Analyzing Population Aging from a New Perspective

Population aging is a major force reshaping economies and societies. New characteristic-based measures, developed at IIASA, provide a more accurate assessment of the challenges of population aging and the effects of policies to overcome them.

Summary

The populations of most countries are aging. This change presents societies with challenges both for public institutions and private entities. Tackling this requires a new approach, because conventional measures of aging are outdated, misleading, and do not take spatial and temporal variations in the characteristics of people into account. In this policy brief, we discuss how 21st century aging can be better addressed using 21st century tools.

■ **The Characteristics Approach** Taking the changing characteristics of groups of people, such as life expectancy and cognitive functioning, into account allows the construction of new, multidimensional measures of aging. These new measures provide novel perspectives on important policy questions.

■ **Defining "old"** The frequently used old-age thresholds of 60 or 65 are inconsistent with the new reality of people living longer and healthier. A better alternative is to define the onset of old age based on characteristics such as remaining life expectancy.

■ **More accurate measures of population aging** The most widely used measure of aging, the old-age dependency ratio, overestimates the consequences of aging. We show this by comparing this old measure with a new generation of measures such as (1) the ratio of adults not participating in the labor force to those who do, (2) a health care cost–dependency ratio that incorporates the fact that health care costs for elderly are highest during the final years of life, (3) a ratio that incorporates upward trends in pension ages, and (4) the ratio of adults who are old to those who are not, based on remaining life expectancy.

■ **An intergenerationally fair normal pension age** Fairness is a fundamental democratic value. Intergenerationally fair normal pension ages can be computed using the Characteristics Approach, and they ensure that the balance of pension contributions and receipts is the same for each generation, and that pension systems are flexible enough to adapt to changes.

■ **The trade-off between raising pension ages and labor force participation rates** Increasing labor force participation rates by reducing barriers for those who want to work would allow a slower rise in legal pension ages, without increasing the burden of supporting non-working adults.

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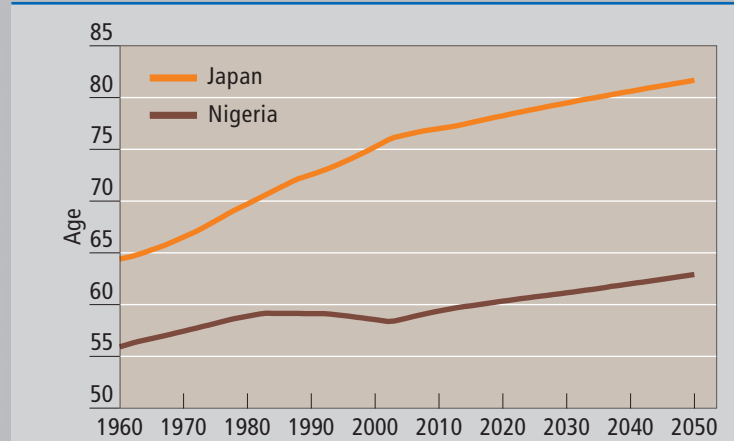
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Chart 1
Ages at which people have remaining life expectancy
of 15 years (both sexes combined).

Introduction

Population aging is reshaping economies and societies, and, as a result, it has prompted many international policy discussions. These discussions generally have taken place using concepts that are over a century old: the 'first-generation' approach to aging. The hallmark of this approach is that people are categorized as "old" or as "old-age dependents" when they reach some fixed chronological age, usually 60 or 65. An early statement of the UN, which uses this approach, can be found in the *Vienna International Plan of Action on Ageing* (1982):

> "In 1950, according to United Nations estimates, there were approximately 200 million persons 60 years of age and over throughout the world. By 1975, their number had increased to 350 million. United Nations projections to the year 2000 indicate that the number will increase to 590 million, […]."

A more recent UN publication, the *World Population Ageing 2015* report, states that:

> "[…] the number of older persons—those aged 60 years or over—has increased substantially in recent years in most countries and regions, and that growth is projected to accelerate in the coming decades.

> Between 2015 and 2030, the number of people in the world aged 60 years or over is projected to grow by 56 per cent, from 901 million to 1.4 billion, and by 2050, the global population of older persons is projected to more than double its size in 2015, reaching nearly 2.1 billion."

Although the numbers are different, the approach is the same in 2015 as it was over three decades earlier. People are still being classified as "old" at age 60.

This first-generation approach is problematic because the study of population aging should not be based only on chronological age, but on how well people function in society. There are people over the age of 100 who participate in sanctioned track and field competitions, and those over the age of 70 who climb Mount Everest. In the USA in 1994, 26.8% of men aged 65–69 participated in the labor force. By 2024, that percentage is forecasted to rise to 40% (www.bls.gov/emp/ep_table_303.htm).

Over time, the characteristics of people at each age change. In many places, 60 year olds in 2050 are likely to be much more educated, healthier, have better physical and cognitive functioning, and have a longer remaining life expectancy than 60 year olds living in the same area had had in 1950. Why, then, should policymakers treat them as being equally old, an equal burden on pension systems, and equally in need of care? When the characteristics of people change over time or differ in space, the first-generation measures produce misleading figures, and therefore suboptimal policies.

One of the most commonly used measures of population aging is the change in the "old-age dependency ratio." This ratio relates the number of "old-age dependents," who are assumed to be everyone 65+ years old, to those assumed to support them, people from 20–64. Many people are not getting the message that they are supposed to become "old-age dependents" on their 65th birthdays. Nevertheless, that message is unfortunately the basis of much of the policy discussion concerning population aging: a new approach is needed.

Defining age based on people's characteristics is a better approach

The 'second-generation' approach, based on characteristic-equivalent ages, produces new insights about differences between locations and over time.

Aging is a multidimensional phenomenon. Our approach is based on analysis of people's characteristics such as life expectancy, health and morbidity, disability, mortality rates, labor participation, and healthcare spending. For instance, in 2015, Japanese women aged 65 had a remaining life expectancy of around 24 years. In 1955, they had the same remaining life expectancy at around age 50. Nigerian women in 2015 had that remaining life expectancy at age 46. Therefore, 65 year old Japanese women in 2015, 50 year old Japanese women in 1955, and 46 year old Nigerian women in 2015 would have the same life expectancy-based age because they had the same number of years of life ahead of them. The concept of characteristic-equivalent ages lies at the heart of the second generation approach.
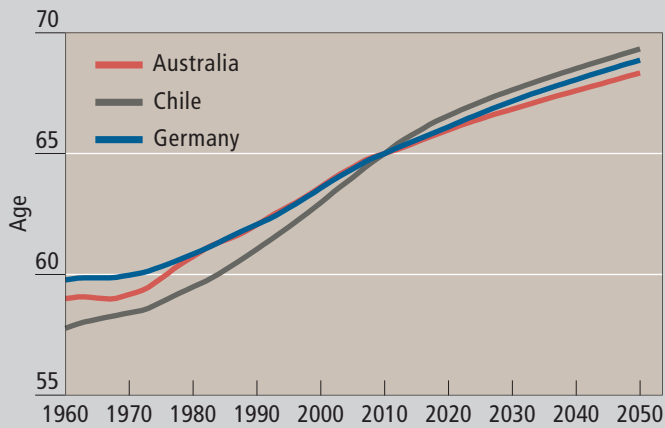
Chart 2
Intergenerationally equitable normal pension age
(standardized to Germany in 2010).

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Rethinking the definition of "old" is key to understanding 21st century population aging

Categorizing people as old based on a fixed chronological age is inappropriate both from a social and an economic perspective.

How old is "old" and what does it imply? We recommend a simple alternative to using 65 as the threshold of old age. Given the substantial variations in health and longevity, a better approach is to categorize people as "old" when they are getting close to the end of their lives. To make this clear, Chart 1 shows the chronological ages of people when their remaining life expectancy is 15 years. A 61 year-old Japanese and a 54 year-old Nigerian woman had a remaining life expectancy of 15 years in 1950, so, using our methodology, the threshold of old age in 1950 would be 61 in Japan and 54 in Nigeria. Old-age thresholds need to change over time and space according to the characteristics of people.

Accurate measures of population aging help tackle the challenges of demographic change

New and more accurate measures of aging can better inform demographic analysis and the public policy discussion.

Recently, new measures of population aging have been published, showing forecasts of:

1. The ratio of adults who are not in the labor force to those who are.

2. A new measure of the burden of healthcare costs that takes into account the fact that most of the healthcare spending on the elderly comes in the last few years of their lives.

3. A new measure of the burden of public pensions that takes into account the upward trend in full pension ages.

4. A measure of the ratio of adults who are old, according to our definition, to those who are not.

These new measures, available at www.reaging.org/indicators, present a very different picture of population aging than the first-generation measures. For example, the total dependency ratio, the ratio of those 0–19 and 65+ years old to those 20–64, is often used to portray the change in the burden of an increased number of non-working people on those who are working.

This first-generation measure ignores likely changes in labor force participation rates. Using predictions of labor force participation rates from the International Labour Organization, we forecasted the ratio of people who are not working to those who are. In Germany, the first-generation measure increases by 31% from 2015 to 2030 but our more accurate second-generation measure increases by only 11%. In Hungary, the first generation measure increases by 14% over the period, while our measure decreases by 1%.

Intergenerationally fair normal pension age for a sustainable future

Taking changes in life expectancy into account ensures a balance of pension contributions and receipts for generations to come.

In most wealthy countries, state pension arrangements are changing. Full pension ages are rising or changes which have a similar effect are being made in pension eligibility requirements. Pension arrangements differ by country. However, the Characteristics Approach can be used to compute an intergenerationally equitable normal pension age (IENPA) that takes changes in life expectancy into account. This is the age that ensures that the balance of pension contributions and receipts is the same for each successive generation (see Chart 2 for examples). It can serve as a standard against which to compare the paths of legislated future changes in full pension ages. In many countries, pension ages are planned to rise at about the same speed as the IENPA. This statistic helps policymakers see which countries have normal pension ages which are changing more rapidly or less rapidly than would be intergenerationally fair. Pension systems based on the IENPA are more sustainable than those that keep normal pension ages fixed.

Beginning with a normal pension age of 65, the IENPA in Germany rises to 67 in 2029. According to German law, the normal pension age will also increase to 67 by 2029, so the legislated increase in the German normal pension age and the increase in the IENPA are identical to 2029. Further increases in life expectancy of the elderly results in an IENPA of 69 in 2050. This information can be used in policy discussions about what the normal pension age should be after 2029. Having knowledge of the level and dynamics of an IENPA in a country can provide policymakers with a clear standard against which to assess existing policies and formulate new ones.

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A mix of increased pension ages and labor force participation rates will be best

Removing barriers for people who would like to work and creating incentives for people to stay in the labor force will help decrease the pension burden.

Increases in normal pension ages can be reduced without increasing the burden on working adults by increasing labor force participation rates. This can be a win–win policy because public policies sometimes keep some who want to work from doing so. Reducing these barriers can increase the wellbeing of those who want to work and simultaneously allow legal pension ages to rise more slowly. In many countries within the Organisation for Economic Co-operation and Development, an increase in the average labor force participation rate of 20–64 years old by 1 to 2 percentage points is all that is needed to enable policymakers to reduce the increase of the normal pension age by one year without increasing the burden of supporting the non-working population.

Conclusions

In studies of population aging people should not be categorized as "old" at age 60 or 65. Measures that do not take changing characteristics into account mislead policymakers. In particular, new policies on aging should incorporate some key aspects:

1. Categorize people as "old" when their remaining life expectancy is 15 years or less.

2. People with equivalent characteristics (such as life expectancy) should be treated as having the same characteristic-based age.

3. Conventional measures of population aging, based on fixed ages, should be retired. Alternative measures that incorporate changing characteristics are available at www.reaging.org/indicators, Table Re-aging 3.

4. Planned policy changes in normal pension ages should be compared with intergenerationally fair normal pension ages.

5. Policies should make it easier for older people who wish to work to do so.

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