13	11
Syrian Arab Republic	1	1	1	1	3	3	2
Tajikistan	1	1	1	1	2	2	2
TFYR Macedonia	2	4	4	3	8	7	6
Thailand	2	3	3	3	9	8	7
Timor-Leste	0	0	0	0	1	1	1
Togo	0	1	1	1	1	1	1
Tonga	1	1	1	1	3	2	2
Trinidad and Tobago	1	3	3	2	7	6	5
Tunisia	1	2	2	2	5	5	4
Turkey	1	2	2	2	5	4	4
Turkmenistan	1	1	1	1	3	3	2
Uganda	0	0	0	0	1	0	0
Ukraine	3	4	4	4	7	6	5
United Arab Emirates	0	0	0	0	5	4	4
United Kingdom	5	7	6	6	10	9	8
United Republic of Tanzania	0	1	1	0	1	1	1
United States of America	4	5	5	5	9	8	7
United States Virgin Islands	3	8	8	8	13	11	10
Uruguay	4	5	5	4	8	7	6
Uzbekistan	1	1	1	1	4	3	3
Vanuatu	0	1	1	1	2	2	1
Venezuela (Bolivarian Republic of)	1	2	2	2	5	4	4
Viet Nam	1	2	2	2	7	6	5
Western Sahara	0	1	1	1	3	3	2
Yemen	0	0	0	0	1	1	1
Zambia	0	0	0	0	0	0	0
Zimbabwe	1	1	1	1	1	1	1

Table 6: Life expectancy at birth and health life expectancy

	Life expectancy at birth						Healthy life expectancy at birth
	1950	1970	1990	2010	2030	2050	2002
World	**46**	**58**	**64**	**69**	**73**	**76**	**58**
More developed regions	**65**	**71**	**74**	**77**	**81**	**83**	**69**
Less developed regions	**41**	**54**	**62**	**67**	**71**	**75**	**56**
Africa	**37**	**45**	**51**	**56**	**63**	**69**	**44**
Asia	**42**	**56**	**64**	**70**	**74**	**77**	**59**
Europe	**64**	**71**	**73**	**76**	**79**	**82**	**67**
Latin America & Caribbean	**50**	**60**	**68**	**74**	**78**	**80**	**62**
Northern America	**68**	**71**	**75**	**79**	**81**	**83**	**70**
Oceania	**60**	**66**	**72**	**77**	**80**	**83**	**68**
Afghanistan	28	35	42	48	56	64	36
Albania	54	67	72	77	80	82	61
Algeria	42	53	67	73	77	79	61
Angola	29	37	41	51	58	65	33
Argentina	61	66	72	76	79	81	65
Armenia	62	70	68	74	77	80	61
Aruba	58	69	73	75	78	80	
Australia	69	71	77	82	84	86	73
Austria	66	70	75	81	83	85	71
Azerbaijan	57	65	65	71	74	77	57
Bahamas	59	66	69	75	79	81	64
Bahrain	41	64	72	75	78	80	64
Bangladesh	44	42	59	69	74	77	54
Barbados	55	69	75	77	79	82	66
Belarus	65	71	71	70	74	77	61
Belgium	67	71	76	80	82	84	71
Belize	56	66	72	76	79	80	60
Benin	32	40	49	56	63	69	44
Bhutan	36	41	53	67	73	76	53
Bolivia (Plurinational State of)	40	46	59	66	73	76	54
Bosnia and Herzegovina	52	66	67	76	78	80	64
Botswana	47	55	64	53	58	64	36
Brazil	50	59	66	73	77	80	60
Brunei Darussalam	56	67	73	78	80	82	65
Bulgaria	60	71	71	73	76	79	65
Burkina Faso	31	41	49	55	63	69	36
Burundi	38	44	46	50	58	65	35
Cambodia	39	44	56	63	70	75	48
Cameroon	38	46	53	51	58	65	41
Canada	68	73	77	81	83	85	72
Cape Verde	46	53	65	74	77	80	61
Central African Republic	33	42	49	48	58	65	37
Chad	37	44	51	49	57	64	41
Channel Islands	69	72	75	80	82	85	
Chile	54	62	74	79	81	83	67
China	43	63	69	73	77	79	64
China, Hong Kong SAR	62	72	78	82	85	87	
China, Macao SAR	60	70	76	81	83	86	
Colombia	48	61	68	73	77	79	62
Comoros	40	48	56	61	67	72	55
Congo	42	53	56	57	63	69	46
Costa Rica	56	67	76	79	81	84	67
Côte d'Ivoire	38	44	53	55	64	69	39
Croatia	60	69	72	76	79	82	67
Cuba	58	70	74	79	82	83	68
Cyprus	66	73	77	79	82	84	68
Czech Republic	66	70	72	78	80	83	68
Dem. People's Republic of Korea	48	62	71	69	72	76	59
Democratic Republic of the Congo	38	44	47	48	55	62	37
Denmark	70	73	75	79	81	84	70
Djibouti	34	43	51	58	65	70	43
Dominican Republic	44	58	68	73	77	79	60
Ecuador	47	58	69	75	78	81	62
Egypt	42	50	62	73	77	79	59
El Salvador	43	57	66	72	76	78	60
Equatorial Guinea	34	40	47	51	57	64	46
Eritrea	35	43	48	61	68	72	50
Estonia	64	71	69	75	78	80	64
Ethiopia	33	43	47	59	66	71	41
Fiji	51	60	66	69	73	76	59
Finland	65	70	75	80	83	85	71
France	66	72	77	81	84	86	72
French Guiana	52	65	72	76	79	81	
French Polynesia	46	60	69	75	78	81	
Gabon	36	47	61	62	68	72	51
Gambia	31	38	53	58	64	70	50
Georgia	60	67	71	74	77	79	64
Germany	67	71	75	80	83	85	72
Ghana	40	49	57	64	69	73	50
Greece	65	72	77	80	82	84	71
Grenada	62	64	69	76	79	81	59
Guadeloupe	52	65	74	80	82	84	
Guam	56	66	72	76	79	81	
Guatemala	42	52	62	71	75	78	57
Guinea	31	34	44	54	62	68	45
Guinea-Bissau	32	37	43	48	56	63	41
Guyana	48	56	61	70	75	78	55
Haiti	36	47	55	62	67	72	44
Honduras	41	52	66	73	77	79	58
Hungary	63	69	69	74	78	80	65
Iceland	71	74	78	82	84	86	73
India	37	49	58	65	70	74	53
Indonesia	37	52	62	69	75	78	58
Iran (Islamic Republic of)	36	51	62	73	77	79	58
Iraq	37	58	67	68	74	77	50
Ireland	65	71	75	80	83	85	70
Israel	68	72	76	81	85	87	71
Italy	65	71	77	82	84	86	73
Jamaica	57	68	71	73	76	78	65
Japan	60	72	79	83	86	88	75
Jordan	46	61	70	73	76	79	61
Kazakhstan	54	62	67	67	72	75	56
Kenya	42	52	59	57	64	69	44
Kuwait	54	67	72	74	77	79	67
Kyrgyzstan	52	60	66	67	72	75	55
Lao People's Democratic Republic	42	46	54	67	73	77	47
Latvia	65	70	69	73	77	80	63
Lebanon	54	65	69	72	76	79	60
Lesotho	41	49	59	48	54	59	31
Liberia	34	41	42	56	64	69	35
Libyan Arab Jamahiriya	42	52	68	75	78	81	64
Lithuania	64	71	71	72	76	79	63
Luxembourg	65	70	75	80	83	85	72
Madagascar	36	44	51	66	72	75	49
Malawi	36	41	47	54	61	67	35
Malaysia	54	64	70	74	77	80	63
Maldives	33	44	61	77	81	84	58
Mali	30	34	44	51	59	66	38

	Life expectancy at birth						Healthy life expectancy at birth
	1950	1970	1990	2010	2030	2050	2002
Malta	66	70	75	79	82	84	71
Martinique	54	66	75	80	82	84	
Mauritania	38	47	56	58	64	70	45
Mauritius	48	63	69	73	76	79	62
Mayotte	44	63	72	77	80	82	
Mexico	49	61	71	77	80	82	65
Micronesia (Fed. States of)	54	62	66	69	73	76	58
Mongolia	43	56	61	68	73	77	56
Montenegro	58	69	76	74	78	80	64
Morocco	42	52	64	72	76	79	60
Mozambique	30	39	43	50	58	64	37
Myanmar	33	50	57	65	72	76	52
Namibia	40	53	61	62	66	70	43
Nepal	36	43	54	68	74	77	52
Netherlands	71	74	77	81	83	85	71
Netherlands Antilles	58	69	75	77	79	81	
New Caledonia	49	63	71	76	80	82	
New Zealand	69	71	75	81	83	85	71
Nicaragua	41	54	64	74	77	80	61
Niger	37	38	41	54	62	68	36
Nigeria	35	42	46	51	59	66	42
Norway	72	74	77	81	83	86	72
Occupied Palestinian Territory	46	56	68	73	76	79	
Oman	37	51	71	73	76	79	64
Pakistan	40	53	61	65	69	72	53
Panama	54	65	72	76	79	81	66
Papua New Guinea	34	46	56	62	69	73	52
Paraguay	63	65	68	72	75	78	62
Peru	43	53	66	74	77	80	61
Philippines	55	61	65	68	73	77	59
Poland	59	70	71	76	79	81	66
Portugal	59	67	74	79	82	84	69
Puerto Rico	61	72	74	79	81	83	
Qatar	53	66	74	78	81	83	65
Republic of Korea	47	61	72	81	83	85	68
Republic of Moldova	57	65	68	69	73	77	60
Réunion	45	64	72	78	80	82	
Romania	60	68	69	74	77	80	63
Russian Federation	64	69	68	69	73	76	58
Rwanda	39	44	33	55	62	68	38
Saint Lucia	54	64	71	74	78	80	63
Saint Vincent and the Grenadines	52	61	69	72	75	78	61
Samoa	45	55	65	72	76	79	60
Sao Tome and Principe	46	55	61	64	69	73	54
Saudi Arabia	39	52	69	74	77	80	61
Senegal	36	41	53	59	65	70	48
Serbia	56	68	72	74	77	80	64
Sierra Leone	29	35	39	47	55	63	29
Singapore	58	68	76	81	83	85	70
Slovakia	62	70	71	75	78	81	66
Slovenia	64	69	73	79	82	84	69
Solomon Islands	44	54	57	67	73	77	56
Somalia	32	40	45	51	58	66	37
South Africa	44	53	62	52	59	65	44
Spain	62	72	77	81	84	86	73
Sri Lanka	51	63	70	75	78	80	62
Sudan	40	45	53	61	68	73	49
Suriname	55	63	67	70	74	77	59
Swaziland	41	48	59	48	54	63	34
Sweden	71	74	78	81	84	86	73
Switzerland	69	73	78	82	85	87	73
Syrian Arab Republic	46	60	71	76	79	81	62
Tajikistan	52	60	63	67	72	75	55
TFYR Macedonia	53	66	71	75	77	80	63
Thailand	49	60	73	74	77	80	60
Timor-Leste	29	40	46	62	70	75	50
Togo	34	45	53	57	64	70	45
Tonga	58	65	70	72	75	77	62
Trinidad and Tobago	57	65	69	70	74	77	62
Tunisia	44	54	69	74	78	80	62
Turkey	47	50	63	74	77	80	62
Turkmenistan	50	58	63	65	70	74	54
Uganda	39	50	47	54	60	66	43
Ukraine	64	71	70	68	73	76	59
United Arab Emirates	44	62	72	76	79	81	64
United Kingdom	69	72	76	80	82	85	71
United Republic of Tanzania	40	47	51	57	66	70	40
United States of America	68	71	75	78	81	83	69
United States Virgin Islands	57	68	75	79	82	84	
Uruguay	66	69	73	77	80	82	66
Uzbekistan	55	63	67	68	72	75	59
Vanuatu	41	52	63	71	75	78	59
Venezuela (Bolivarian Republic of)	53	64	71	74	77	80	64
Viet Nam	39	48	66	75	78	81	61
Western Sahara	35	42	58	67	73	77	
Yemen	35	40	56	65	72	76	49
Zambia	41	49	47	49	56	63	35
Zimbabwe	48	55	61	50	61	66	34

Biographies

Isabella Aboderin, Senior Research Scientist, African Population and Health Research Center, (APHRC) Nairobi, Kenya; Senior Research Fellow, Oxford Institute of Population Ageing, (OIA) University of Oxford, UK

BSc, Cellular and Molecular Pathology; MSc, Health Promotion Sciences; PhD, Social Policy Studies. Senior Research Fellow, conducting research and coordination of the Institute's African Research on Ageing Network (AFRAN), Oxford Institute of Population Ageing; Co-Coordinator, African Research on Ageing Network. Regional Chair for Africa, International Association of Gerontology and Geriatrics; Member, Advisory Board, World Demographic and Ageing Forum; Board Member Elect, HelpAge International; Member, African Union Working Group on Rights of Older People. Interests: ageing in Africa, intergenerational dynamics, ageing and development, social determinants of health in old age.

Giles Archibald, Senior Partner, Mercer (MMCo), United Kingdom

1973, degree in Mathematics, St Andrews University, Scotland. Since 1977, with Mercer including: international consultant and practice leader, Brussels, London and New York; currently, based in Manchester and London; consulted with US and UK multinationals. Frequent speaker at conferences on international benefits. Author of articles on worldwide employee benefits, including Retirement Benefits in Europe, a research paper for Faculty of Actuaries, focused on methods of benefit financing in France and Germany. Fellow, Faculty of Actuaries, UK. Associate, Society of Actuaries.

John Beard, Director, Department of Ageing and Life Course, World Health Organization (WHO), Geneva

MBBS; PhD. Physician. Formerly: worked in Aboriginal health; 1991, senior public health and academic roles, Australia; three years as Senior Epidemiologist, New York Academy of Medicine; US; since 2009, current position.

Simon Biggs, Professor of Gerontology and Social Policy, University of Melbourne, Australia

Formerly: Community Psychologist; Head of Policy Development, UK Social Work Education Council; Professor of Social Gerontology, Keele University; 2002, Visiting Research Fellow, Department of Social Medicine, Harvard University. Director, Institute of Gerontology, King's College London; since 2010, current position. Links with University of Helsinki and University of Heidelberg. Research includes: WHO's Age Friendly Cities Project; ESRC study of baby boomers; study of elder abuse in UK; intergenerational relationships; the mature workforce. Interests: relationship between identity and adult ageing, analysis of international/national social policy, adult life course, experience of ageing, lifestyle and self-development in later life, counselling, psychotherapy, and the baby boomer generation. Adviser to EC, Canadian, UK, Australian Govt Ministries. Author of books and papers; contributed to UN Valencia Forum and scientific debate in Europe and US.

Richard Blewitt, Chief Executive, HelpAge International, United Kingdom

Master's in African Politics and Economics. Formerly, leadership positions with: UN; International Red Cross; Save the Children. Interests: development economics, humanitarian response, human rights, building broad-based alliances and partnerships.

David E. Bloom, Clarence James Gamble Professor of Economics and Demography, Harvard School of Public Health, Harvard University, USA

1976, BSc in Industrial and Labour Relations, Cornell University; 1978, MA in Economics, Princeton University; 1981, PhD in Economics and Demography, Princeton University. Formerly: Assistant Professor of Economics, Carnegie-Mellon; Assistant and Associate Professor of Economics, Harvard; Professor and Chairman of Economics, Columbia. Chairman of Global Health and Population Dept, HSPH. Currently: Fellow, American Academy of Arts and Sciences. Faculty Research Associate, Labour Studies, Ageing, and Health Economics Programmes, National Bureau of Economic Research. Director, Harvard Program on Global Demography of Aging. Member, Board of Trustees: amFAR; PSI.

Axel Börsch-Supan, Director, Max Plank Institute for Social Law and Social Policy, Germany

PhD, MIT, US. Formerly: with faculties at Harvard, Dortmund and Dresden; consultant to governments, OECD and World Bank. Currently: Professor of Macroeconomics and Public Policy, and Director, Munich Center for the Economics of Aging, Max-Planck-Institute for Social Law and Social Policy, Germany; current research focuses on household retirement and savings behaviour, age and productivity, and Survey of Health, Ageing and Retirement in Europe; Research Associate, National Bureau of Economic Research, US; Adjunct Researcher, RAND Corporation, US. Member: German National Academy of Sciences; Berlin-Brandenburg Academy of Sciences; MacArthur Foundation Aging Societies Network. Former Chair, Council of Advisers, German Economics Ministry, co-chaired German Pension Reform Commission; former Member, German President's Commission on Demographic Change.

Raymond Brood, Director, Health and Benefits Benelux, Mercer (MMCo), Netherlands

Degree in Law, University of Rotterdam. Former Account Manager and worked the dealing room, ABN Bank. 1990, with AEGON, responsible for the client management activities of AEGON Asset Management, then started a new concept for AEGON's largest Insurance Intermediaries. 1996, joined MeesPierson (became Fortis in 1997): Board Member, Fortis Investments and responsible for commercial activities and client management of the asset manager, the ALM department and led the pension administration department. 1999, Chairman, Beijer Group (Intermediary Captive of Fortis). 2003, joined Mercer as Head, Group Benefits; 2005, appointed to the Dutch leadership group and the European H&B leadership group; currently, Senior Partner, Health & Benefits, Benelux; Member of the Benelux Leadership Team and European Health & Benefit Leadership.

Laura Carstensen, Director, Stanford Center on Longevity, USA

BSc, University of Rochester; PhD in Clinical Psychology, West Virginia University. Professor of Psychology and Fairleigh S. Dickinson Junior Professor in Public Policy, Stanford University. Founding Director, Stanford Center on Longevity. Author, with students and colleagues, of over 100 articles on life-span development. Author, A Long Bright Future: Happiness, Health, and Financial Security in an Age of Increased Longevity (2011). Research supported by National Institute on Aging for more than 20 years. Fellow: Association for Psychological Science; American Psychological Association; Gerontological Society of America. Member, Research Network on an Aging Society, MacArthur Foundation. Recipient of awards, including: Guggenheim Fellowship; Distinguished Career Award, Gerontological Society of America.

Norman Daniels, Mary B. Saltonstall Professor of Population Ethics; Professor of Ethics and Population Health, Harvard School of Public Health, USA

PhD. 1969-2002, Professor and former Chair of the Philosophy Department, Tufts University. Currently, Mary B Saltonstall Professor and Professor of Ethics and Population Health, Department of Global Health and Population, Harvard School of Public Health, directs the Ethics concentration of the Health Policy PhD and teaches courses on ethics and health inequalities and justice and resource allocation. Author of numerous books, including: Just Health: Meeting Health Needs Fairly (2008); Setting Limits Fairly: Learning to Share Resources for Health, 2nd edition (2008); From Chance to Choice: Genetics and Justice (2000); Is Inequality Bad for Our Health? (2000). Research is on justice and health policy, including priority setting in health systems, fairness and health systems reform, health inequalities, and intergenerational justice. Recipient, Everett Mendelsohn Award for mentoring graduate students.

Gerald C. Davison, Dean and Executive Director, University of Southern California Davis School of Gerontology and Andrus Gerontology Center, USA

1961, BA, Social Relations, Harvard; 1961-62, Fulbright Scholar, Univ. of Freiburg, Germany; 1965, PhD, Psychology, Stanford. 1966-79, Assistant Prof., State Univ. of New York, Stony Brook. With Univ. of Southern California: Prof. of Psychology; Chairman, Dept of Psychology; Interim Dean, Annenberg School of Communications; Interim Dean, School of Architecture; since 2007, current position. President, Society of Clinical Psychology, American Psychological Assoc. Fellow, APA; Charter Fellow, Assoc. for Psychological Science. Member, Gerontological Society of America. Dist. Founding Fellow, Academy of Cognitive Therapy. Publications emphasize experimental and philosophical analyses of psychopathology, assessment, and therapeutic change. Co-Author of Abnormal Psychology (2010). Research focuses on relationships between cognition and a variety of behavioural and emotional problems. Recipient of awards, including: Lifetime Achievement Award, Association for Cognitive and Behavioral Therapies (2006); USC Associates Award for Excellence in Teaching.

Mario Martin Delgado Carrillo, Minister of Education of Mexico City, Mexico

Bachelor's in Economics, Instituto Tecnológico Autónomo de México; Master's in Economics, University of Essex, UK. 2006, appointed by Mayor Ebrard Casaubon Minister of Finance for Mexico City. Developed one of the important programmes in education, Prepa Si, diminishing school desertion from 20% to 6% and benefiting more than 200,000 students. Promoter of the inclusion of gender, minorities and human rights into the City's budget, leading to the largest social agenda in the country. Led the renegotiation of the Federal District's debt for more than three billion dollars. Young Global Leader 2011. 2011, Member, Global Agenda Council on Skills and Talent Mobility, World Economic Forum.

Jack Ehnes, Chief Executive Officer, California State Teachers' Retirement System (CalSTRS), USA

Former: Colorado Insurance Commissioner and Deputy Insurance Commissioner; Chairman of the Board, Colorado Public Employees Retirement Association; Vice-President, Corporate Affairs, Great West Life and Annuity Insurance Company; Chairman, Council of Institutional Investors. Currently, Member of the Board: National Council on Teacher Retirement; National Institute on Retirement Security; International Foundation for Employee Benefit Plans; Ceres, a network of investors and environmental organizations focused on sustainability. Member, World Economic Forum's Global Agenda Council on Ageing.

Linda P. Fried, Dean and DeLamar Professor of Public Health, Mailman School of Public Health, Columbia University, USA

MD; MPH. Leader in the fields of epidemiology, gerontology and geriatrics. Scientist with expertise in healthy ageing, prevention of frailty, chronic diseases and disability, and creating the basis for a transition to an aging world that benefits all ages. Currently, Dean, DeLamar Professor of Public Health, and Professor of Epidemiology, Mailman School of Public Health, Columbia University; concurrently, Professor of Medicine, College of Physicians & Surgeons, Columbia. Co-Designer and Co-Founder, Experience Corps, a community-based senior volunteer programme that deploys the social capital of an aging society to improve the academic success of children in elementary schools while simultaneously promoting the health of the older volunteers. Member: Institute of Medicine, National Academy of Sciences; Global Agenda Council on Ageing, World Economic Forum. Recipient of numerous awards, including: APHA Archstone Award (2000); Irving Wright Award, American Federation for Aging Research; Living Legend in Medicine, US Congress; one of the Top 100 Women in Maryland; inaugural Silver Innovator Award, Alliance for Aging Research.

Aaron Hagedorn, Assistant Clinical Professor, University of Southern California (USC), USA

MS/MHA in Health Administration and Gerontology and PhD in Gerontology, University of Southern California. Currently, Assistant Clinical Professor, University of Southern California, Davis School of Gerontology, teaching courses and conducting research on healthy life expectancy, technological systems designed to support aging in place, and global health issues related to population aging. Member: Reves International Network on Health Expectancy; Gerontological Society of America; Population Association of America. Advisory Board Member, WISE Connections Aging in Place village project in Santa Monica, California.

Terry Hill, Chairman, Arup Group Trust, Arup Group, United Kingdom

Experience in civil engineering, economics, transport sector. 1976-96 and since 1999, with Arup: led Infrastructure Division, focusing on consulting, infrastructure and managing major projects. 1996-99, Director, Union Railways, responsible for technical aspects of Channel Tunnel Rail Link.

Paul R. Hogan, Chairman and Founder, Home Instead Senior Care, USA

1985, BSc, University of Nebraska. Over 20 years' experience in franchising. 1994, Founder, Home Instead Senior Care; 1998 and 2005, established two foundations caring for seniors and those who serve them; 2004, founding Member, National Private Duty Association; 2005, delegate to White House Conference on Aging; 2008, anchor donor, Home Instead Center for Successful Aging. Author, Stages of Senior Care. Recipient of awards: Entrepreneur of the Year, International Franchise Association (2006); E Award, US Department of Commerce (2008).

Emmanuel Jimenez, Director, Human Development, East Asia and Pacific Region, and Editor, World Bank Research Observer, World Bank, Washington DC

BA (Hons) in Economics, McGill University, Montreal, Canada; PhD in Economics, Brown University, US. Formerly, with Faculty, Economics Department, University of Western Ontario, London, Canada. Various positions with World Bank, including: Development Economics, managed staff and research including education and health finance, private provision of social services, economics of transfer programmes and urban development; 2002, Sector Director, Human Development, East Asia Region, responsible for managing operational staff working on education and health issues; member, formally and informally, teams preparing World Development Reports.

Alexandre Kalache, Senior Advisor, Global Ageing, New York Academy of Medicine, USA

1970, degree in Medicine; 1972, specialist in Tropical Medicine and 1974, diploma in Medical Education, Federal University of Rio de Janeiro; 1977, MSc in Social Medicine and 1993, PhD in Epidemiology, University of London; 1978, Fellow, Public Health, Royal College of Physicians, London. 1977-84, Clinical Lecturer, Public Health, University of Oxford; 1984-95, Senior Lecturer, Epidemiology of Ageing, London School of Hygiene and Tropical Medicine; 1995, Chief, Ageing and Health Programme, World Health Organization. Interests: public health and ageing populations; Latin American literature; development issues.

Randall Krakauer, National Medical Director, Medicare, Aetna, USA

1972, graduate, Albany Medical College; training in Internal Medicine, University of Minnesota Hospitals and in Rheumatology, National Institutes of Health and Massachusetts General Hospital/Harvard Medical School; MBA, Rutgers. Board Certified in Internal Medicine and Rheumatology. More than 35 years of experience in medicine and medical management, has held senior medical management positions in several major organizations. Professor of Medicine, Seton Hall University Graduate School of Medicine. Former Chairman, American College of Managed Care Medicine. Fellow: American College of Physicians; American College of Rheumatology. Responsible for medical management strategy and planning nationally for Aetna Medicare members, including programme development and demonstration of impact; has developed programmes that have had impact on chronic illness, advanced illness and major risk factors. Author of publications on Medical management, advanced care management and collaborative medical management.

André Laboul, Head, OECD Financial Affairs Division and Secretary-General IOPS, Organisation for Economic Co-operation and Development (OECD), Paris

Degrees from universities of Liège and Louvain-La-Nueve. Economist and a Lawyer. Formerly, in Belgium with Centre for European Policy Studies, Centre for Law and Economic Research (CRIDE) and Prime Minister Services for Science Policy. Currently, also: Secretary-General, International Organisation of Pensions Supervisors; Chair, International Network on Financial Education; Managing Editor, Journal of Pension Economics and Finance; Expert to European Commission group of experts on financial education. Wrote first major international studies on bank, insurance and on regulation of private pensions; instrumental in OECD development of international policy projects including financial education, terrorism insurance, financial management of catastrophic risks and financial risk transfers.

Ajay Mahal, Adjunct Associate Professor of International Health Economics, Harvard School of Public Health, USA

MA, MPhil, PhD. Former Associate Professor of International Health Economics, Department of Global Health and Population, Harvard School of Public Health. Currently, Finkel Chair of Global Health, Monash University, Melbourne. Research uses economic analyses to influence public health policy in developing countries. Research interests: policy issues related to the HIV/AIDS epidemic, resource allocation in the health sector, ageing, human resources and decentralization and empowerment. Current and ongoing work encompasses a wide range of topics, including: the growth of the medical education sector in India, and migration among India's medical graduates; diffusion of modern medical technology in India and other developing countries; the distribution of public sector health subsidies in India; health and support systems for the Indian elderly; economic analysis of injecting drug use behaviour; and the impact of HIV/AIDS in Botswana and Nigeria.

Patrick McGee, Senior Research Analyst, Global Agenda Councils, World Economic Forum

MA sociology. 2006-2007 Vice-President of the African Youth Association in Geneva. Since 2007 at the World Economic Forum, coordination of Global Agenda Councils related to human capital and demography, and programme development for the World Economic Forum on Africa. Advisory board member of the International Sport for Development and Peace Association.

Colin Milner, Founder, International Council on Active Ageing (ICAA), Canada

Since 1982, involved in health and wellness industry including, President, Idea Health and Fitness Association. 2001, established International Council on Active Ageing; advises: National Institute on Aging, US Department of Health and Human Services, European Commission, British Columbia Ministry of Health; Canadian Association of Fitness Professionals; Fitness Business Canada; Active Living by Design: Creating Activity-Enhancing Residential Settings work group; Active Living Leadership and Club Success; spokesperson on active aging for Canadian Association of Fitness Professionals. Author of over 200 articles on aging-related issues.

Jenifer Milner, Editor-in-Chief, Journal on Active Aging, International Council on Active Ageing (ICAA), Canada

Ten years' experience in the field of ageing. Former Communications Manager, Greater Vancouver Alliance for Arts and Culture, responsible for creating a series of widely published arts advocacy articles. Communications Specialist, Author and Editor-in-Chief, Journal on Active Aging, published by the International Council on Active Aging (ICAA) in Vancouver, Canada. Has also edited numerous publications, including Canada's national fitness business magazine, Club Direct.

S. Jay Olshansky, Professor, University of Illinois, USA

1984, PhD in Sociology, University of Chicago. Professor, School of Public Health, University of Illinois, Chicago; Research Associate, Center on Aging, University of Chicago and London School of Hygiene and Tropical Medicine; research focuses on estimates of upper limits to human longevity, exploring health and public-policy implications associated with individual and population aging, forecasts of size, survival and age structure of population, pursuit of scientific means to slow aging in people and global implications of re-emergence of infectious and parasitic diseases. Co-Author, The Quest for Immortality: Science at the Frontiers of Aging (2001).

Larry Rosenberg, Research Associate, Harvard School of Public Health, USA

Graduate, Kennedy School of Government, Harvard. Has worked on projects relating to health, education, demographic change, economic growth, poverty alleviation, social protection, tax policy, and the Israeli-Palestinian conflict. Currently, Research Associate, Harvard School of Public Health. Research interests centre on political and economic development in Latin America and Asia, focusing on steps developing countries can take that are distinct from those advocated by the international financial institutions.

John Rowe, Professor of Health Policy and Management, Mailman School of Public Health, Columbia University, USA

BS, Canisius College, Buffalo, NY; MD, University of Rochester, School of Medicine and Dentistry. Former Professor of Medicine and Founding Director, Division on Aging, Harvard Medical School, and Chief of Gerontology, Beth Israel Hospital. 1998-2000, President and CEO, Mount Sinai NYU Health. 2000-06, Chairman and CEO, Aetna. Professor, Department of Health Policy and Management, Columbia University Mailman School of Public Health. Former Chairman of the Board of Trustees, University of Connecticut. Former Director, MacArthur Foundation Research Network on Successful Aging; currently leads Research Network on An Aging Society. Member, Institute of Medicine, National Academy of Sciences; Fellow, American Academy of Arts and Sciences; Trustee, Rockefeller Foundation and Lincoln Center Theater. Chairman of the Board, Marine Biological Laboratory in Woods Hole, Massachusetts. Recipient of many honours and awards for research and health policy efforts regarding care of the elderly, including: Corporate Citizenship Award, Woodrow Wilson International Center for Scholars (2006); Honorary Leadership Award, American Federation for Aging Research (2008).

Daniel Ryan, Head, Research and Development for Life and Health, Swiss Re, United Kingdom

MA in Medical Sciences, University of Cambridge. Formerly: over 16 years as Research Consultant, Towers Watson; 2002-10, Founder and principal investigator for a multi-disciplinary research group for forum of insurers and re-insurers that used international data sources to investigate future possibilities for mortality and disease at all ages; 2006, Head, Mortality Research and Consulting. Since August 2010, with Swiss Re. Published actuarial papers on Continuing Retirement Care Communities, international mortality trends and forward-looking disease-based mortality models.

Leisa Sargent, Associate Professor, Faculty of Business & Economics, University of Melbourne, Australia

PhD, University of Toronto, Canada. Currently, Associate Professor, University of Melbourne, Australia. Research interests revolve around organizational and individual responses to change and transitions, with a particular interest in identity and careers.

Atsushi Seike, President, Keio University, Japan

1993, PhD, Labour Economics, Keio Univ. Former: Visiting Scholar, UCLA; Consultant, RAND Corp.; Visiting Principal Research Officer, Economic Research Institute, Economic Planning Agency. Since 1992, with Faculty of Business and Commerce, Keio Univ.: 2007-09, Dean; since 2009, President. Member of various councils, including: Labor Policy Council, Council on the Realization of the New Growth Strategy. Chairman, Policy Studies Group for an Aged Society. Member, Council for Intensive Discussion on Social Security Reform, and Reconstruction Design Council in Response to the Great East Japan Earthquake, Prime Minister's Office. President, The Japan Association of Private Universities and Colleges. Author.

Adam Stein, Undergraduate, University of Rochester, USA

Junior, University of Rochester, majoring in economics and applied mathematics. Adam spent the summer of 2011 working as a research assistant for the Department of Global Health and Population at the Harvard School of Public Health. While there, he co-authored the report "The Global Economic Burden of Non-communicable Diseases" with other researchers from Harvard and the World Economic Forum.

Kay Van Norman, Consultant and Author

Internationally known author, speaker and consultant specializing in adult wellness. Master's in Physical Education and Health. Seventeen years as Professor, Montana State University; also directed the Young at Heart exercise programme for older adults. Then Director, Keiser Institute on Aging, an international effort to bridge the gap between research and practice in the fields of gerontology, senior housing, fitness and older adult wellness. Founder and President, Brilliant Aging, a consulting firm specializing in improving older adult health, business development opportunities for companies interested in reaching older adult consumers, and employee wellness. Leading authority in senior exercise and wellness. Author of the book Exercise Programming for Older Adults, its revision Exercise and Wellness Programs for Older Adults (2010), and several book chapters. Also Author of dozens of journal articles, a national position paper for the White House Conference on Aging, and an issue brief for the National Council on Aging's Center for Healthy Aging.

John Wilden, Executive Director and Chief Executive Officer, Global Health Futures (GHF), United Kingdom

Qualified at the Royal Free Hospital, London. International career in neurosurgery, working in the UK and USA at prestigious institutions. main specialities in neurosurgery were in stereotaxis, brain tumours and head injuries. Performed the first MRI directed stereotactic procedure in the UK and was one of the first to indicate the importance of rapid resuscitation of severe head injuries in papers and presentations to international conferences including the American Association of Neurological Surgeons, the Congress of Neurosurgeons and a number of European academic bodies and organizations. Has served on international committees developing clinical trials in these disciplines. Co-Founder, Global Health Futures (GHF).

Ronald A. Williams, Chairman and Chief Executive Officer, RW2 Enterprises, USA

Graduate, Roosevelt University; Master's degree, Massachusetts Institute of Technology. Formerly: President, Large Group Division and President, Blue Cross of California, WellPoint Health Networks; Co-Founder and Senior Vice-President, Vista Health; Group Marketing Executive, Control Data; President and Co-Founder, Integrative Systems. 2006-2011, Chairman, Aetna. Chairman, Council for Affordable Quality Healthcare. Vice-Chairman, Business Council. Member of the Board: Trustees, Conference Board; Connecticut Science Centre; American Express; North America Executive, MIT. Member: Alfred P Sloan Management Society; International Federation of Health Plans. Since 2011 Current position.

Saadia Zahidi, Senior Director, Head of Constituents, World Economic Forum

BA (Hons) in Economics, Smith College; Master's in International Economics, Graduate Institute of International Studies, Geneva. With World Economic Forum: former Economist, Global Competitiveness Programme, responsible for economic analysis for the Global Competitiveness reports, Arab World reports and other topical and regional studies; currently, Head of Constituents, responsible for the engagement of religious leaders, NGOs, labour leaders, women leaders and gender parity groups; also leads research on gender issues. Founder and Co-Author, Global Gender Gap Report series, benchmarking countries according to the size of their gender gaps on health, education, economic participation and political empowerment.

Hania Zlotnik, Director, Population Division, Department of Economics and Social Affairs, United Nations, New York

Studies at Universidad Nacional Autónoma de México; PhD in Statistics and Demography, Princeton University. Experience in demography, covering analysis of fertility, mortality and migration with emphasis on quantitative aspects. Formerly: with Committee on Population and Demography, National Research Council, US. Since 1982, with Population Division, UN: 1993, Chief, Mortality and Migration Section in 1993; 1999; Chief, Population Estimates and Projections Section; 2003, Assistant Division Director. Vice-President, International Union for the Scientific Study of Population. Member, Population Association of America. Drafted UN recommendations on International Migration Statistics. Author and Editor, published over 35 articles in books. Expertise: demographic estimation techniques and international migration statistics.

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