

# NATIONAL LONGEVITY DEVELOPMENT PLANS: GLOBAL OVERVIEW 2019 (*First Edition*)



# National Longevity Development Plans

## Global Landscape Overview 2019: First Edition

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# National Longevity Development Plans

## Global Landscape Overview 2019: First Edition

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The background of the slide is a dark blue gradient. In the center is a large, semi-transparent image of the Earth, showing the continents of Africa and Europe. Overlaid on the Earth is a network of thin white lines and dots, suggesting a global communication or data network. The title 'Executive Summary' is centered in a large, white, sans-serif font. The entire content is framed by a thick, yellow, L-shaped border that appears to be made of two perpendicular bars meeting at the corners.

# Executive Summary





## Report Purpose and Scope

The present report delivers a comprehensive international overview of the projects, initiatives and efforts that different countries across the globe are making in order to combat the issues associated with ageing populations and to promote the extension and maintenance of their citizens' Healthy Longevity.

It offers comprehensive profiles of relevant initiatives in the UK, Israel, the Netherlands, Switzerland, Spain, Singapore, Hong Kong, South Korea, Japan, China, the USA and the European Union, and utilizes analytical metrics to compare the overall strength, focus, proactivity and relevance of their projects to the problems of an ageing population and the opportunity of Healthy Longevity.

Notably, the report finds that the United Kingdom comes out in the #1 position according to this proprietary comparative analysis, validating the conclusion (highlighted in Aging Analytics Agency's previous UK-focused regional case studies) that the nation is in position to become a leader in Healthy Longevity, and to deliver tangible benefits to its citizens through the prioritization of Healthy Longevity as a key component of its national strategic agenda, such as increases in its nationwide Health-Adjusted Life Expectancy (HALE) and a reduction in the economic burden posed by its ageing population.

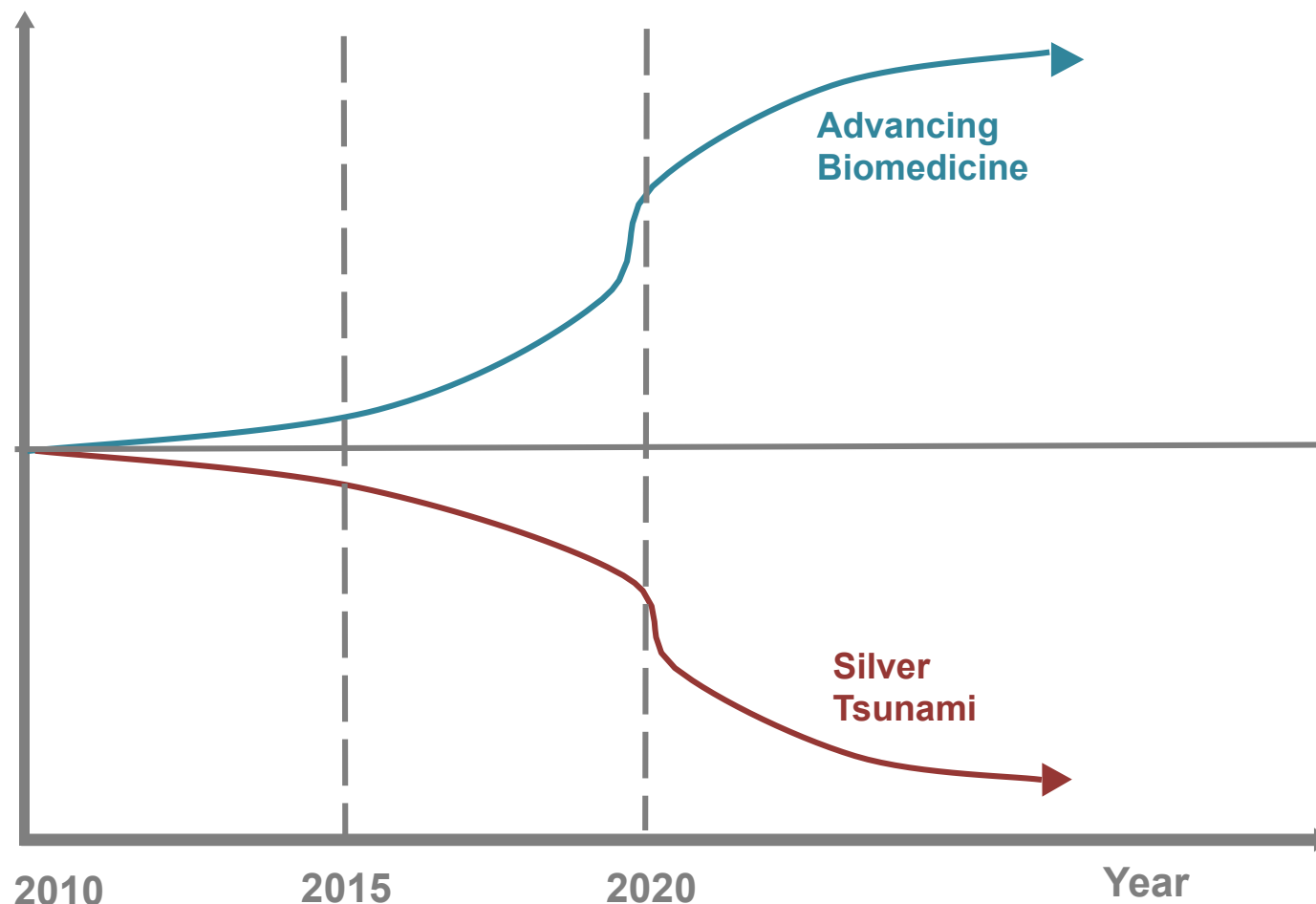
The report also examines how the nation could most successfully build upon its existing efforts in this direction, such as its listing of the 'Ageing Population' as one of its four core Industrial Grand Challenges, and the allocation of £300 million to promote industry efforts focused on securing the nation's position as the world leader in Healthy Longevity. While this leadership potential was arguably apparent even prior to the production of this report, the novel analytical approaches used in assessing the strength of various nations' Longevity development initiatives validate this notion quantitatively for the first time.

Furthermore, the report identifies important next steps that the UK government can execute in order to translate its efforts into tangible deliverables like increased healthy life expectancy and a thriving Longevity financial industry.



## Silver Tsunami

The present moment in history is marked by the impending collision of two opposed megatrends: 1) **advances in biomedicine** with the potential to target the fundamental mechanisms of ageing at their source, with the potential to increase Healthy Longevity, and 2) a rapid global population aging, also known as the “**Silver Tsunami**”, which threatens to impose a massive economic burden through increased healthcare costs combined with a shrinking workforce.



Globally, the number of over 65s is projected to almost double over the next 20 years, from around 600 million to more than 1 billion. This is basically the result of a combination of increasing life expectancy and decreasing fertility rates. Most consequences tend to be bleak - a growing proportion of dependents rely on a shrinking working population.

This leads to slower growth, exorbital pension costs, and, ultimately, an economy buckling under the weight of growing social and health care demands. This global demographic shift is known colloquially as the 'silver tsunami.'



## Scope and Diversity of Government Initiatives

In recent years we have been seeing increasingly frequent references to the 'ageing society' in official government initiatives around the world. At every layer of government planning, ranging from ad hoc projects such as municipal plans to grand industrial strategies, the ageing society is cited as a challenge to be overcome.

Different governments offer a myriad of ad hoc solutions for adapting to the demographic crisis.

We have seen **Lifestyle and Fitness Programs** such as Japan's plans for an Ageless Society, whereby people aged 65 or older will not be automatically regarded as seniors but will be encouraged to stay healthy and work, remaining economically active.

We have seen **AgeTech** programs, such as the Singapore Government's initiatives focused on smart-homes to improve elderly quality of life and wellbeing, and increasing their digital literacy.

We have seen **residential master plans**, such as the Seoul metropolitan government's "2020 Master Plan for the Aged Society" embracing the vision of Seoul as "a city whose citizens enjoy healthy and active lives of up to 100 years" under the banner of an "age-friendly city".

We have seen initiatives for a **preventive medicine** approaches to ageing, such as the UK's genomic medicine service and Swiss Personalised Health Network.

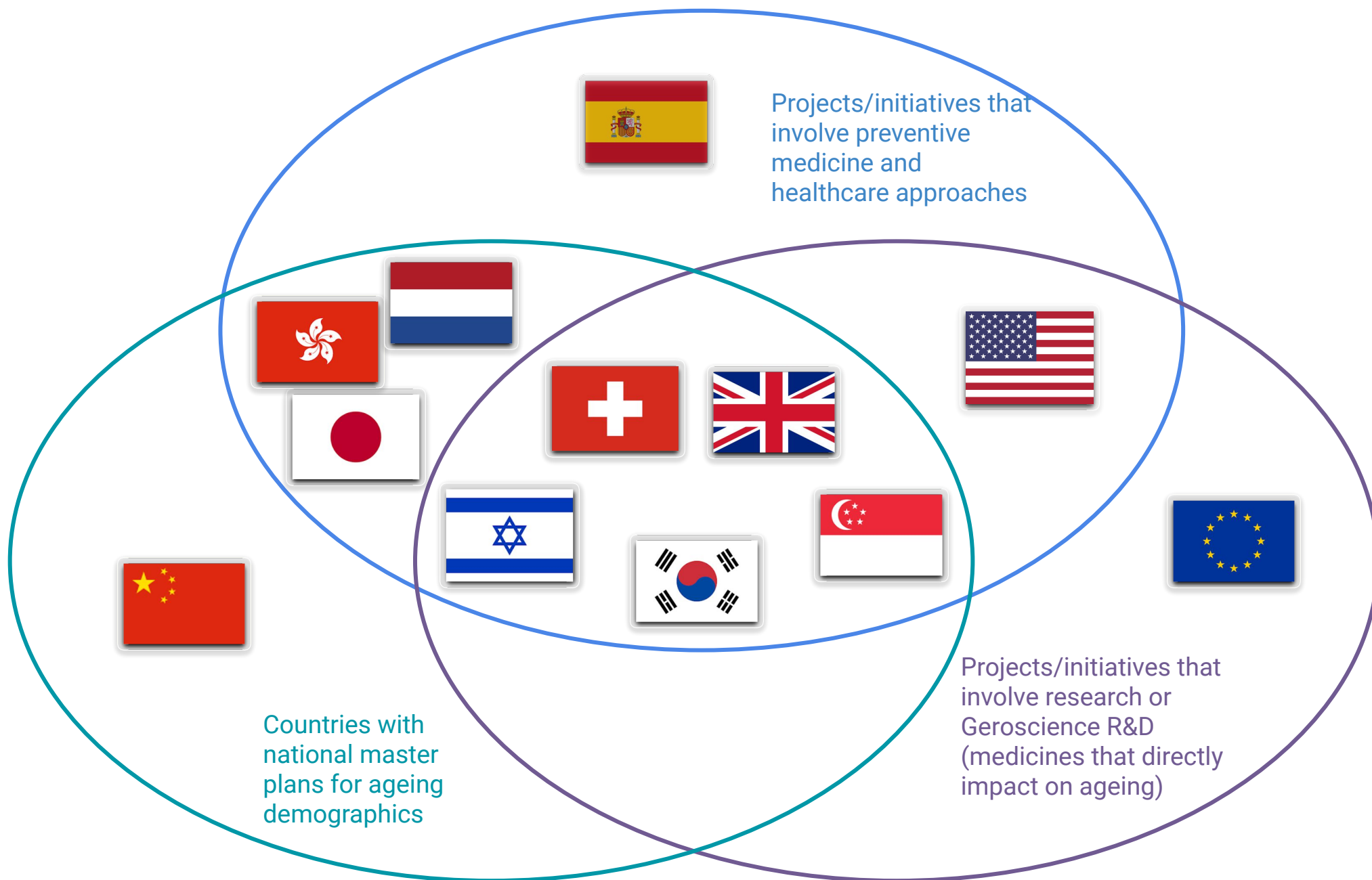
We have seen initiatives for intervening even further upstream, in the biology of ageing itself, with **geroscience** initiatives such as the Netherlands' Deltaplan for Dementia and Switzerland's Masterplan for the Promotion of Biomedical Research, and BIRAX Ageing, the joint UK-Israeli geroscience research initiative.

We have even seen **financial innovations** such as the Swiss City of St Gallen's elderly bank, where retired volunteers "deposit" hours worked looking after elderly people (and in return can use any time saved up for their own care provision later in life).





# Longevity Initiatives Classification Framework





We can see these diverse instances of government initiatives cropping up around the world in response to the looming tsunami. Each such initiative covered in this document involves at least one of the four key technological components which Aging Analytics Agency has identified in previous reports as comprising a Longevity Industry: **Geroscience Research and Development, Preventive Medicine, AgeTech, and Novel Financial Systems.**

Only through a dedicated, synergetic focus on all four of these domains at once can the global population be escorted to a longer and healthier life, and Healthy Longevity made into an asset. In other words, withstanding the global silver tsunami requires a coordinated strategy for advancing all four technological strands in synergy, with a heavy focus on novel financial reform to combat the economic burden of ageing population, and on furthering progress in advanced biomedicine to maximize Healthy Longevity. Unfortunately, no such nation-level Longevity development strategy exists. But we see the rudiments of it in the UK's existing initiatives, which lay a good foundation for the development of such a plan, having taken several crucial early steps:

- The UK has recognized an "ageing society" as one of its 4 core industrial grand challenges, and allocated £300 million to overcome this challenge, out of which goes £98 towards "Healthy Ageing Industrial Strategy Challenge Fund."
- This £98 million will drive the development of new products and services which will help people to live in their homes for longer, tackle loneliness, and increase independence and wellbeing.
- The UK has allocated £210 million towards "Data to early diagnosis and precision medicine programme."
- The Centers of Excellence in Genomic Science (CEGS) program, which aims to develop novel and innovative genomic research projects using the data sets and technologies developed by the Human Genome Project.
- Innovate UK's Digitalisation of Medicines Manufacturing Challenge Fund.
- In June 2018 Theresa May announced a commitment to harness AI to provide five more years of healthy independent lives by 2035.



Reviewing these initiatives, we can see that The United Kingdom has already turned its attention to cross-sector collaboration, particularly between artificial intelligence and healthcare. There has also been a general recognition of the central role of technology, and financial technology in particular, in improving the lives of the elderly.

However, there is no explicit intention of directing these agendas toward improving Healthy Longevity as a metric in itself yet. If the UK Government wants to optimise its existing initiatives for solving the ageing population problem, it must create a veritable Industry of Healthy Longevity itself, which in turn requires:

- A greater focus on promoting biomedical innovations focused on extending Healthy Longevity, and on financial reform to neutralize economic risks posed by an ageing society.
- A greater focus on combining these technologies in order to meet strategic goals. For example, it is not clear how much the UK government knows about the impact of its own biomedical initiatives on the 'ageing society' grand challenge.

Existing efforts must be extended to create a framework for **changing the deficit model of the 'Ageing Society' to an asset model around 'Longevity'**. And to be bold with a national strategy to harness the 'Longevity Dividend' to benefit all people in the society. In other words, we need a fully integrated **Longevity National Development Plan**. This requires intelligent coordination, which, in the British political tradition, means a governing body equivalent to the UK's recently created Office for AI.

**Development of a Blueprint and Framework for a Government-led National Longevity Development Strategy is one of the core aims of the recently established All-Party Parliamentary Group on Longevity and its secretariat company, Longevity International UK.**





## Report Structure

The purpose of this report is to offer an overview of government initiatives from around the world which were enacted in recognition of the demographic challenge each country faces.

It is our hope that documenting and assessing government initiatives may offer the British government some idea of the building blocks available for the construction of what could become the world's first Longevity National Development Plan.

We also aim to demonstrate how far the UK is already ahead of the game in this regard, and is therefore, the cradle of the fourth industrial revolution.

The chapter titled **Infographic Summary** identifies the broad categories of a government initiative to be considered: different orders of magnitude ranging from small municipal programs to national industrial strategies; and the different areas of intervention, from the financial to the biomedical.

This chapter also visualizes a number of data relevant to each country's current challenges and opportunities relating to Healthy Longevity and Ageing Population, ranging from healthcare expenditure and efficiency, gaps between their Health-Adjusted Life Expectancy (HALE) and standard life expectancy, projected dates of insolvency for state-funded pensions systems and social security systems, etc.

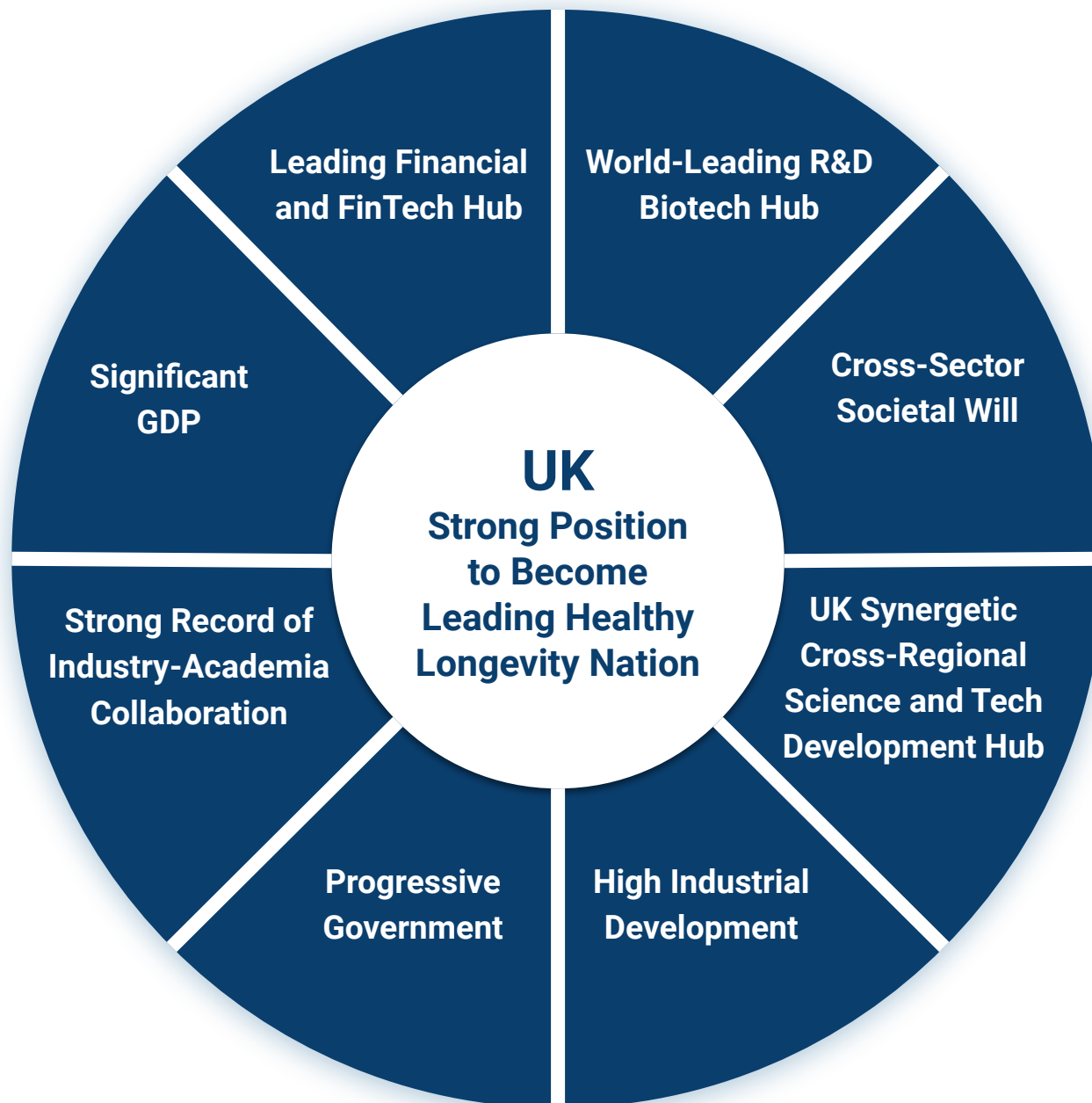
The chapter titled **Report Methodology** describes in detail the methods for evaluating various initiatives and ultimately ranking countries according to how close they come to executing actionable developments with a practical impact on ageing population. As such, our analysis also includes the final ranking of twelve countries according to the strength and relevancy of their Government-led ageing and Longevity-related projects and initiatives, as well as their likelihood of achieving tangible deliverables such as increases in Healthy Longevity, and decreases in the economic burdens posed by ageing populations.



The subsequent chapters serve as an overview of government initiatives from various countries which are contending with the silver tsunami in their own way, ranging from:

- **Young parliamentary democracies** with limited histories of government programs such as Spain and the EU, which produce government initiatives for the elderly in abundance but show little concerted effort for bringing about comprehensive solutions for dealing with the demographic crisis, and instead produce a succession of short-term plans and ad hoc regulations in order to ameliorate the experience of their ageing societies.
- **Technocratic tiger economies** such as Singapore, Hong Kong and South Korea. These countries tend to resemble what this report series has defined as longevity-progressive countries : small technocratic countries with ageing populations, who are therefore galvanised to produce coordinated solutions. We can observe in these countries big quantity of ageing initiatives. However, the budgets of these initiatives is much smaller than the one of big countries. Also, these countries have begun implementing their initiatives comparatively recently - from 12 years in Singapore to 20 years in Hong Kong.
- **Strong and established parliamentary democracies** such as UK and Japan. These are the states that have been facing the challenge of longevity for some time already and already making an effort to see the dividend in longevity and overcome the demographic challenge. Moreover, they have already demonstrated the political will for developing bold industrial strategies. This combination of factors puts them a cut above the tiger economies. The main challenge for these countries currently is continuing to assure consistent policy in this area, as well as continuing to innovate.

# UK in Leading Position to Become International Leader of Healthy Longevity



The UK is very well positioned to become a leader in Healthy Longevity, and was ranked #1 by this report's proprietary analysis for a number of reasons including its strong reputation as a BioTech R&D and Financial Hub, a strong history of industry-academia partnerships focusing on scientific and technological synergies, and its commitment of 300 million pounds to its Ageing Population Industrial Strategy Grand Challenge. The nation has all necessary compounds in place to leverage and channel its existing strengths into an efficient government-led campaign to make the promotion of Healthy Longevity and financial reform to neutralize the economic burden of an Ageing Population a key priority of its national strategic agenda.



# The All-Party Parliamentary Group on Longevity

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## All Party Parliamentary Group for Longevity



Preventive Medicine  
Innovations in Healthcare  
Problem of Ageing Population  
Financial Reform for Pension System



[www.parliament.uk](http://www.parliament.uk)

**LongevityUK**  
[www.longevityinternational.org](http://www.longevityinternational.org)

## Supporting Partners



## APPG for Longevity Officers



Rt Hon Damian  
Green MP  
Chair



Rt Hon Norman  
Lamb MP  
Vice-Chair



Sir Peter  
Bottomley MP  
Vice-Chair



Jonathan Lord MP  
Vice-Chair



Kevin  
Foster MP  
Vice-Chair



Lord Andrew Stone  
Secretary



Baroness Sally  
Greengross  
Treasurer



Lord Geoffrey Filkin

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CEO & Co-Founder  
Secretariat Director



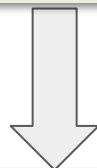
Dmitry Kaminskiy  
Head of International  
Cooperation Division



## Q3 2019: Longevity Development Plans Global Landscape Overview Second Edition, and Cross-Sector Longevity in UK Special Case Study

15

### National Longevity Development Plans Global Landscape Overview 2019 **Second Edition**



- A greater number of countries in its analysis.
- A wider variety of metrics (including a precise formulation for sub-metrics, metric categorization and metric weighting).
- Detailed project and initiative budget data analysis.
- Upgraded overall breadth and depth of the proprietary analysis for ranking the strength, relevance and proactiveness of Government Longevity initiatives.

### Longevity in UK Cross-Sector Comparative Analysis **Special Case Study**



- Enhanced comparative analysis of the UK Longevity sphere across many domains including Government initiatives, Longevity industry developments, science, academia, etc.
- Advanced analysis to determine precisely how the UK is positioned within the broader global Longevity sphere across many relevant sectors and domains.



## Conclusions

We can already see a broad spectrum of government initiatives from around the world focusing on ageing and Longevity. Some have a more biomedical focus, some a more digital focus. Some are national and some municipal. This all depends the economic and technological conditions and political traditions of each nation. But more importantly, some government initiatives are more integrated, comprehensive and long termist than others, with a varying degrees of emphasis on economic and industrial planning. **In this respect, some nations are closer than others to developing a fully integrated long term national development plan for longevity.**

Progress in this direction requires political will. And as the variety of British government initiatives listed here demonstrates, there is no shortage of political will to address the ageing population challenge in the UK. This is one factor that has resulted in the UK being ranked as #1 in terms of the strength and relevancy of its Government-led Longevity initiatives among the twelve regions profiled in this report.

However, while the UK has been shown to be a leader in this sphere, there are still important next steps that it can take in order to optimize the actionability of its ageing and Longevity-related development activities, and to maximize the chances of delivering tangible deliverables as a result, such as an increase in the nation's Healthy Longevity, and a reduction in the economic burden posed by its ageing population.

More specifically, it is the recommendation of this report that the UK Government work towards extending its existing efforts by developing a framework to change the deficit model of the 'Ageing Society' to an asset model around 'Longevity' and be bold with a national strategy to harness the 'Longevity Dividend' to benefit all people in society. In other words, the nation needs a fully integrated Longevity National Development Plan.

To this end, the development of a Blueprint and Framework for a Government-led National Longevity Development Strategy is one of the core aims of the recently established All-Party Parliamentary Group on Longevity and its secretariat company, Longevity International UK, for which Aging Analytics Agency is the main source of analytics.



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# Infographic Summary



# Ranking Countries on the Strength, Scope and Relevance of their Government Longevity-Related Projects and Initiatives

POSITION	COUNTRY	COUNTRY SCORE
1	United Kingdom	5.29
2	Netherlands	4.36
3	Singapore	4.15
4	South Korea	4.00
5	Israel	3.94
6	Switzerland	3.93
7	Hong Kong	3.41
8	Japan	3.10
9	USA	3.07
10	Spain	1.94
11	European Union	1.88
12	China	1.85



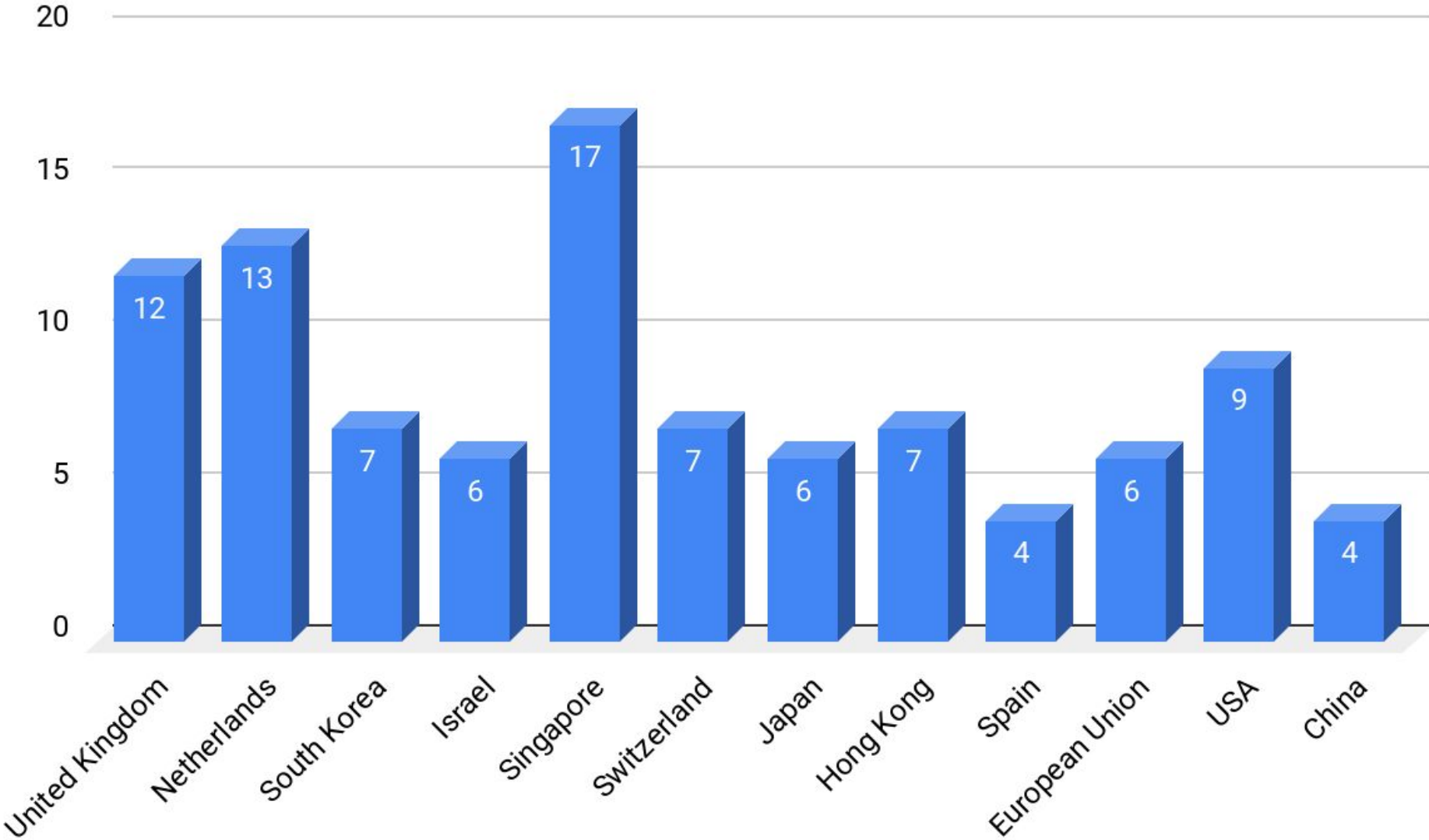
# Scale and Scope of Government Longevity Development Plans

Some government programs are more integrated than others, some showing more leadership than others in the industrialization of longevity. In this respect, the examples in this document fall into 3 main categories: **independent or municipal programs**, one plan per project (ad hoc) or per city, **national or metropolitan master plans** which bring together multiple sectors of government, and **industrial strategies** which include the use of research and development in pursuit of future economic dividends of Longevity. The next step is the **Longevity Industry Strategy**.



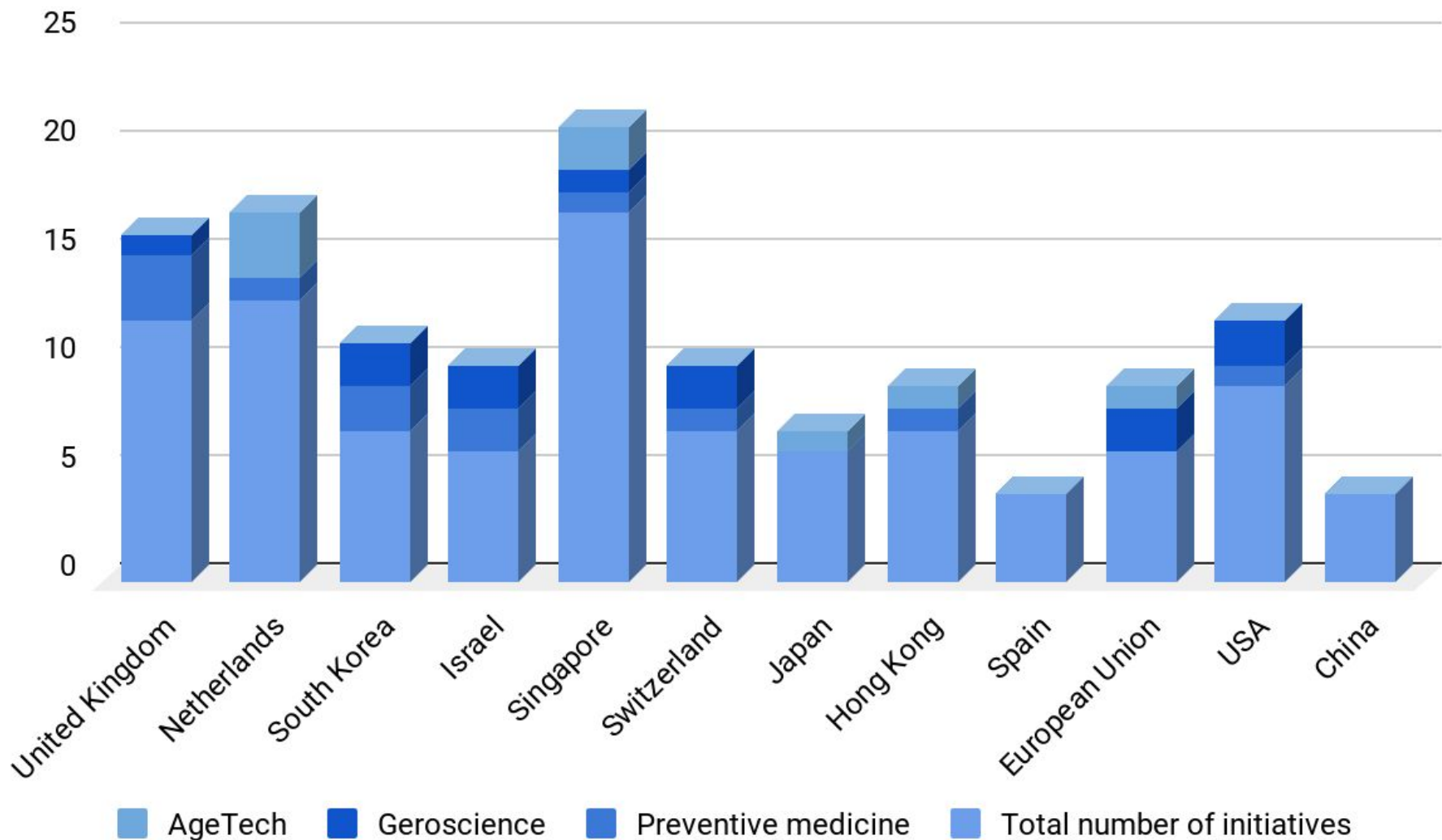


# Total Number of Government Led Longevity Initiatives





# Specialized Government Led Longevity Initiatives

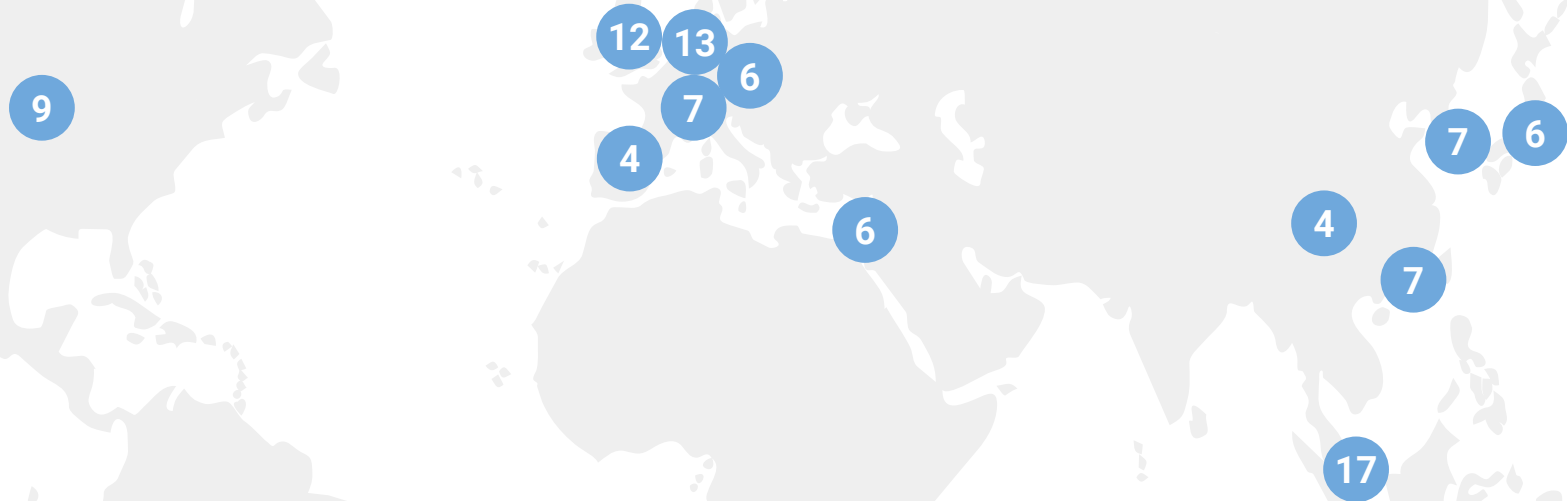




Represented here is the total number of relevant initiatives in the UK, the Netherlands, South Korea, Israel, Singapore, Switzerland, Japan, Hong Kong, Spain, the European Union, the USA and China.



# Number of Government Led Longevity Initiatives

22



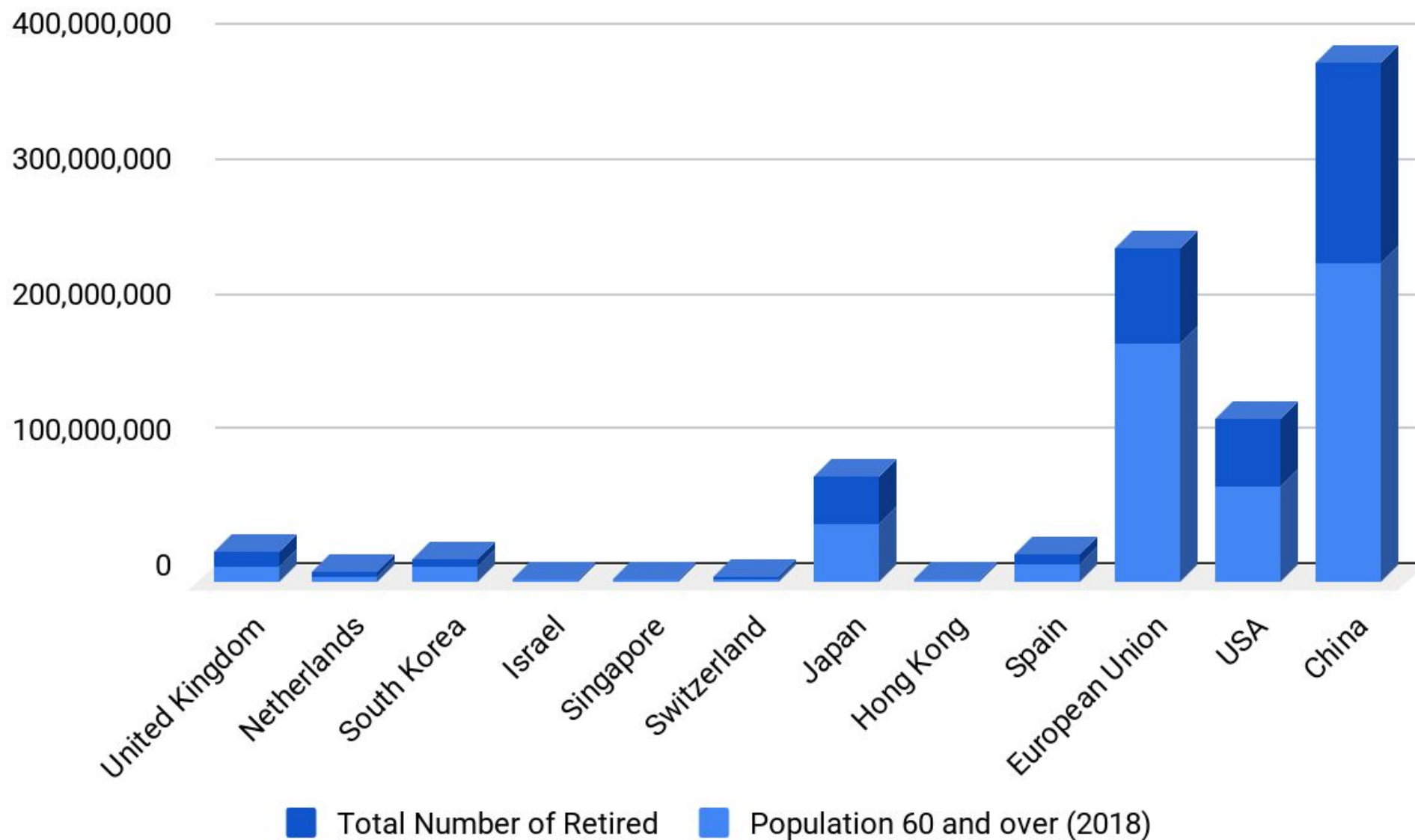
-  Number of initiatives focused on non-medical approaches that improve the quality of life
-  Number of initiatives focused on preventive healthcare, geroscience and AgeTech

<div><div>8</div><div>4</div></div> UK	<div><div>4</div><div>0</div></div> Spain	<div><div>2</div><div>4</div></div> Israel	<div><div>13</div><div>4</div></div> Singapore	<div><div>5</div><div>2</div></div> Hong Kong	<div><div>4</div><div>3</div></div> Switzerland
<div><div>4</div><div>0</div></div> China	<div><div>5</div><div>1</div></div> Japan	<div><div>3</div><div>4</div></div> South Korea	<div><div>9</div><div>4</div></div> Netherlands	<div><div>6</div><div>3</div></div> USA	<div><div>4</div><div>2</div></div> EU





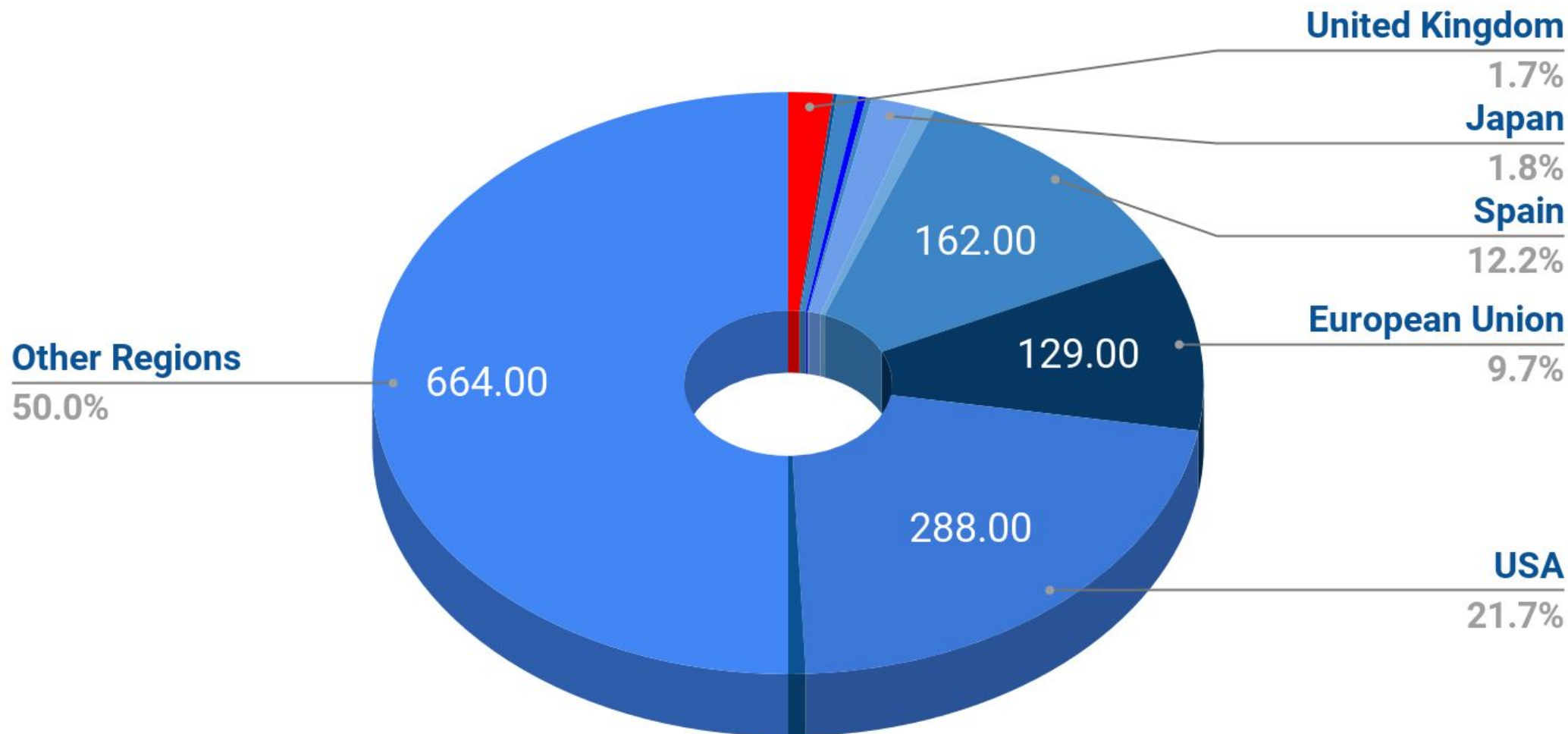
# Population 60 and Over (2018) and Total Number of Retired (*millions*)





# Number of Age Friendly Cities and Communities

Total number - 847 age friendly cities



This diagram represents the countries with the biggest number of WHO Age-Friendly cities. The number of cities for the European Union does not include countries mentioned in this report.



# Age-Friendly Cities and Communities



162	Spain
24	Japan
23	UK
11	South Korea
9	China
9	Hong Kong
4	Israel
3	Switzerland
2	Netherlands

319 out of 833 of WHO age-friendly cities and communities are located in Europe. Among them, 162 are in Spain. Other countries, including ones located in Asia, contain significantly less number of WHO age-friendly cities/communities.

**Some of these age-friendly, such as Seoul in South Korea or Akita in Japan, are the products of detailed government master plans.** Such master plans are recorded as instances of government initiatives in this document.



# Life Expectancy and GDP per Capita

26

GDP per capita (USD), 2018

Life expectancy, 2019

82.41



Switzerland

81.8

65.63



Singapore

85.7

64.77



USA

79.4

53.02



Netherlands

81.6

50.54



Hong Kong

82.7

42.31



United Kingdom

81

42.14



Israel

81.8

41.02



Japan

85.8

36.54



European Union

78.5

31.94



South Korea

80.9

30.63



Spain

81.9

10.15



China

75.9

Sources:

[World Economic Outlook](#)

[Geoba.se - Life Expectancy](#)



# Health Expenditure and Health Care Efficiency Score

27

Health expenditure (% of GDP), 2017

Health Care Efficiency (Bloomberg), 2018

17.2		USA	29.6
12.3		Switzerland	58.4
10.7		Japan	64.3
10.1		Netherlands	50.8
9.6		United Kingdom	58.9
8.8		Spain	69.3
7.6		South Korea	67.4
7.4		Israel	67
6.2		Hong Kong	87.3
2.2		Singapore	85.6
1.75		China	54

Sources:

[OECD.Stat - Health Status](#)

[Bloomberg Health Care Efficiency](#)

# Industrial Strategies, National Master Plans, Independent or Municipal Government Programs

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BIRAX Ageing

BIRAX Ageing



Society 5.0  
ソサエティ

Society 5.0



SEOUL METROPOLITAN  
GOVERNMENT



Seoul Metropolitan Government, South Korea  
ministry of Health and Welfare



CHARLS  
中国健康与养老追踪调查



北京大学  
PEKING UNIVERSITY

China Health and Retirement Longitudinal Study  
led by Peking University



NPTD  
NATIONAL POPULATION AND TALENT DIVISION  
"People's Ministry's Office"



Silver  
Infocomm

National Population and Talent Division, Modern  
ageing Incubator, Silver Infocomm Junctions

**National Master Plans**



INDUSTRIAL  
STRATEGY

UK Research  
and Innovation

Industrial Strategy Challenge Fund

UK Research and Innovation, UK Industrial  
Strategy, Industria; Strategy Challenge Fund

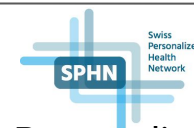
**Industrial strategy**



OAA  
OLDER AMERICANS ACT



Older Americans Act,  
The Building Our Largest Dementia,  
Affordable Care Act.



Swiss Personalized Health  
Network



衛生署  
Department of Health



勞工處  
Labour Department

Department of Health, Labour  
Department, The Hong Kong  
Council of Social Service



Durango, Age-Friendly City



Groningen Active Ageing Strategy,  
HANNN, Deltaplan for Dementia.



**Independent or  
Municipal Government Programs**



# Ratio of Population over 65 vs. the Age of Relevant Initiatives

Population over 65, %, 2018

Age of Relevant Initiatives

28.3		Japan	8
19.1		The Netherlands	12
18.8		Singapore	12
18.5		The United Kingdom	14
18.3		Switzerland	15
18.2		Spain	18
17.4		Hong Kong	20
15.6		USA	55
14.2		South Korea	9
11.9		China	40
11.7		Israel	40

The financial condition of a few governments' retirement programs is shaky, with projected insolvency of some schemes. There is a sobering picture for the **U.S. Medicare and Social Security** programs are headed toward **insolvency** by 2026 and 2035 respectively. **Spain's Social Security Reserve Fund** had run out of money by 2018 which only added to concerns over Spain's financial situation. Increasing longevity, low-interest rates, and an unstable global economy are the reasons why South Korea's National Pension Service is expected to run dry by 2056. The China Academy of Social Sciences reported that **China's pension funds** could become **insolvent by 2035**, with a rapidly dwindling workforce unable to support the growing number of elderly people. The second pillar of **Switzerland's** pension system is under **severe pressure**, and pension schemes are projected to go down by 2025, with failed main reform proposal that was rejected in a public referendum.

To assess pension systems in other countries, the **Melbourne Mercer Global Pension Index 2018** was used. The Index shows that the **Netherlands** offer A-Grade world-class retirement income systems with good benefits - clearly demonstrating their **preparedness for tomorrow's ageing world**.

Source: [Mercer Global Pension Index](#)

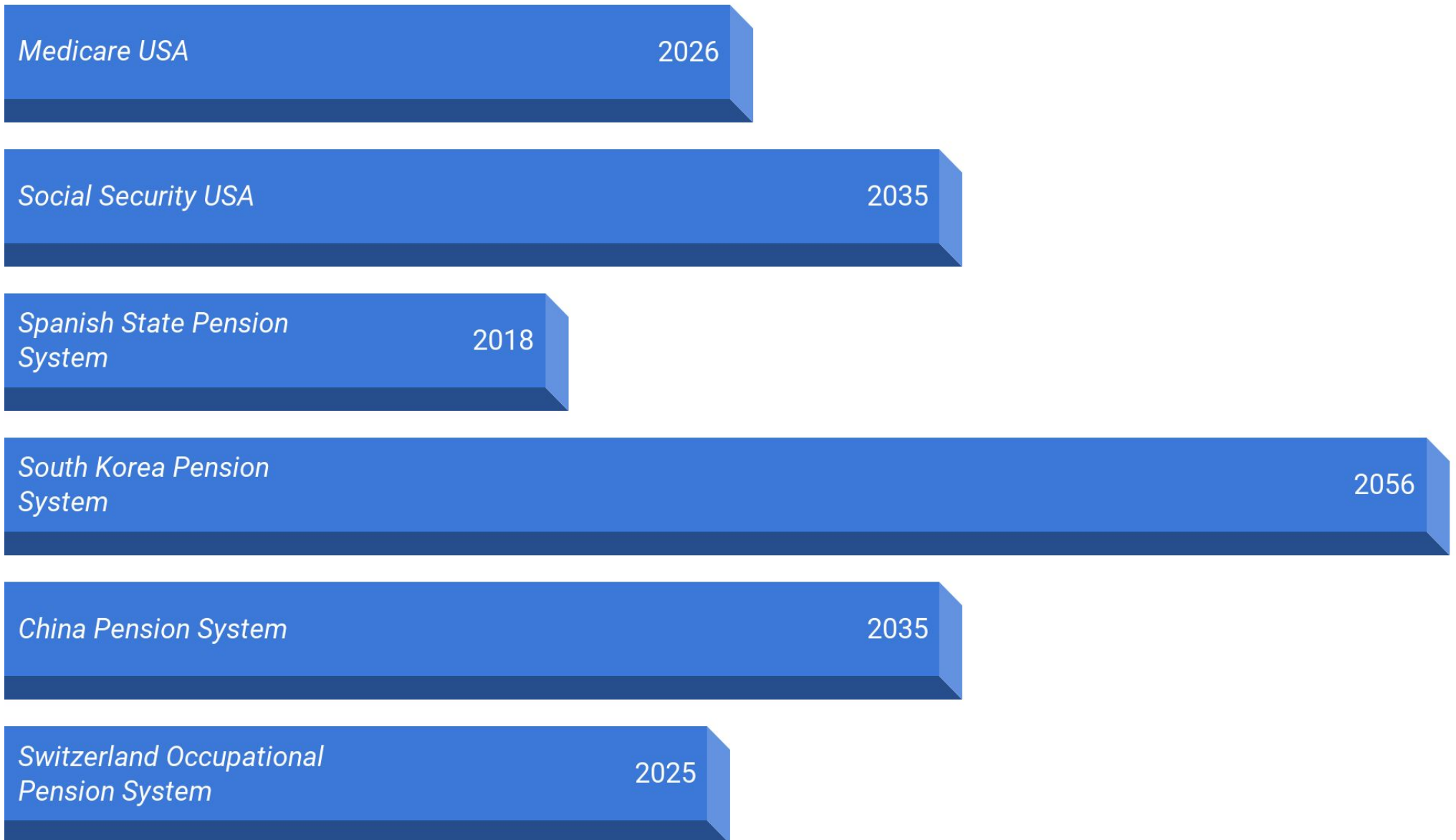
Government-funded scheme	Country	Projected insolvency	Source
Medicare	USA	2026	<a href="https://www.bloomberg.com">bloomberg.com</a>
Social Security	USA	2035	<a href="https://www.bloomberg.com">bloomberg.com</a>
Spanish State Pension System	Spain	2018	<a href="https://www.mishtalk.com">mishtalk.com</a>
South Korea Pension System	Korea	2056	<a href="https://thediplomat.com">thediplomat.com</a>
China pension system	China	2035	<a href="https://www.reuters.com">reuters.com</a>
Switzerland occupational pension system	Switz.	2025	<a href="https://www.ft.com">ft.com</a>

Melbourne Mercer Global Pension Index 2018				
System	Overall Value Index	Sustainability	Adequacy	Integrity
Singapore	70.4	69.5	64.4	81.2
UK	62.5	53.4	57.8	82.9
Japan	48.2	32.4	54.1	60.7
South Korea	47.3	48.1	45.4	49.3
China	46.2	38	53.4	46
Spain	54.4	27.8	68.7	68.6
Switzerland	67.6	67.5	58	83.2
Netherlands	80.3	79.2	75.9	88.8
USA	58.8	57.4	59.1	60.2



# Insolvency Predictions for Government-Funded Schemes

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Sources:

Bloomberg

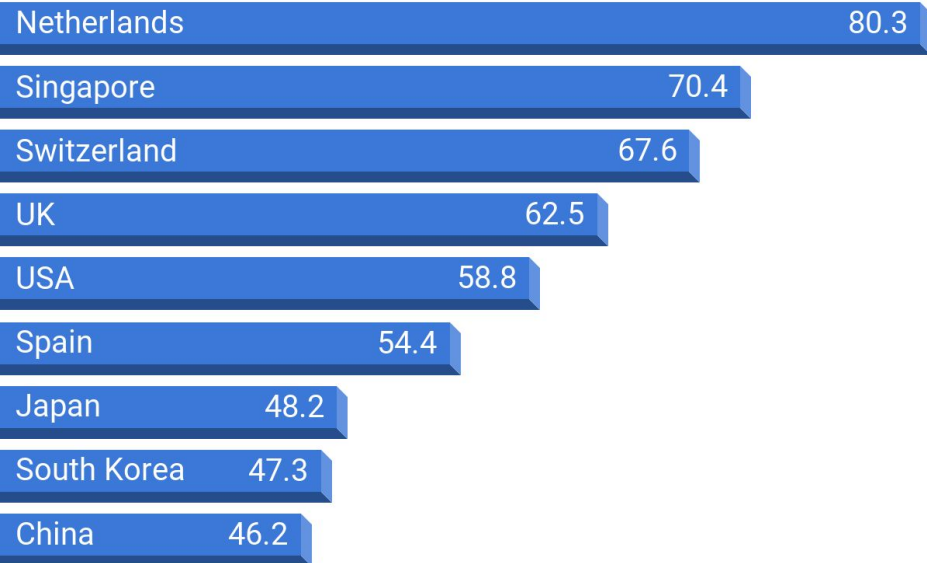
MishTalk

TheDiplomat

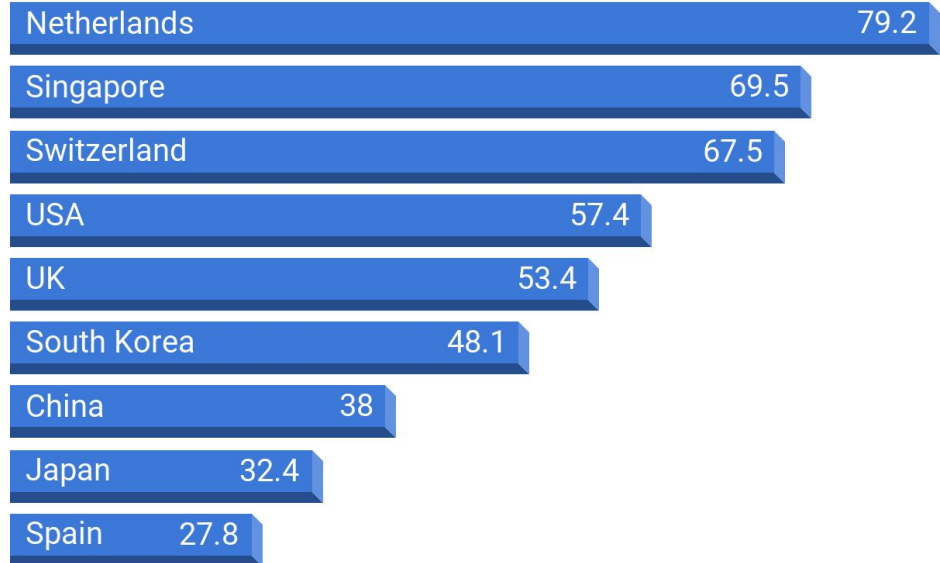
Reuters

Financial Times

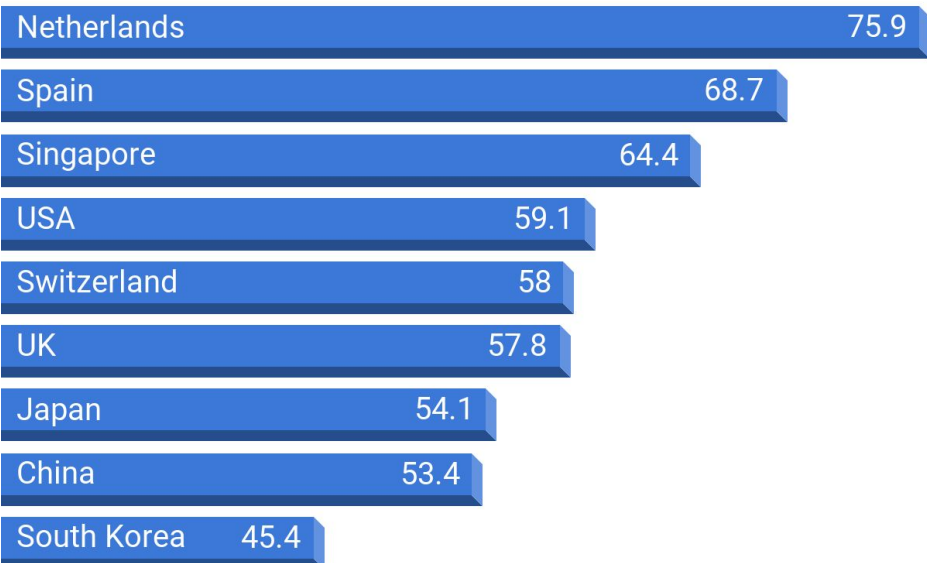
## Overall Value Index



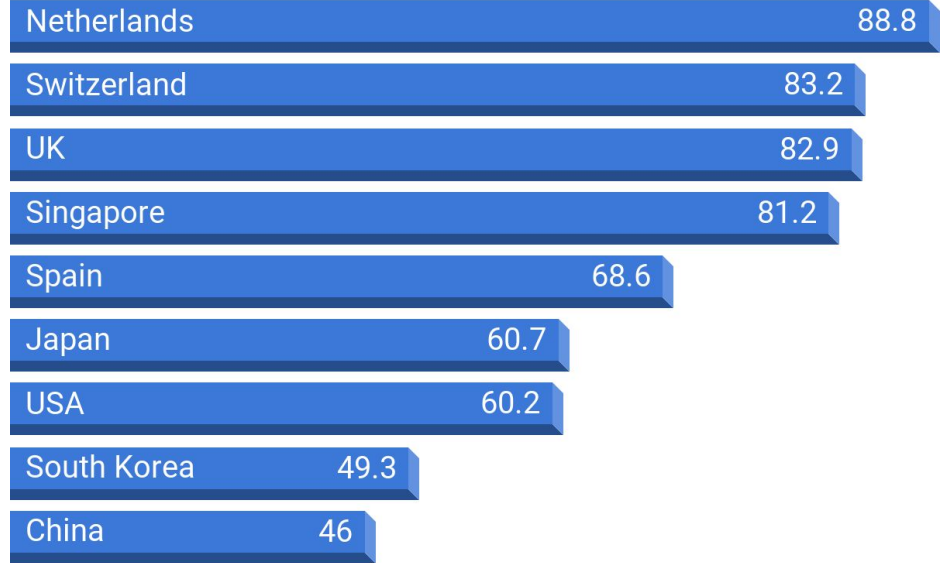
## Sustainability



## Adequacy



## Integrity













# Health-Adjusted Life Expectancy vs. Life Expectancy

33

Health-Adjusted Life Expectancy,  
2016

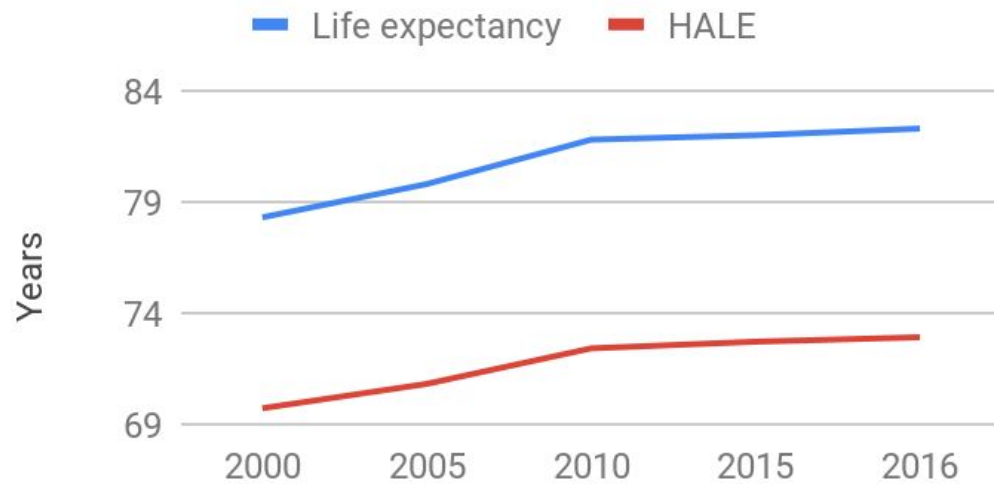
Life Expectancy, 2016

76.2		Singapore	82.9
74.8		Japan	84.2
73.8		Spain	83.1
73.5		Switzerland	83.3
73.0		South Korea	82.7
72.9		Israel	82.3
72.1		Netherlands	81.6
71.9		United Kingdom	81.4
70.6		European Union	81.0
68.7		China	76.4
68.5		USA	78.5

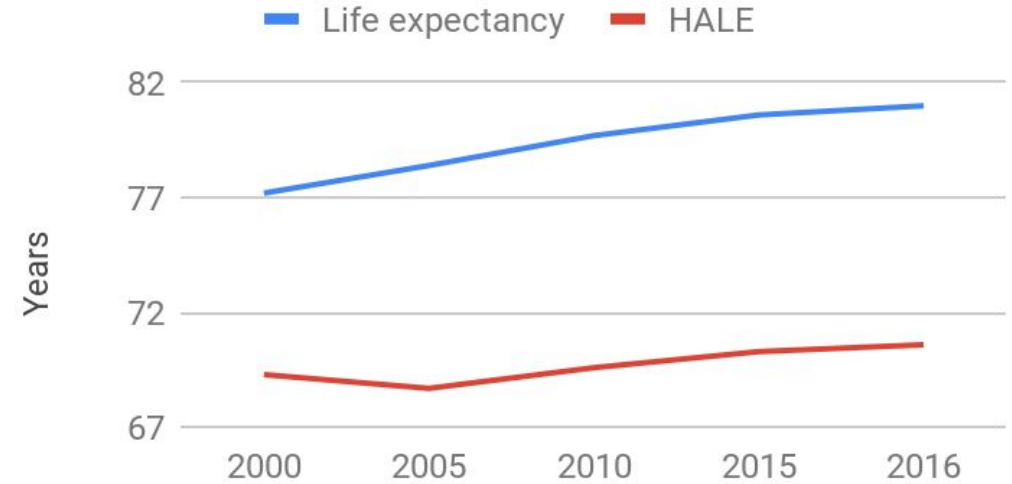


# Health-Adjusted Life Expectancy vs. Life Expectancy Israel, EU, USA and China (2000-2016)

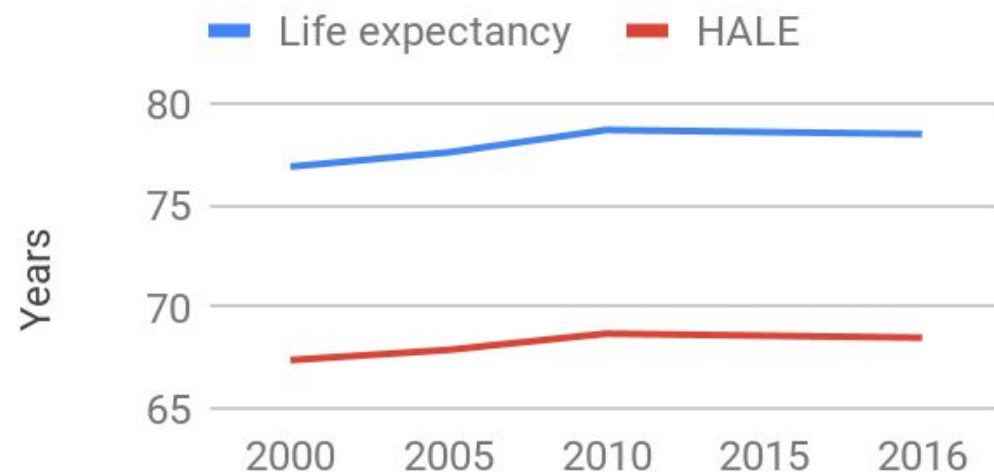
## Israel



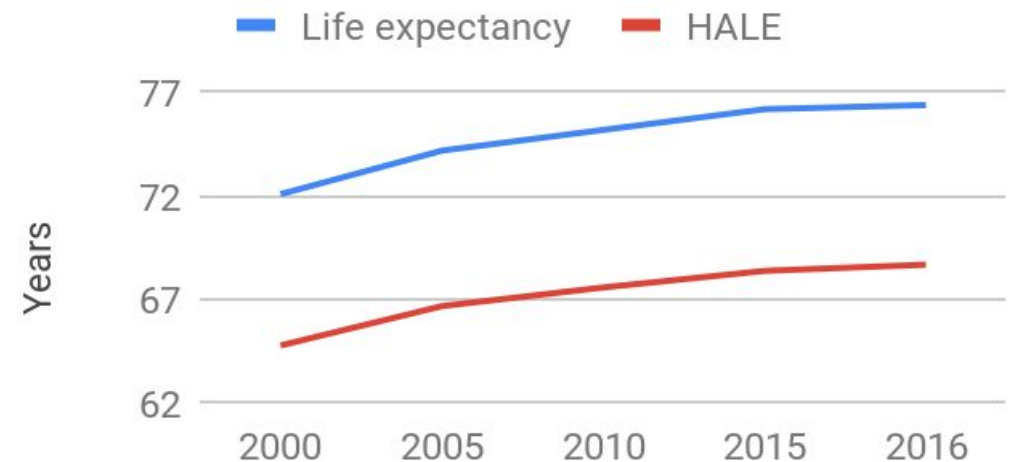
## EU



## USA



## China

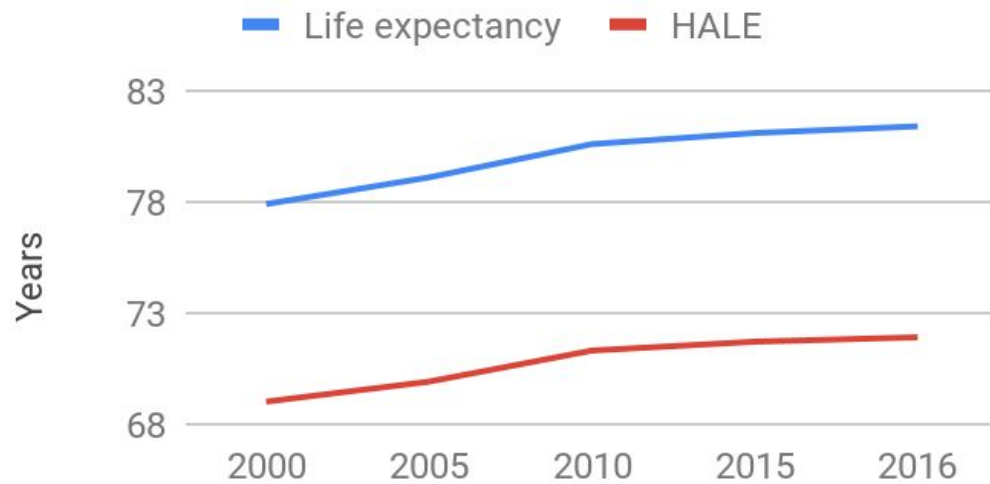




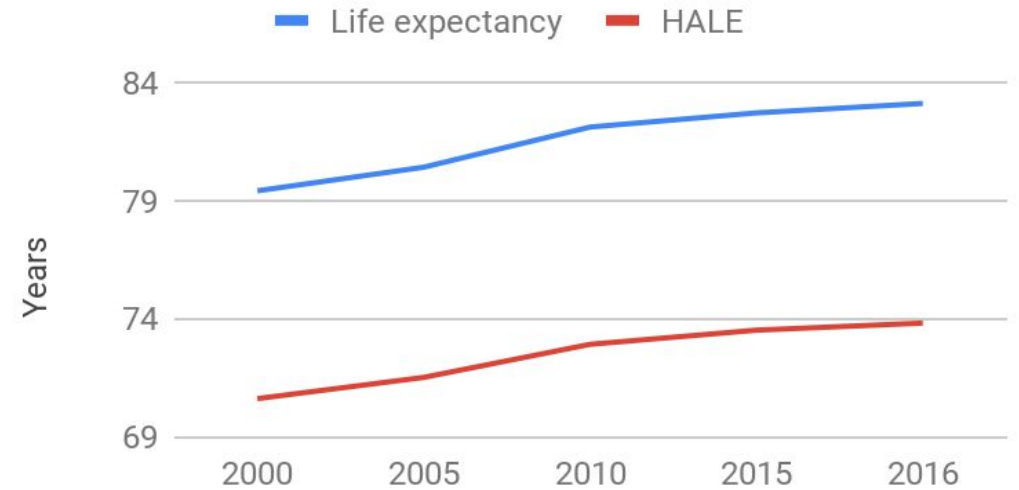


# Health-Adjusted Life Expectancy vs. Life Expectancy UK, Spain, Switzerland and Netherlands (2000-2016)

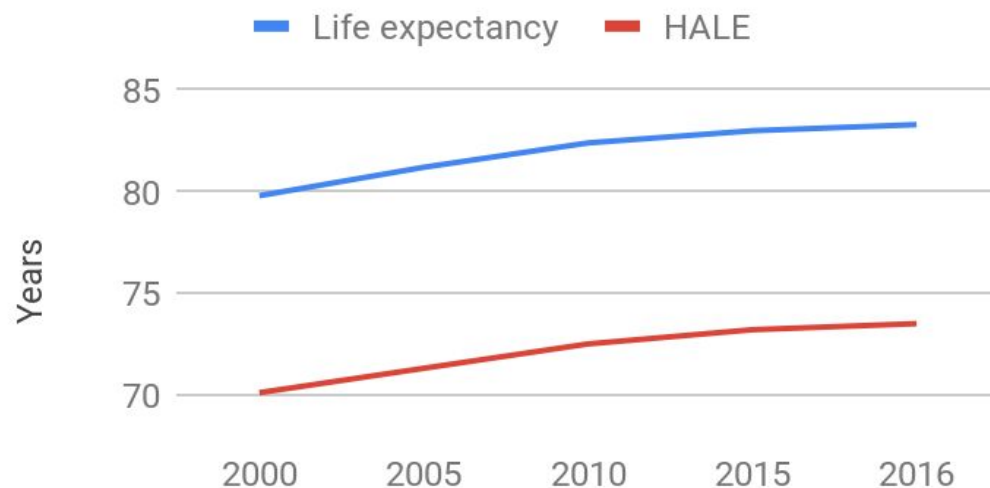
## UK



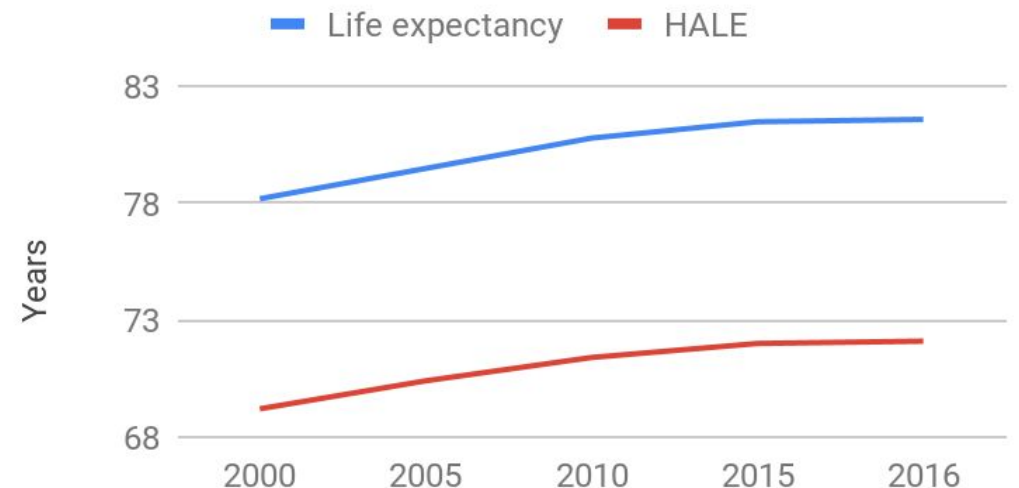
## Spain



## Switzerland

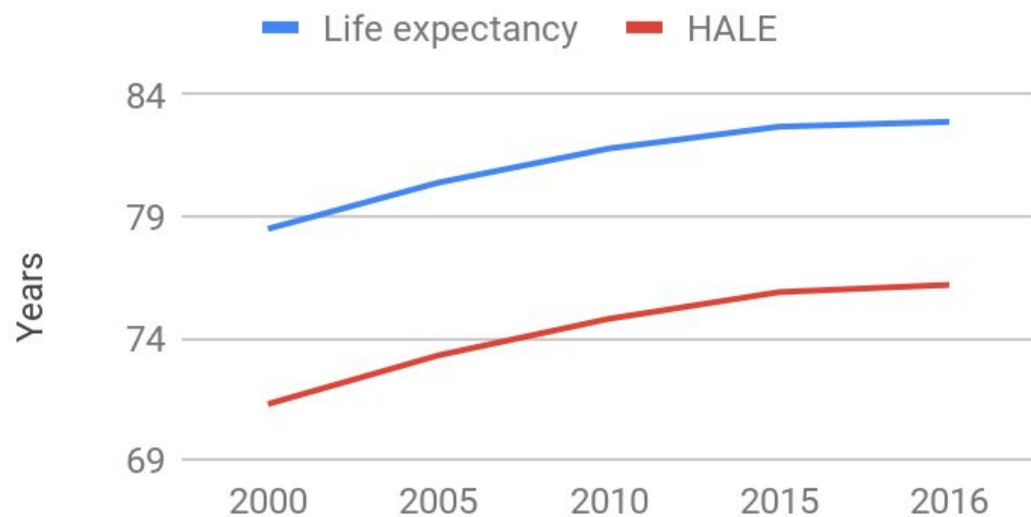


## Netherlands

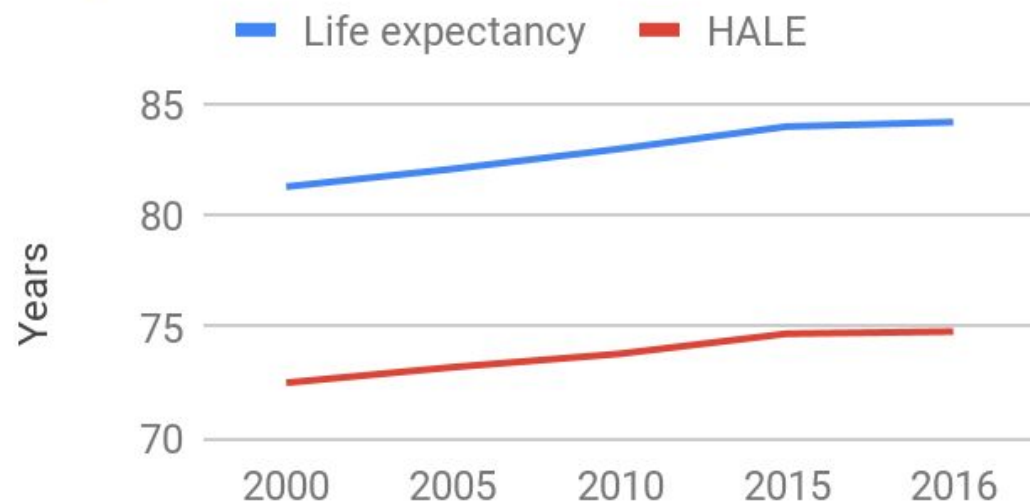


# Health-Adjusted Life Expectancy vs. Life Expectancy Singapore, Japan, and South Korea (2000-2016)

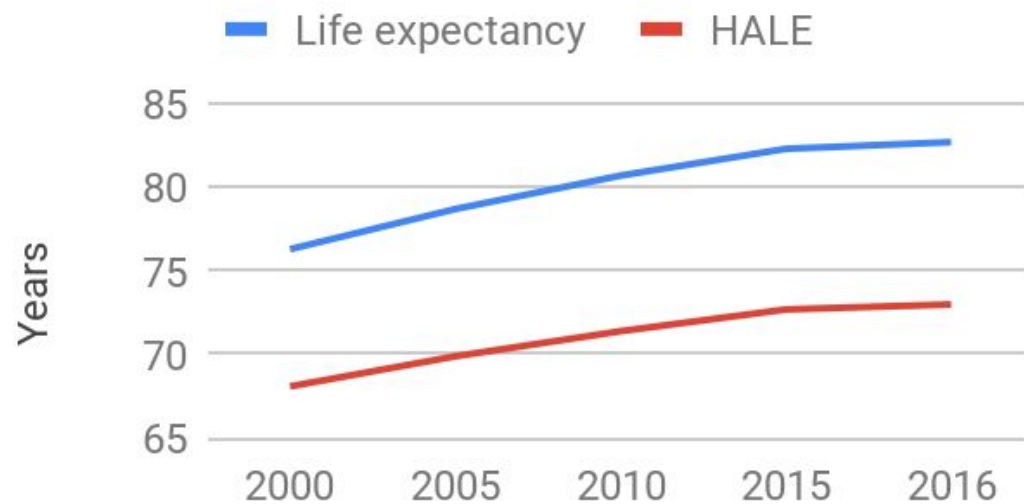
## Singapore



## Japan



## South Korea



# Health-Adjusted Life Expectancy Countries Analysis

37

	HALE/life expectancy ratios 2016	HALE/life expectancy ratios 2000	HALE 2016, years	HALE 2000, years	CAGR HALE	CAGR HALE/Life expectancy ratio
Singapore	91.92%	89.02%	76.20	71.30	0.44%	0.08%
China	89.92%	90.83%	68.70	64.80	0.39%	0.00%
Japan	88.84%	89.18%	74.80	72.50	0.21%	-0.03%
Spain	88.81%	88.92%	73.80	70.60	0.30%	-0.01%
Israel	88.58%	89.02%	72.90	69.70	0.30%	-0.03%
Netherlands	88.36%	88.49%	72.10	69.20	0.27%	-0.01%
UK	88.33%	88.58%	71.90	69.00	0.27%	-0.02%
South Korea	88.27%	89.25%	73.00	68.10	0.46%	-0.07%
Switzerland	88.24%	87.84%	73.50	70.10	0.32%	0.03%
USA	87.26%	87.65%	68.50	67.40	0.11%	-0.03%
EU	87.16%	89.77%	70.60	69.30	0.12%	-0.20%

# Health-Adjusted Life Expectancy Countries Analysis

Asian countries are on top of all the rankings. Singapore is the leader in a number of key metrics, i.e. Singapore has the smallest gap between HALE and life expectancy both in 2000 and 2016, and the country has the biggest annual growth in this metric. Japan has lost the leading position in HALE ranking to Singapore, but it's South Korea that has gained the most position in HALE rankings and has the biggest HALE growth rate.

	Ranking HALE/life expectancy ratios 2016	Ranking HALE/life expectancy ratios 2000	HALE ranking 2016	HALE ranking 2000	CAGR HALE ranking	CAGR HALE/Life expectancy ratio ranking
Singapore	1	1	1	2	2	1
China	2	2	10	11	3	3
Japan	3	5	2	1	9	7
Spain	4	7	3	3	6	4
Israel	5	6	6	5	5	9
Netherlands	6	9	7	7	8	5
UK	7	8	8	8	7	6
South Korea	8	4	5	9	1	10
Switzerland	9	10	4	4	4	2
USA	10	11	11	11	11	8
EU	11	3	9	6	10	11

# Males and Females Life Expectancy in 2018

39

Males

Females

81.1



Japan

87.1

81.2



Switzerland

85.2

80.3



Spain

85.7

80.4



Hong Kong

85.5

80.8



Singapore

85

79.5



South Korea

85.6

80.3



Israel

84.2

80



Netherlands

83.2

79.7



United Kingdom

83.2

77



USA

81.9

75



European Union

82

75



China

77.9

Source:

World Life Expectancy

# Age Dependency Annual Dynamic

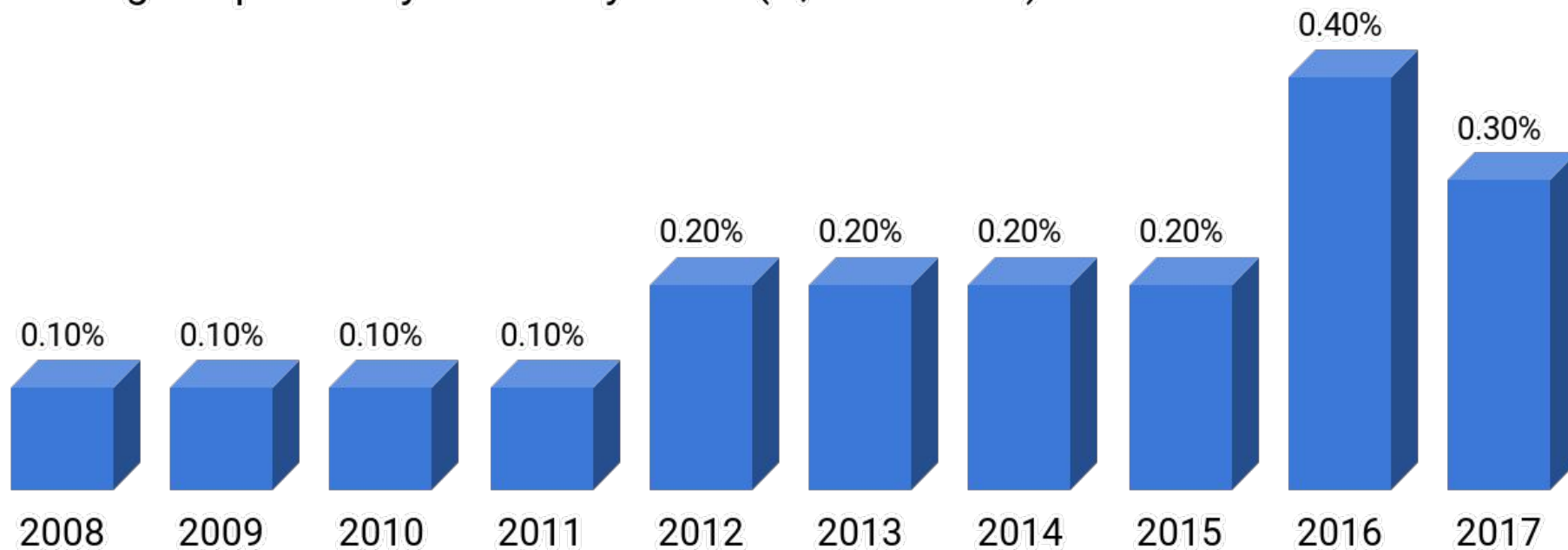
40

The set of figures below shows an annual dynamic of age dependency throughout Israel, Singapore, the UK, Japan, South Korea, Hong Kong, China, Spain, Switzerland, the Netherlands, and the EU. This dynamic shows the growth of age dependency ratio in the current year, compared to the previous one. This allows to see the general tendency, which, we will see further, is positive in all countries.

Right below, we see a general chart, that shows annual age dependency dynamic in the whole world, which allows us to compare the world trend with specific aforementioned countries' tendencies and to see, how these countries perform against the world background.

On the figure below we may see, that the trend is positive. There is a stable annual growth in age dependency throughout all researched period (2007-2017), with indicators of 0.10%-0.40%. The biggest indicator is 0,40%, which is seen in 2016. However, right in the next year, the growth slowed down a little - for 0.10% becomes 0.30%.

World Age Dependency Annual Dynamic (% , 2008-2017)



Source:

[World Bank Data](#)

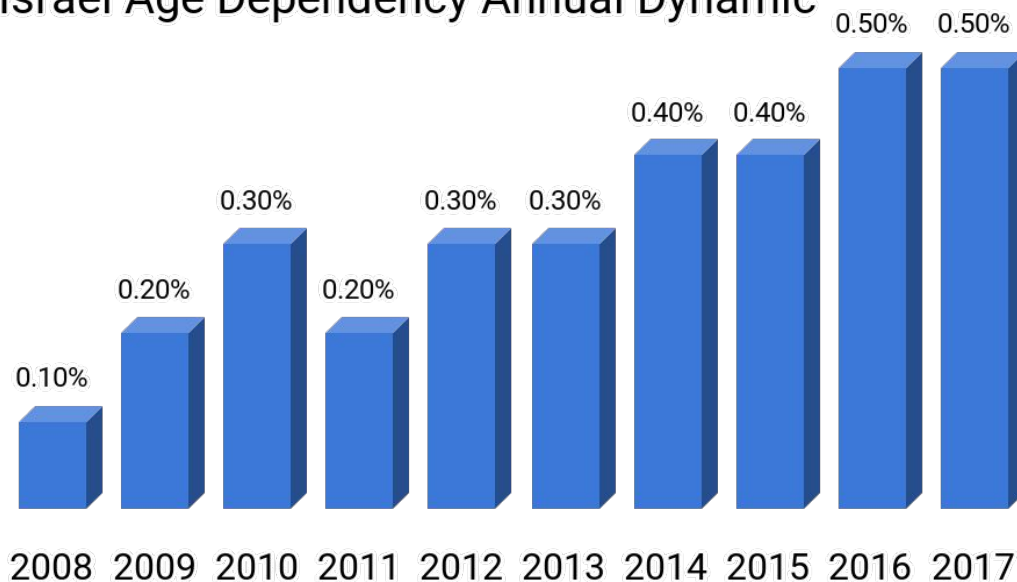




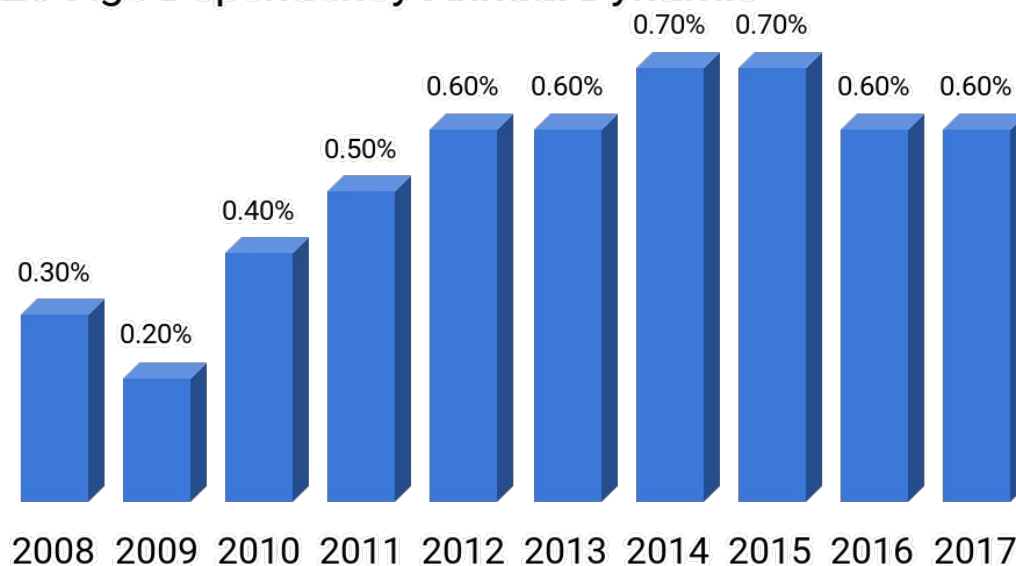
# Israel, EU, USA and China

## Age Dependency Annual Dynamic (% , 2008-2017)

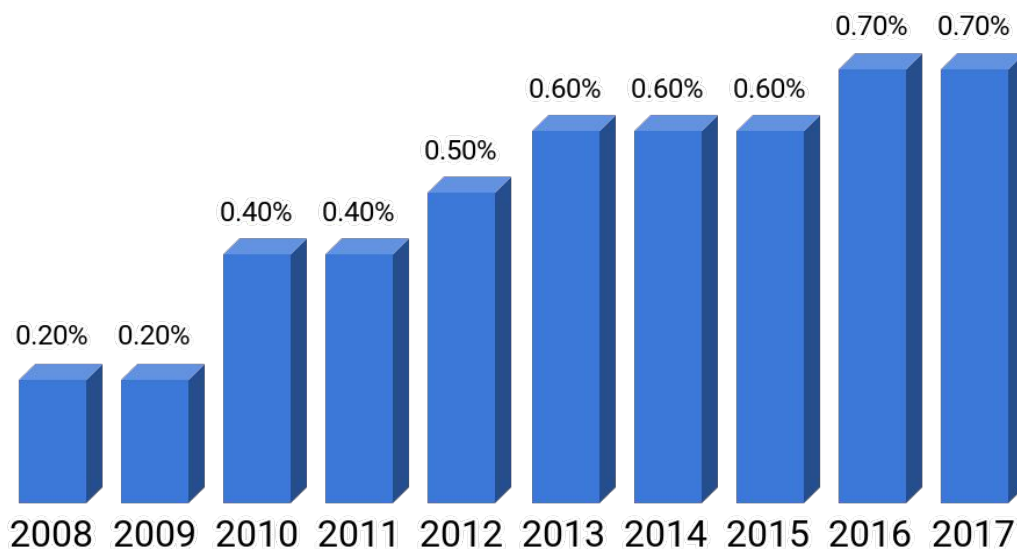
### Israel Age Dependency Annual Dynamic



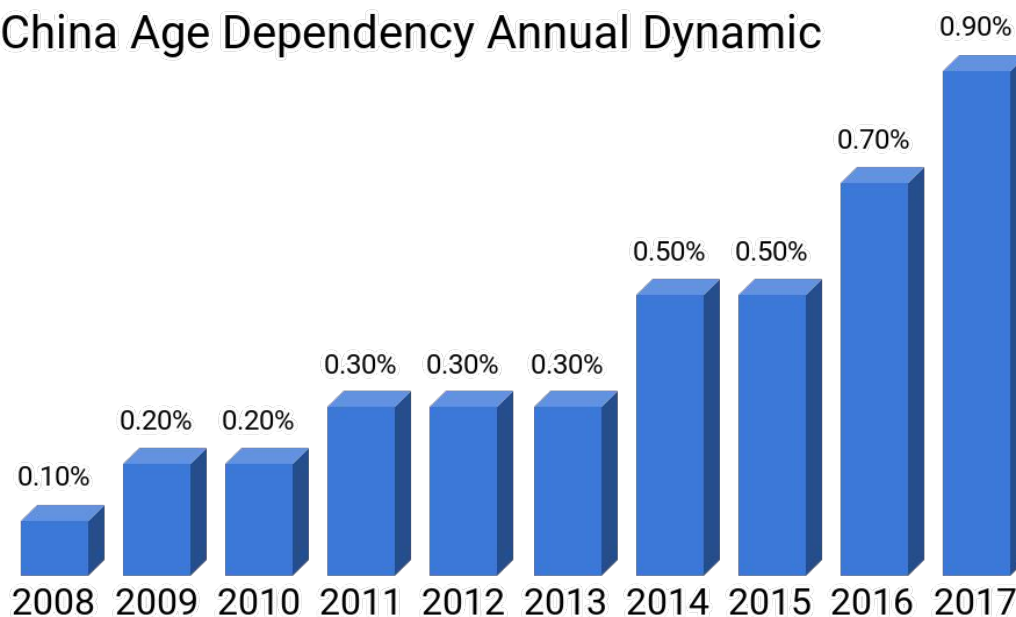
### EU Age Dependency Annual Dynamic



### USA Age Dependency Annual Dynamic



### China Age Dependency Annual Dynamic

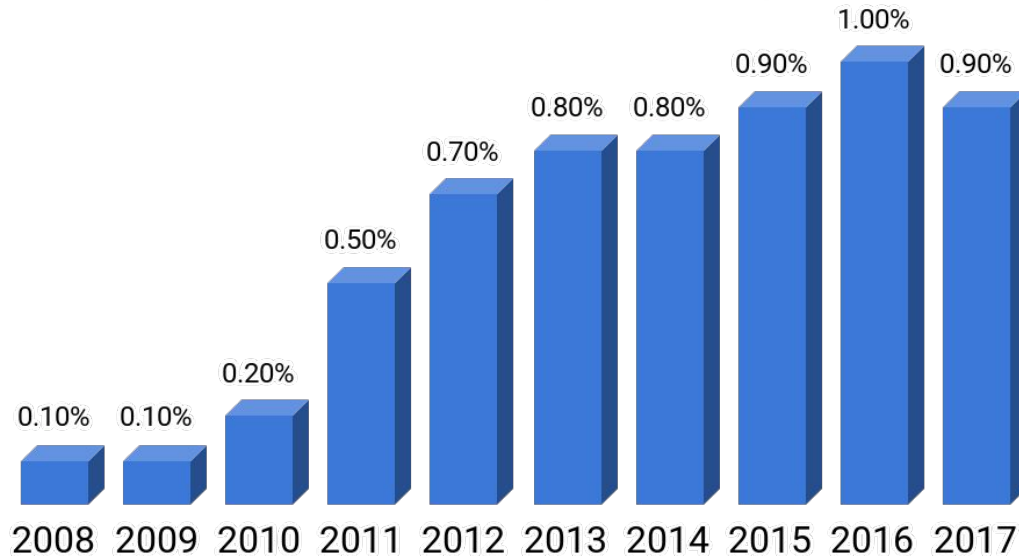




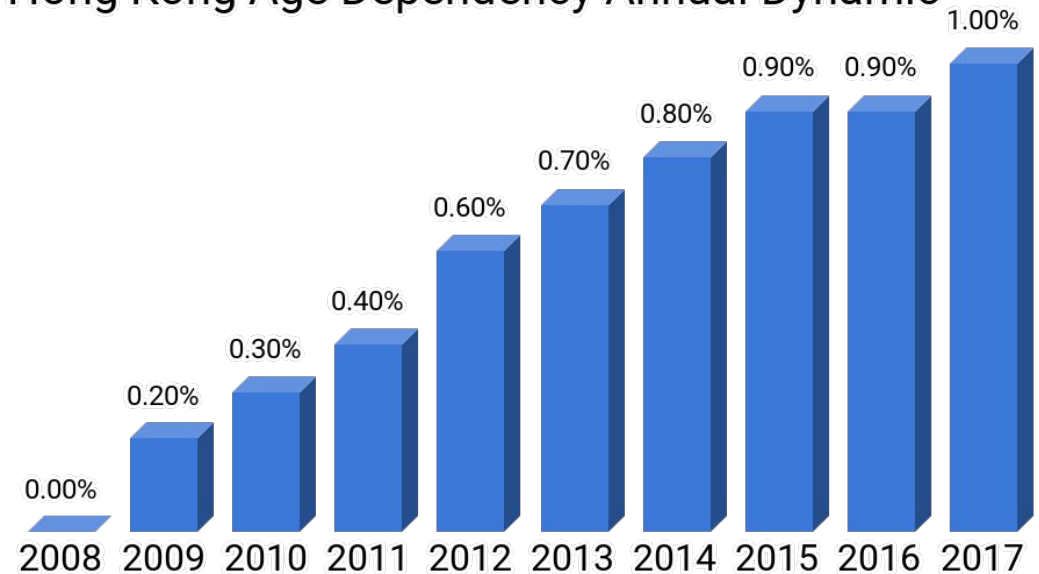
# Singapore, Hong Kong, Japan, and South Korea Age Dependency Annual Dynamic (% , 2008-2017)

42

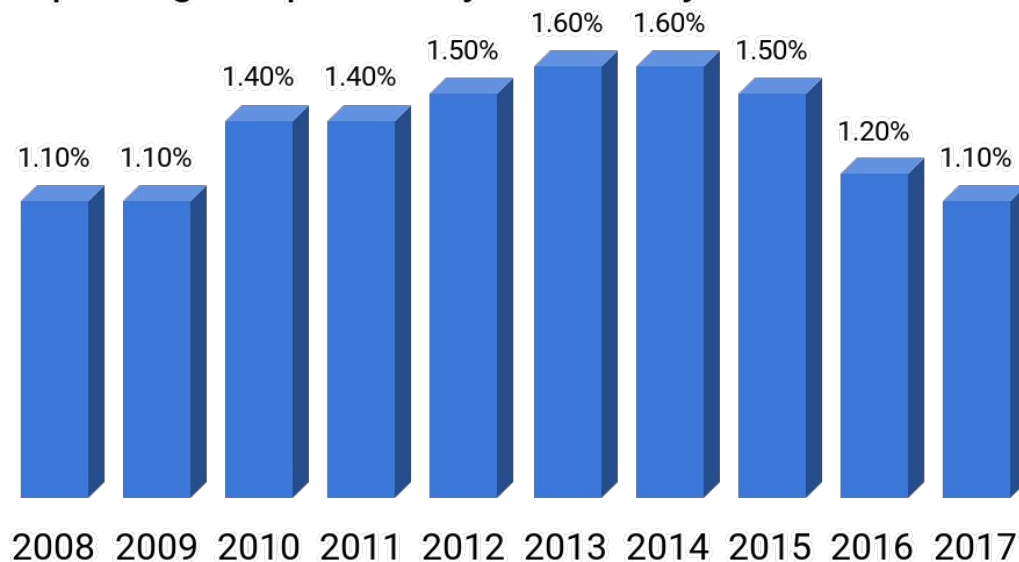
## Singapore Age Dependency Annual Dynamic



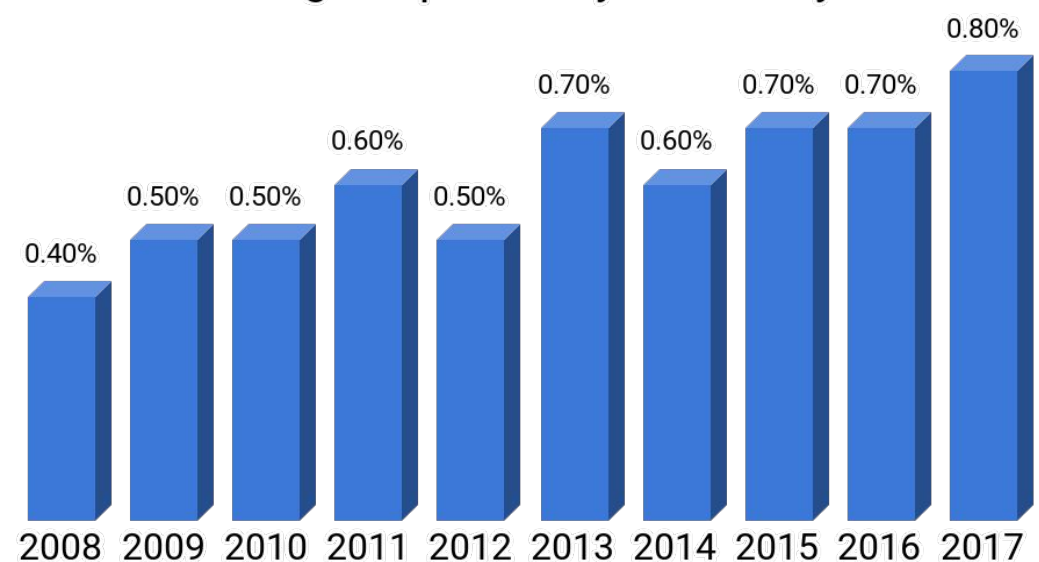
## Hong Kong Age Dependency Annual Dynamic



## Japan Age Dependency Annual Dynamic



## South Korea Age Dependency Annual Dynamic



Source:

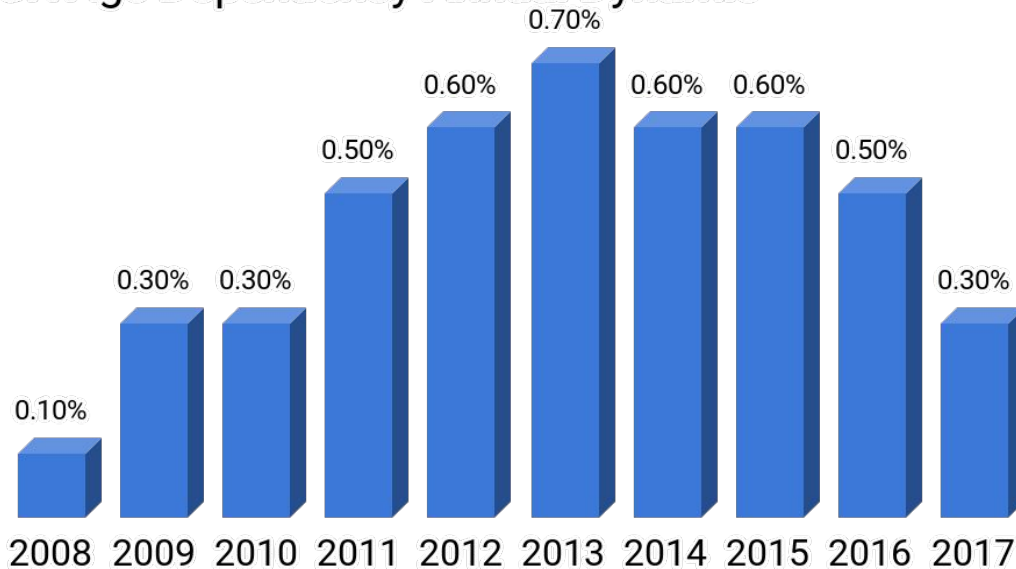
World Bank Data



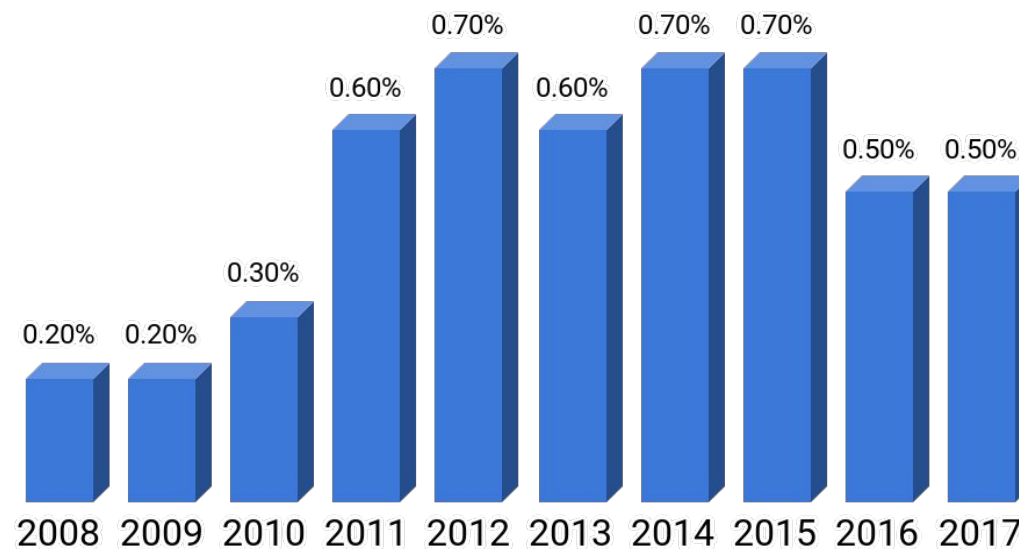
# UK, Spain, Switzerland and Netherlands

## Age Dependency Annual Dynamic (% , 2008-2017)

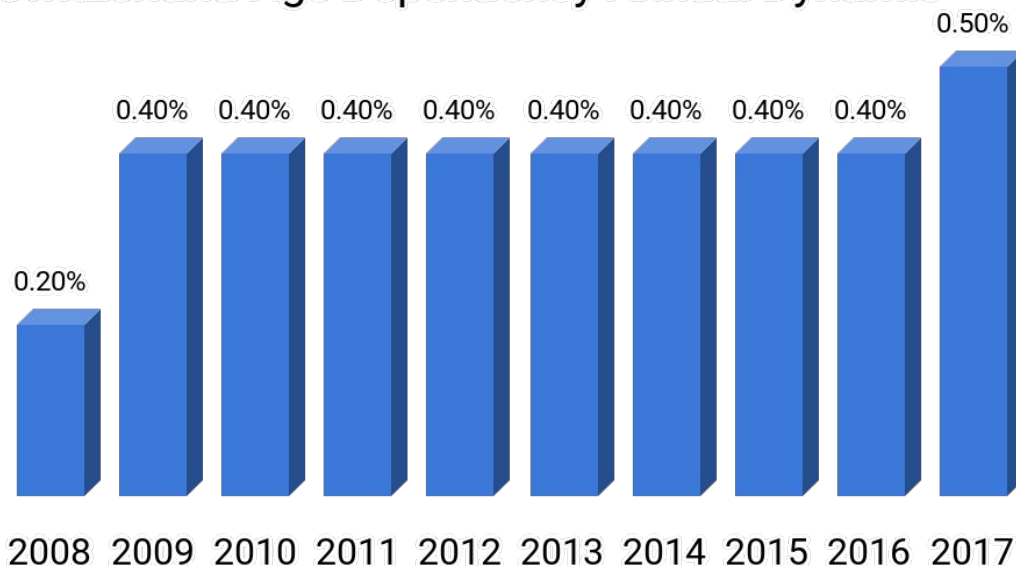
### UK Age Dependency Annual Dynamic



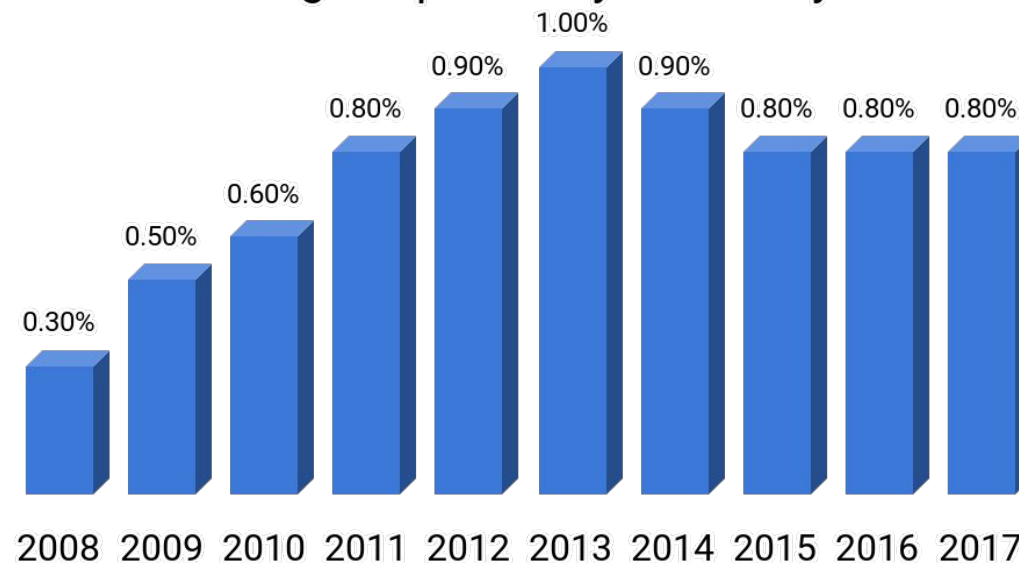
### Spain Age Dependency Annual Dynamic



### Switzerland Age Dependency Annual Dynamic



### Netherlands Age Dependency Annual Dynamic





# Age Dependency Ratio and Early Retirement Age

44

Age Dependency Ratio, 2017

Early Retirement Age, 2017

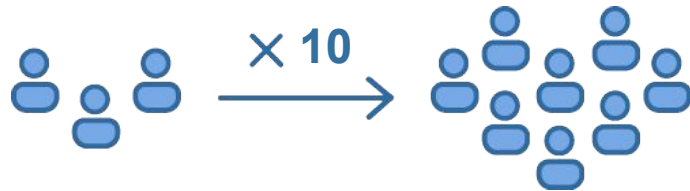
45		Japan	60
30		Spain	60
29		United Kingdom	65
29		Netherlands	52
28		Switzerland	62
23		Hong Kong	60
23		USA	62
19		South Korea	50
19		Israel	65.8
18		Singapore	62
15		China	57.5

Source:

[Age dependency ratio - Data](#)

# Aging Analytics Agency Produced Longevity Reports 10x Faster in 2018

In 2018, Deep Knowledge Ventures injected additional financing to support Aging Analytics Agency's ongoing and future projects. This enabled Aging Analytics Agency to extend the size of its analytics team by 10-fold.



This growth in brain power allowed us to proportionally increase the rate of production of their reports. Just in the past year, Aging Analytics Agency have doubled the number of high-quality reports compared to previous years, which include:

- Global Longevity Industry Overview, totaling over 1200 pages, which offers in-depth profiles of the top 100 companies, investors, non-profits and research labs active in the sphere;
- 850-page specialized case study on the Longevity Industry Landscape in the United Kingdom.

In line with this expansion, they are on track for publishing a greater number of diverse and in-depth reports in the coming year, with some reports expanding further in their prior scope whereas others will be targeting particular topics and niches within the Longevity Industry.



Longevity Industry in  
Singapore 2018



Longevity Industry in the  
UK Q4 2018



Longevity Industry in  
Israel 2018



Longevity Industry in  
California  
2019

# Multiple Special Regional Case Studies Planned for 2019

Following the success of their *Longevity Industry in UK 2018 Landscape Overview* report, they are planning to publish a number of additional regional case studies aimed at countries where the topic of Longevity is experiencing a particularly rapid development.

Such region-specific focus is present due to a number of factors, including the emergence of new Longevity sectors in specific countries, the rise of particularly powerful geroscience tech hubs and R&D nexuses as well as the launch of strategic national development plans proposed by progressive governments.



Longevity Industry in UK Q4 2018



Longevity Industry in Israel 2019



Longevity Industry in Singapore 2019



Longevity Industry in  
Switzerland



Longevity Industry in  
Japan



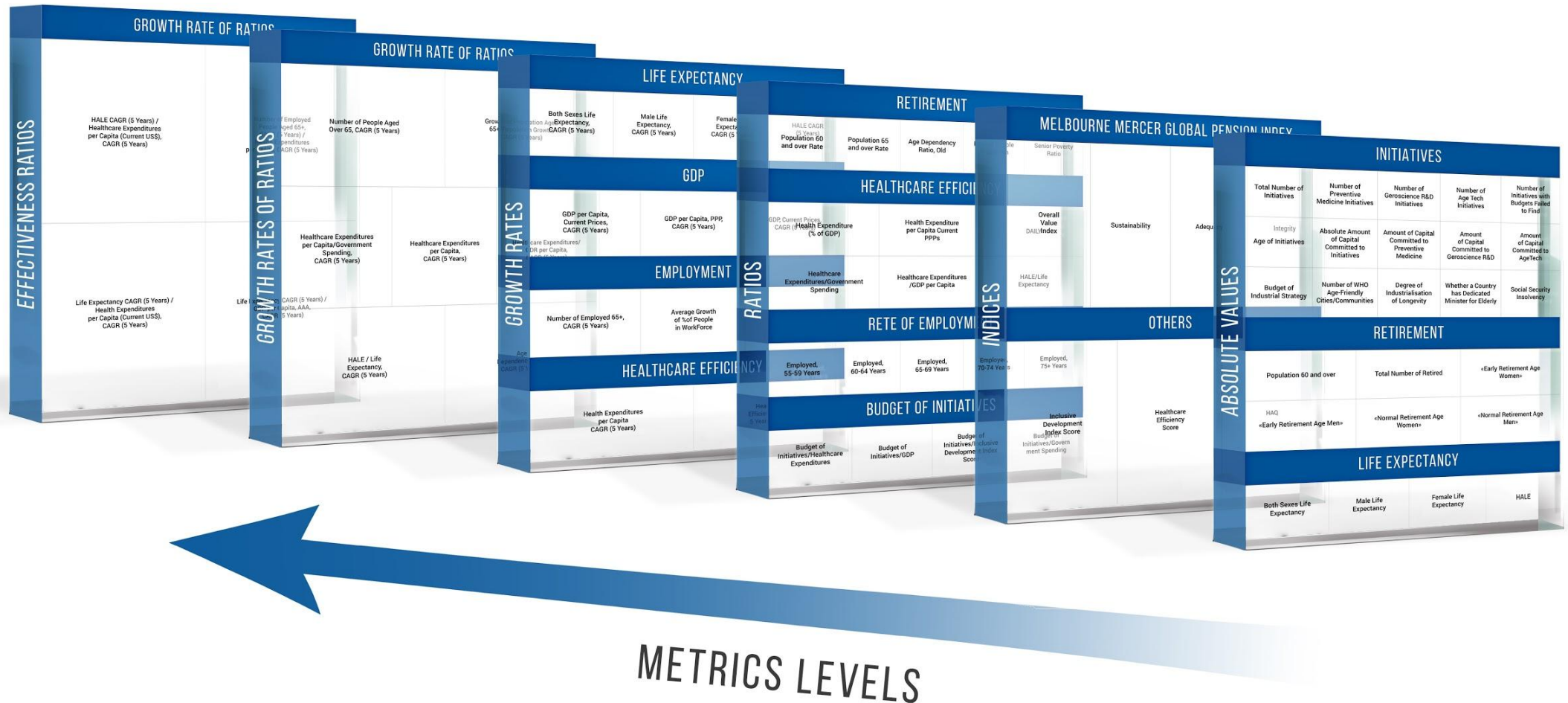
Longevity Industry in  
Hong Kong



Longevity Industry in  
Taiwan



# Government Longevity Related Projects and Initiatives Analytical Framework



# Reports Published in Q1 2019 by Aging Analytics Agency

47



Longevity Industry in UK Q4 2018



FemTech Longevity Landscape Overview



Longevity Industry in Israel 2019



Longevity Industry in Singapore 2019





## Longevity Industry in Israel

### Longevity industry, profiling:

- 160 Longevity companies;
- 180 Longevity investors;
- 10 Longevity non-profit organizations;
- 60 Longevity influencers in Israel;
- 10 Longevity university labs and research labs;
- 10 Longevity conferences.



## Longevity in Singapore

### Longevity industry, profiling:

- 100 Longevity companies;
- 80 Longevity investors;
- 10 Longevity Non-Governmental organizations;
- 30 Longevity influencers in Singapore;
- 15 Longevity R&D centers;
- 15 Longevity conferences.



## Longevity in UK

### Longevity industry, profiling:

- 260 Longevity companies;
- 250 Longevity investors;
- 50 Longevity articles published by UK geroscientists;
- 50 Longevity books published by UK geroscientists;
- 25 Longevity scientific journals published by UK geroscientists;
- 50 Longevity non-profit organizations;
- 55 Longevity influencers in the UK;
- 25 Longevity university labs and research labs.



# Longevity Industry in UK Landscape Q4 2018

## Personalized Medicine

Investors

## Companies

## Non-Profits

**Companies - 260**  
**Investors - 250**  
**Non-Profits - 10**  
**Research Labs - 10**

## AgeTech

**Research  
Labs**

Preventive  
Medicine

## Regenerative Medicine



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# Longevity Industry in Israel Landscape 2019

## Personalized Medicine

Companies - 160  
Investors - 180  
Non-Profits - 10  
R&D Centers - 10

Investors

Companies

Non-Profits

Progressive Wellness

R&D Centers

Preventive Medicine

Regenerative Medicine

AgeTech

**AGING ANALYTICS AGENCY**

**ISRAELI LONGEVITY ALLIANCE**  
ותק - התנועה לאיכות ואריכות חיים (יל"ח)  
Yetek (Seniority) - the Movement for Longevity and Quality of Life

**DEEP KNOWLEDGE ANALYTICS**



**LONGEVITY INTERNATIONAL**



# Longevity Industry in Singapore Landscape 2019

Companies - 100  
Investors - 80  
Non-governmental organisations - 10  
Research Centres - 15

Companies  
Investors  
Non-Profits

Personalized  
Medicine

AgeTech

Progressive  
clinics

Research  
Labs

Preventive  
Medicine

Progressive  
wellness

Regenerative  
Medicine



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LONGEVITY  
INTERNATIONAL





Longevity Industry in Switzerland



Longevity Industry in Japan



Longevity Industry in Hong Kong



Longevity Industry in California



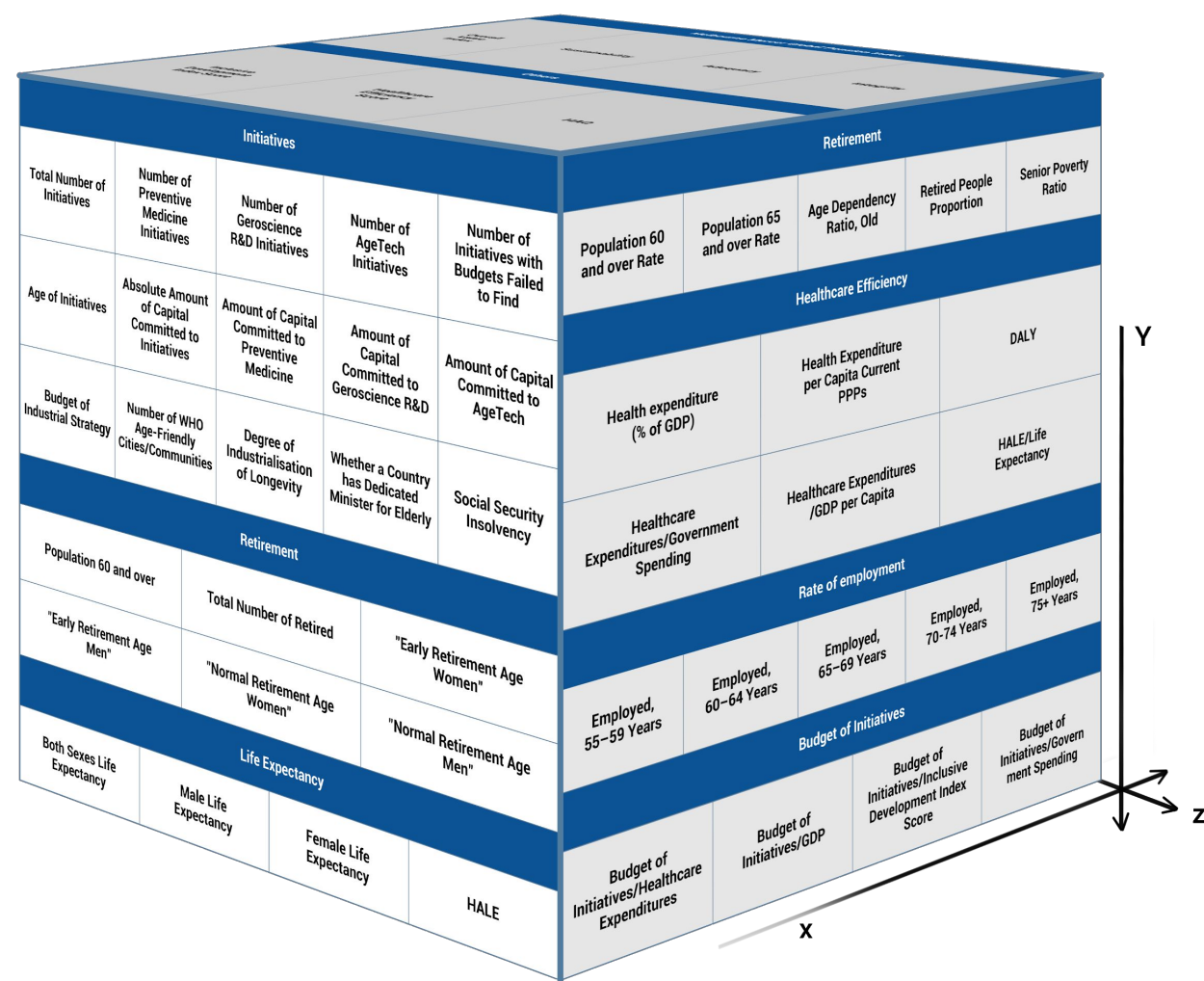
The background of the slide is a dark blue gradient. In the center is a large, semi-transparent image of the Earth, showing the continents of Africa and Europe. Overlaid on the Earth is a network of thin white lines connecting various points, suggesting a global network or data flow. The title 'Report Methodology' is centered in a large, white, sans-serif font. The entire content is framed by a white rectangular border, which is further enclosed by a thick, yellow, L-shaped decorative border at the corners.

# Report Methodology



# Government Longevity Related Projects and Initiatives

## Analytical 3-Dimensional Framework



Overall, there are 6 levels of proprietary metrics which differ based on the nature of the parameters they consist of.

Indicators, their growth rates and their ratios are calculated separately and then integrated in the final metrics system.

The whole of the metrics can also be subdivided into 2 categories based on the logic of the parameters, namely:

- Indicators of potential (or lack thereof);
- Indicators of actual success (or lack thereof).

Thus, the ranking system reflects both strengths and opportunities of different countries regarding the development of national longevity strategies. It can be applied for the evaluation of the current state of a country, as well as of its prospects.

Some metrics indicators are directly interconnected since the ratios are derived from single values which are parameters themselves.





# Government Longevity Related Projects and Initiatives

## Analytical 3-Dimensional Framework



Absolute values are enhanced by relative ones, and the use of both in combination enables a clearer understanding of interconnections between the parameters and provides the opportunity to investigate the relative roles of different factors in the overall country ranking process.

Each level of metrics is based upon the extension, further subdivision or comparative combination of the previous of the metrics in the preceding level, or is derived from insights provided by them.

The research is based on open source data and information given by WHO, OECD, The World Bank, and different institutions of each specific country.

All budget data is compared in US\$ translated by the change rate of the starting year of the initiative without inflation taken into account.



# Methodology for Ranking Countries Efforts on the Front of Government Longevity-Related Projects and Initiatives

***To assess countries according to the number and relevance of their government-led longevity projects and initiatives, a sum of metrics parameters taking into account 75 metrics were used.***

## **Metrics Values**

Each metric's absolute value is recalculated into the *relative score* within the range [0.0-1.0]. To be more specific, if a metric is numeric, the formula for score calculation is the absolute value of a country divided by the maximal absolute value among the countries. If a metric is qualitative (yes/no), a value "yes" equals to 1.0 and a value "no" equals to 0.0. The qualitative metric "Degree of government industrialization of longevity" has 3 values according to the industrialization of Longevity in a country: *Industrial Strategies* (equals to 1.0); *National or metropolitan master plans* (equals to 0.5); *Independent or municipal government programs* (equals to 0.0).

## **Weight Factors**

To equalize each metric in terms of significance among others the *weight factors* are applied. Each *weight factor* is in the range from -1.0 to 1.0, where 1.0 - the most favorable metric, -1.0 - the most detrimental metric and 0,0 - not an important metric at all (if the factor is negative, the higher positive magnitude of *relative score*, the worse for a country's score). The *weighted score* of a country for a particular metric is *relative score* multiplied by an *weight factors*.

## **Final Score**

Consequently, the countries were ranked according to the sum of their *weighted scores* of each metric. The higher the final score the more advanced a country in terms of government Longevity-related projects and initiatives.



# Metrics Structure. 1st Level

<b>Initiatives</b>	Total Number of Initiatives	Amount of Capital Committed to Preventive Medicine
	Number of Preventive Medicine Initiatives	Amount of Capital Committed to Geroscience R&D
	Number of Geroscience R&D Initiatives	Amount of Capital Committed to AgeTech
	Number of AgeTech Initiatives	Budget of Industrial Strategy Number of WHO Age-Friendly Cities/Communities
	Number of Initiatives with Undisclosed Budgets	Degree of Industrialisation of Longevity
	Age of Initiatives	Whether a Country has Dedicated Minister for Elderly Social Security Insolvency
	Absolute Amount of Capital Committed to Initiatives	
<b>Retirement</b>	Population 60 and over	Early Retirement Age Men
	Total Number of Retired	Normal Retirement Age Women
	Early Retirement Age Women	Normal Retirement Age Men
<b>Life Expectancy</b>	Both Sexes Life Expectancy	Female Life Expectancy
	Male Life Expectancy	HALE



<b>Melbourne Mercer Global Pension Index</b>	Overall Value Index
	Sustainability
	Adequacy
	Integrity
<b>Retirement</b>	Inclusive Development Index Score
	Healthcare Efficiency Score
	HAQ



<b>Retirement</b>	Population 60 and over Rate	Retired People Proportion
	Population 65 and over Rate	Senior Poverty Ratio
	Age Dependency Ratio, Old	
<b>Healthcare Efficiency</b>	Health expenditure (% of GDP)	Healthcare Expenditure /GDP per Capita
	Health Expenditure per Capita Current PPPs DALY	HALE/Life Expectancy
	Healthcare Expenditure/Government Spending	
<b>Rate of Employment</b>	Employed, 55–59 Years	Employed, 70-74 Years
	Employed, 60–64 Years	Employed, 75+ Years
	Employed, 65–69 Years	
<b>Budget of Initiatives</b>	Budget of Initiatives/Healthcare Expenditure	Budget of Initiatives/Inclusive Development Index Score
	Budget of Initiatives/GDP	Budget of Initiatives/Government Spending



## Metrics Structure. 4th Level

60

Life Expectancy	Both Sexes Life Expectancy, CAGR (5 Years)	Female Life Expectancy, CAGR (5 Years)
	Male Life Expectancy, CAGR (5 Years)	HALE CAGR (5 Years)
GDP	GDP per Capita, Current Prices, CAGR (5 Years)	GDP, Current Prices, CAGR (5 Years)
	GDP per Capita, PPP, CAGR (5 Years)	
Employment	Number of Employed 65+, CAGR (5 Years)	Rate of Population Aging (65+ Years)
	Average Growth of % of People in Workforce	
Healthcare Efficiency	Health Expenditure per Capita, CAGR (5 Years)	Healthcare Efficiency Score, 5 Years Growth



# Metrics Structure. 5th and 6th Level

Growth Rate of Ratios	Number of People Aged Over 65, CAGR (5 Years)
	Growth of Population Aged 65+ / Population Growth, CAGR (5 Years)
	Healthcare Expenditure per Capita / Government Spending, CAGR (5 Years)
	Healthcare Expenditure per Capita, CAGR (5 Years)
	Healthcare Expenditure / GDP per Capita, CAGR (5 Years)
	HALE / Life Expectancy, CAGR (5 Years) Age Dependency Ratio, CAGR (5 Years)

Effectiveness Ratios	HALE CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)
	Number of Employed People Aged 65+, CAGR (5 Years) / Health Expenditure per Capita, CAGR (5 Years)
	Life Expectancy CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)
	Life Expectancy CAGR (5 Years)/GDP per Capita, AAA, CAGR (5 Years)



1st Level												
Initiatives												
0.2	0.4	0.4	0.1	-0.1	0.15	0.5	0.3	0.3	0.1	1	0.05	1
Total Number of Initiatives	Number of Preventive Medicine Initiatives	Number of Geroscience R&D Initiatives	Number of AgeTech Initiatives	Number of Initiatives with Budgets Failed to Find	Age of Initiatives	Absolute Amount of Capital Committed to Initiatives	Amount of Capital Committed to Preventive Medicine	Amount of Capital Committed to Geroscience R&D	Amount of Capital Committed to AgeTech	Budget of Industrial Strategy	Number of WHO Age-Friendly Cities/Communities	Degree of Industrialisation of Longevity
Initiatives			Retirement				Life Expectancy					
1	-0.35	0.025	-0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.1	
Whether a Country has Dedicated Minister for Elderly	Social Security Insolvency	Population 60 and over	Total Number of Retired	Early Retirement Age Women	Early Retirement Age Men	Normal Retirement Age Women	Normal Retirement Age Men	Both Sexes Life Expectancy	Male Life Expectancy	Female Life Expectancy	HALE	
2nd Level												
Melbourne Mercer Global Pension Index					Others							
0.05	0.05	0.05	0.05	1	0.05	0.05						
Overall Value Index	Sustainability	Adequacy	Integrity	Inclusive Development Index Score	Healthcare Efficiency Score	HAQ						

These levels of metrics define the score of the countries and initiatives through comparison of the Absolute values and Indexes.

3rd Level											
Healthcare Efficiency						Retirement					
0.01	0.01	-0.01	0.05	0.05	0.1	0.01	0.01	-0.01	-0.01	-0.01	
Health expenditure (% of GDP)	Health Expenditure per Capita Current PPPs	DALY	Healthcare Expenditure/ Government Spending	Healthcare Expenditure/ GDP per Capita	HALE/Life Expectancy	Population 60 and over Rate	Population 65 and over Rate	Age Dependency Ratio, Old	Retired People Proportion	Senior Poverty Ratio	
Budget of Initiatives				Rate of Employment							
0.1	0.1	0.15	0.1	0.01	0.15	0.15	0.15	0.15			
Budget of Initiatives/ Healthcare Expenditure	Budget of Initiatives/ GDP	Budget of Initiatives/ Inclusive Development Index Score	Budget of Initiatives/ Government Spending	Employed, 55–59 Years	Employed, 60–64 Years	Employed, 65–69 Years	Employed, 70-74 Years	Employed, 75+ Years			
4th Level											
Life Expectancy				GDP			Employment		Healthcare Efficiency		
0.01	0.01	0.01	0.1	0.005	0.005	0.005	0.1	0.3	0.01	0.01	0.01
Both Sexes Life Expectancy, CAGR (5 Years)	Male Life Expectancy, CAGR (5 Years)	Female Life Expectancy, CAGR (5 Years)	HALE CAGR (5 Years)	GDP per Capita, Current Prices, CAGR (5 Years)	GDP per Capita, PPP, CAGR (5 Years)	GDP, Current Prices, CAGR (5 Years)	Number of Employed 65+, CAGR (5 Years)	Average Growth of % of People in Workforce	Rate of Population Aging (65+ Years)	Health Expenditure per Capita, CAGR (5 Years)	Healthcare Efficiency Score, 5 Years Growth

The third and fourth levels define the score of the countries through comparison of open data ratios and growth rates, mostly provided by WHO, OECD, The World Bank and Governmental institutions of each country.



5th Level						
Growth Rate of Ratios						
0.01	0.05	0.05	0.05	0.05	0.05	-0.01
Number of People Aged Over 65, CAGR (5 Years)	Growth of Population Aged 65+ / Population Growth, CAGR (5 Years)	Healthcare Expenditure per Capita / Government Spending, CAGR (5 Years)	Healthcare Expenditure per Capita, CAGR (5 Years)	Healthcare Expenditure / GDP per Capita, CAGR (5 Years)	HALE / Life Expectancy, CAGR (5 Years)	Age Dependency Ratio, CAGR (5 Years)
6th Level						
Effectiveness ratios						
0.2	0.2	0.2	0.2			
HALE CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)	Number of Employed People Aged 65+, CAGR (5 Years) / Health Expenditure per Capita, CAGR (5 Years)	Life Expectancy CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)	Life Expectancy CAGR (5 Years)/GDP per Capita, AAA, CAGR (5 Years)			

The fifth and sixth levels define the score of the countries through the comparison of calculated growth rates of ratios and ratios of effectiveness. These two levels are based on the previous levels and mostly represent the changes of metrics of a specific country on a 5 year period of time compared to other countries.

Total Number of Initiatives
Number of Preventive Medicine Initiatives
Number of AgeTech Initiatives
Number of Initiatives with Closed Budgets
Degree of Industrialisation of Longevity
Age of Initiatives
Social Security Insolvency
Budget of Industrial Strategy
Amount of Capital Committed to AgeTech
Amount of Capital Committed to Geroscience R&D
Absolute Amount of Capital Committed to Initiatives
Amount of Capital Committed to Preventive Medicine
Whether a Country has Dedicated Minister for Elderly
Number of WHO Age-Friendly Cities/Communities
Initiatives
1st Level

The metrics used in this report’s proprietary analysis are divided into 6 levels, according to their complexity and importance:

1<sup>st</sup> level – **absolute values** – primary values of analysed parameters, both economic and health-related;

2<sup>nd</sup> level – **indexes** – includes Inclusive Development Index (IDI), Healthcare Indexes and Melbourne Mercer Global Pension Index.

3<sup>rd</sup> level – **ratios** – includes ratios in 4 main categories: Retirement, Healthcare efficiency, Life Expectancy and Budget of initiatives;

4<sup>th</sup> level – **growth rate of the values**– calculated compound annual growth rates of five to six years for the used indexes;

5<sup>th</sup> level - **growth rate of ratios** - compound annual growth rates of Ageing Population, Healthy Life Expectancy and Healthcare Expenditures;

6<sup>th</sup> level - **effectiveness ratios** - ratios that use growth rates of parameters to analyse cost-effectiveness of expenditures on healthcare.

Government Longevity  
National Development Plans:  
Analytic Framework Metrics

You can review this framework in a bigger scale by this link - [Aging Analytics Agency Approach and Methodology.](#)



Budget of Industrial Strategy	cost-effectiveness of expenditures on healthcare.												Age Dependency Ratio, CAGR (5 Years)					
Amount of Capital Committed to AgeTech	Normal Retirement Age Men					HALE/Life Expectancy									HALE / Life Expectancy, CAGR (5 Years)			
Amount of Capital Committed to Geroscience R&D	Normal Retirement Age Women					Senior Poverty Ratio	DALY	Employed, 75+ Years									Healthcare Expenditure / GDP per Capita, CAGR (5 Years)	
Absolute Amount of Capital Committed to Initiatives	Early Retirement Age Men	HALE	Integrity			Retired People Proportion	Healthcare Expenditure /GDP per Capita	Employed, 70-74 Years	Budget of Initiatives/ Government Spending				HALE CAGR (5 Years)	Healthcare Expenditure per Capita, CAGR (5 Years)	Life Expectancy CAGR (5 Years)/GDP per Capita, AAA, CAGR (5 Years)			
Amount of Capital Committed to Preventive Medicine	Early Retirement Age Women	Female Life Expectancy	Adequacy	HAQ	Age Dependency Ratio, Old	Healthcare Expenditure/Go vernment Spending	Employed, 65–69 Years	Budget of Initiatives/GDP			GDP, Current Prices, CAGR (5 Years)	Rate of Population Aging (65+ Years)	Female Life Expectancy, CAGR (5 Years)	Healthcare Expenditure per Capita / Government Spending, CAGR (5 Years)	Life Expectancy CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)			
Whether a Country has Dedicated Minister for Elderly	Total Number of Retired	Male Life Expectancy	Sustainability	Inclusive Development Index Score	Population 65 and over Rate	Health Expenditure per Capita Current PPPs	Employed, 60–64 Years	Budget of Initiatives/ Inclusive Development Index Score	Healthcare Efficiency Score, 5 Years Growth	GDP per Capita, PPP, CAGR (5 Years)	Average Growth of % of People in Workforce	Male Life Expectancy, CAGR (5 Years)	Growth of Population Aged 65+ / Population Growth, CAGR (5 Years)	Employed People Aged 65+, CAGR (5 Years) / Health Expenditure per Capita, CAGR (5 Years)				
Number of WHO Age-Friendly Cities/ Communities	Population 60 and Over	Both Sexes Life Expectancy	Overall Value Index	Healthcare Efficiency Score	Population 60 and over Rate	Health expenditure (% of GDP)	Employed, 55–59 Years	Budget of Initiatives/ Healthcare Expenditure	Health Expenditure per Capita, CAGR (5 Years)	GDP per Capita, Current Prices, CAGR (5 Years)	Number of Employed 65+, CAGR (5 Years)	Both Sexes Life Expectancy, CAGR (5 Years)	Number of People Aged Over 65, CAGR (5 Years)	HALE CAGR (5 Years) / Health Expenditure per Capita (Current US\$), CAGR (5 Years)				
Initiatives	Retirement	Life Expectancy	Melbourne Mercer Global Pension Index	Others	Retirement	Healthcare Efficiency	Rate of employment	Budget of Initiatives	Healthcare Efficiency	GDP	Employment	Life Expectancy	Growth Rate of Ratios	Effectiveness ratios				
1st Level			2nd Level		3rd Level				4th Level				5th Level	6th Level				



# Methodology for Health-Adjusted Life Expectancy Countries Analysis

HALE (Health-Adjusted life expectancy) refers specifically to the healthy number of years someone is expected to live at birth, which equals their life expectancy minus the number of years expected to be lived in a state of illness or disability as opposed to life expectancy at birth that is defined as how long, on average, a newborn can expect to live, if current death rates do not change. **Therefore, HALE is a more useful and revealing metric compared with average life expectancy.** The following metrics were used in this report to identify leaders in longevity government planning:

Metric definition	Calculation
GAGR (the Compound Annual Growth Rate) HALE	$\text{GAGR HALE} = (\text{HALE 2016 value} / \text{HALE 2000 value})^{(1/(16-1))} - 1$ , where 16 is number of years between the start and finish values
HALE/Life expectancy ratio shows the gap between HALE and life expectancy	$\text{HALE/Life expectancy ratio} = \text{HALE value} / \text{Life expectancy value}$
GAGR HALE/Life expectancy ratio illustrates whether HALE and life expectancy are converging (approaching each other), or diverging (e.g. life expectancy rising without an increase in HALE)	$\text{GAGR HALE/Life expectancy ratio} = (\text{HALE Life expectancy 2016 value} / \text{HALE Life expectancy 2000 value})^{(1/(16-1))} - 1$

For the country to be considered as a leader in HALE, it should have the maximum possible values in all three aforementioned metrics, i.e. CAGR HALE must be at least greater than zero, HALE/Life expectancy ratio should be as close to 100% as possible, and CAGR HALE/Life expectancy ratio must be greater than zero. The source for all the data for the analysis is WHO Life tables. Hong Kong is not included in the analysis because there is no HALE data for the country.



Initiatives in ageing, longevity and health are considered crucial metrics in assessing leadership in longevity development planning. In this report, these are the targeted initiatives are that focus on meeting the challenges of worldwide aging with groundbreaking market solutions and progressive public policies. The greatest attention is paid to public actions and governmental programmes that are aimed at P3 medicine and geroscience.

For the report there were used the following metrics that helped us identify the leaders in longevity:

Metric definition	Formula
Total Number of Initiatives	Based on own research
Number of Preventive Medicine Initiatives	Based on own research
Number of Geroscience R&D Initiatives	Based on own research
Number of AgeTech Initiatives	Based on own research
Number of Initiatives with Closed Budgets	Based on own research
Age of Initiatives	Based on own research
Absolute Amount of Capital Committed to Initiatives	Based on own research



For the report there were used the following metrics that helped us identify the leaders in longevity:

Metric definition	Formula
Amount of Capital Committed to Preventive Medicine	Based on own research
Amount of Capital Committed to Geroscience R&D	Based on own research
Amount of Capital Committed to AgeTech	Based on own research
Budget of Industrial Strategy	Based on own research
Number of WHO Age-Friendly Cities/Communities	Based on own research
Degree of Industrialisation of Longevity	Based on own research
Whether a Country has Dedicated Minister for Elderly	Based on own research
Social Security Insolvency	Based on own research

For the country to be considered as a leader in retirement, it should have the maximum possible values in total number of initiatives. The only one minimum value must be for the metric “Number of Initiatives with Closed Budgets” as it indicates less effectiveness of government.

The source for all the data for the analysis is Governments reports, National Bureaus of Statistics.





Retirement is defined when a person chooses to leave the workforce. Many people choose to retire when they are eligible for private or public pension benefits, although some are forced to retire when bodily conditions no longer allow the person to work any longer (by illness or accident) or as a result of legislation concerning their position. For the report there were used the following metrics that helped us identify the leaders in longevity:

Metric definition	Formula
Population 60 and over - an indicator that defines the elderly population in a country.	An absolute value that is derived from sourcing the data
Total Number of Retired - an indicator that defines the total number of retired people in a particular country.	An absolute value that is derived from sourcing the data
Early Retirement Age Women - an indicator of female early pension withdrawal before age 60 that is possible in occupational and private pension plans.	An absolute value that is derived from sourcing the data
Early Retirement Age Men - an indicator of male early pension withdrawal before age 60 that is possible in occupational and private pension plans.	An absolute value that is derived from sourcing the data
Normal Retirement Age Women - an indicator of female the lowest normal statutory pension age.	An absolute value that is derived from sourcing the data
Normal Retirement Age Men - - an indicator of male the lowest normal statutory pension age.	An absolute value that is derived from sourcing the data

For the country to be considered as a leader in retirement, it should have the minimum possible values in total number of retired, and the maximum values in other five aforementioned metrics. The source for all the data for the analysis is WHO Life tables, National Bureaus of Statistics.



Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Life expectancy could be considered as one of the most important measures of health. It is readily comparable across countries and indicates how well a government is doing in terms of healthcare improvements. For the report there were used the following metrics that helped us identify the leaders in longevity:

Metric definition	Formula
Both sexes life expectancy - is a statistical measure of the average time a person is expected to live, based on the year of its birth, its current age and other demographic factors.	An absolute value that is derived from sourcing the data
Male life expectancy - is a statistical measure of the average time men are expected to live.	An absolute value that is derived from sourcing the data
Female life expectancy - is a statistical measure of the average time women are expected to live.	An absolute value that is derived from sourcing the data
HALE - an indicator of healthy life expectancy.	An absolute value that is derived from sourcing the data

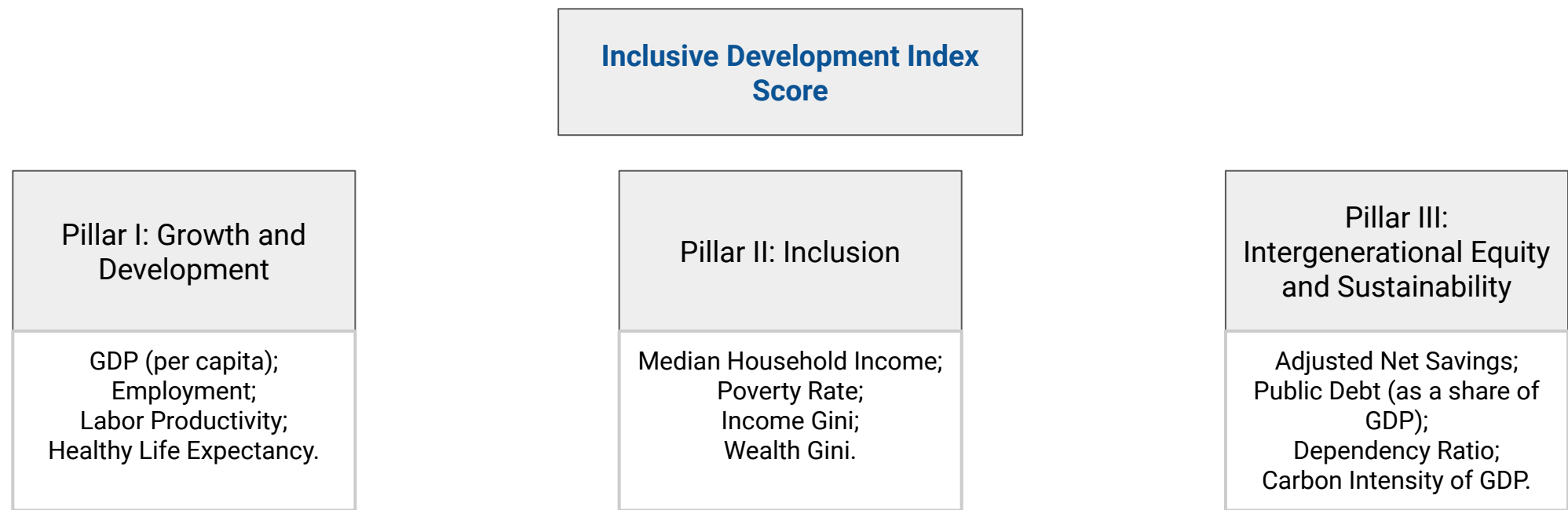
For the country to be considered as a leader in life expectancy, it should have the maximum possible values in all four aforementioned metrics, i.e. both sexes life expectancy, HALE must be equal to the greatest possible number, as it is the most important metric in the category.

The source for all the data for the analysis is WHO Life tables, National National Bureaus of Statistics. Hong Kong is not included in the HALE analysis because there is no HALE data for the country.



**The Inclusive Development Index (IDI)** was introduced in 2017 as part of the *World Economic Forum’s System Initiative*. It is a new, annual economic index that recognize broad-based and sustained progress in living standards as the key measure for national economic performance, rather than GDP growth alone. The Inclusive Development Index captures a more integrated picture of the relative state of economic development than GDP alone. A comparison between a country's IDI and GDP rank reveals to what extent economic growth has been inclusive, **meaning it is distributed fairly across society and creates opportunities for all. IDI is therefore a more relevant metric for government longevity planning than GDP alone.**

The following **index** metric was used in this report to identify leaders in longevity government planning:



For the country to be considered as a leader in Inclusive Growth and Development, the score should be equal to the biggest possible number within the interval [1;7]. The source for all the data for the analysis is World Economic Forum.



Healthcare efficiency measures whether healthcare resources are being used to get the best value for money, where the value of healthcare is as a means to improve health. Efficiency is concerned with the relation between resource inputs (costs, in the form of labour, capital, or equipment) and either intermediate outputs (numbers treated, waiting time, etc) or final health outcomes (lives saved, life years gained, quality adjusted life years (QALYs)).

The following **indexes** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Health-Efficiency Index score - an indicator of the efficiency of the country's healthcare system.	Weighted average of Life Expectancy, Relative Healthcare Cost, Absolute Healthcare Cost
Global Healthcare Access and Quality Index score	Based on 32 causes from which death should not occur in the presence of effective care to approximate personal health-care access

For the country to be considered as a leader in Healthcare Indexes, all two aforementioned metrics should have the biggest possible value, i.e. Health-Efficiency Index score and Global Healthcare Access and Quality Index score should be equal to the greatest possible number on the scale of 0 to 100, as it would indicate that the country's healthcare system is not just of high quality but affordable and cost-effective as well.

The source for all the data for the analysis is Bloomberg, The Lancet.



The Melbourne Mercer Global Pension Index (MMGPI) compares retirement income systems around the world based on their adequacy, sustainability and integrity. The provision of financial security in retirement is critical for both individuals and societies as countries grapple with the social and economic effects of ageing populations. The Index provides a valuable contribution to the global debate about how best to support older members of our societies. It is encouraging to see governments responding to their Index ranking as they develop their national schemes.

The following **indexes** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Overall Value Index	Weighted average of Sustainability, Adequacy, Integrity sub-indexes
Sustainability sub-index - considers a number of indicators which influence the long-term sustainability of current retirement income systems	Based on economic importance of the private pension system, its level of funding, the length of expected retirement both now and in the future etc
Adequacy sub-index - considers the benefits provided to the poor and the average-income earner as well as several design features and characteristics which enhance the efficacy of the overall retirement income system	Based on the net household saving rate, the level of household debt and the homeownership rate are also included as non-pension savings represent an important source of financial security during retirement
Integrity sub-index - defines the requirements that apply to the funded pension plans which normally exist in the private sector	Based on three broad areas of the pension system, namely regulation and governance; protection and communication for members; and costs

For the country to be considered as a leader in Melbourne Mercer Global Pension Index, all four aforementioned metrics should have the biggest possible score in the range of 0-100l. The source for all the data for the analysis is The Australian Centre for Financial Studies.



Healthcare efficiency measures whether healthcare resources are being used to get the best value for money, where healthcare is a means to the end of improved health. Efficiency is concerned with the relation between resource inputs (costs, in the form of labour, capital, or equipment) and either intermediate outputs (numbers treated, waiting time, etc) or final health outcomes (lives saved, life years gained, quality adjusted life years (QALYs)).

The following ratio metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Health expenditure (% of GDP) - an indicator of level of current health expenditure expressed as a percentage of GDP.	Health expenditure 2017 value/GDP 2017 value
HALE/life expectancy - an indicator of the gap between HALE and Life Expectancy.	HALE 2016 value/Life expectancy 2016 value

For the country to be considered as a leader in Healthcare Efficiency, all two aforementioned metrics should have the greatest possible values, i.e. Health expenditure (% of GDP) should be as close to 100 percent as possible, as it would demonstrate the country’s willingness and commitment to spend on health preservation and improvement of its citizens. HALE/life expectancy ratio should be equal as close to 1 as possible, as it would demonstrate that the gap between HALE and life expectancy is small.

The source for all the data for the analysis is World Bank, OECD, National National Bureaus of Statistics.



Health spending measures the final consumption of health care goods and services (i.e. current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments.

The following ratio metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Healthcare Expenditure per capita - estimates current Expenditure on health per capita expressed in US dollars at purchasing power parity (PPP).	Healthcare Expenditure 2017 value/Population 2017 value
Healthcare Expenditure/Government spending - estimates a share of health spending in general government spending.	Healthcare Expenditure 2017 value/Government spending 2017 value
Healthcare Expenditure/GDP per capita - an indicator of healthcare spending in relation to GDP per capita.	Health Expenditure 2017 value/GDP per capita 2017 value

For the country to be considered as a leader in Healthcare Expenditure, all three aforementioned metrics should have the greatest possible values, i.e. Healthcare Expenditure per capita must be equal to the greatest possible number, Healthcare Expenditure/Government spending should be as as bigger than 0% as possible, Healthcare Expenditure/GDP per capita must be equal to the greatest possible number.

The source for all the data for the analysis is National National Bureaus of Statistics, World Bank.



Retirement is when a person chooses to leave the workforce. The concept of full retirement – being able to permanently leave the workforce later in life – is relatively new, and for the most part only culturally widespread in first-world countries. Dramatic advances in healthcare have extended the lives of people in, predominantly, first-world and developed countries. That means that an increasing number of people are going to become retirees, which will pose a significant burden on the government and the workforce.

The following **ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Retired people proportion, % - an indicator of the share of retirees in the workforce	Number of persons not engaged in work aged 65 over/Value of population aged 15 over
Age dependency ratio, old, % - an indicator of older dependents--people older than 64--to the working-age population--those ages 15-64	Number of people older than 64/Value of working-age population
Population aged 65 and over, % - and indicator of the size of aged demographic segment of the population	Number of people aged 65 and over/Population value
Population aged 60 and over, % - and indicator of the size of aged demographic segment of the population	Number of people aged 60 and over/Population value

For the country to be considered as a leader in Retirement, the first two metrics should be valued as low as possible, i.e. retired people proportion should be as close to zero percent as possible, age dependency ratio, old must be as close to zero percent as possible as well, and the 3rd and 4th metrics should not be valued close to zero but, at the same time, should not be valued close to 100%, as it would cause a significant disruption in the economy and society.

The source for all the data for the analysis is World Bank, National Bureaus of Statistics.

In these metrics the budget of initiatives refers to the sum total of money allocated by a particular government to all of its longevity-relevant initiatives. Although some of the initiatives in this report, such as simple policy changes, require no upfront investment, the majority, which range from urban developments to geroscience investments, have a significant monetary value attached. The ratio of money allocated to government initiatives relative to other revenues and Expenditure reflects a degree of commitment from government. We include separate metrics for budgets for preventive medicine projects, longevity industrial strategy, and geroscience R&D, as these represent differences in priority (long-termism etc) in government strategy. The following **ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Budget of initiatives /Healthcare Expenditure - an indicator of the share of longevity-related initiatives in the public healthcare spending.	Budget of initiatives value/Healthcare Expenditure value
Budget of initiatives/GDP - an indicator of the share of longevity-related initiatives in the country's GDP.	Budget of initiatives value/GDP value
Budget of initiatives/Government spending - an indicator of the share of longevity-related initiatives in the general government spending	Budget of initiatives value/Government spending value
Budget of Initiatives/Inclusive Development Index Score - an indicator of the share of longevity-related initiatives budget in the country's Inclusive Development Index Score.	Budget of Initiatives value/Inclusive Development Index Score

For the country to be considered as a leader in Funding of longevity-related initiatives, all three aforementioned metrics should have the greatest possible values, i.e. budget of initiatives/healthcare. Expenditure should be as close as possible to 1, as it will be indicative of the country's commitment to longevity. The source for all the data for the analysis is World Bank, Governments' reports, World Economic Forum.



Employment rates are defined as a measure of the extent to which available labour resources (people available to work) are being used. Employment rates are sensitive to the economic cycle, but in the longer term they are significantly affected by government’s higher education and income support policies and by policies that facilitate employment of elders, women and disadvantaged groups.

The following **ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Employed, 55–59 (1=100%) - an indicator of employed people in the age group of 55-59 years.	Number of employed people of the age group/ total number of people in the age group of 55-59 years.
Employed, 60–64 (1=100%)- an indicator of employed people in the age group of 60-64 years.	Number of employed people of the age group/ total number of people in the age group of 60-64 years.
Employed, 65–69(1=100%)- an indicator of employed people in the age group of 65-69 years.	Number of employed people of the age group/ total number of people in the age group of 65-69 years.
Employed, 70-74 (1=100%)- an indicator of employed people in the age group of 70-74 years.	Number of employed people of the age group/ total number of people in the age group of 70-74 years.
Employed, 75+ (1=100%)- an indicator of employed people in the age group of 75 and older.	Number of employed people of the age group/ total number of people in the age group of 75 and older.

For the country to be considered as a leader in Employment among elderly, all five aforementioned metrics should as close to 1 as possible, which would mean that most of the people in the age group are employed and actively contributing to GDP growth.

The source for all the data for the analysis is National Bureaus of Statistics.



According to the WHO, DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences. The official calculation of DALY is  $YLL + YLD$ , where YLL corresponds to the number of deaths multiplied by the standard life expectancy at the age at which death occurs. The basic formula for YLL for a given cause, age and sex is  $YLL = N * L$ , where where N = number of deaths and L = standard life expectancy at age of death in years.

The following ratio metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
DALY rates per 100 000 population (2012 - WHO )	Disability-Adjusted Life Year/100 000 population

For the country to be considered as a leader in DALY the aforementioned metric should have the lowest possible value. Low DALY signifies a reduced tradeoff between longevity and health, also known as the ‘compression of morbidity’, is also an intended outcome of the longevity industry.

The source for all the data for the analysis is World Health Organization, Lancet reports.

It is necessary to create negative metrics to ensure that large failures in outcomes of government planning are recognised. An obvious example is senior poverty, which is an outcome which multiple government initiatives in each country are intended to prevent. The following **ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Senior poverty ratio (66 years-old or more, 2017)	Number of senior people whose income falls below the poverty line/total number of senior people
Number of initiatives with budgets failed to find	Number of initiatives with budgets failed to find
Social Security Insolvency	If a system has already run out of money or will run out till 2020, the value is 0.3. If a system is pointed toward insolvency between 2021 and 2040, the value is 0.2. If a system could become insolvent after 2041, the value is 0.1. Final Insolvency is the sum of all values of a particular country.
Total number retired	Total number retired
Retired people proportion, %	Retired people/population
DALY rates per 100 000 population (2012 - WHO )	Disability-Adjusted Life Year/100 000 population

For the country to be considered as a leader in planning for these potential negative outcomes, the aforementioned metric should have the lowest possible value (potentially 0). The ratio of over 65s in poverty should be as near to 0% as possible. The source for all the data for the analysis is World Bank, National Bureaus of Statistics.

Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Life expectancy could be considered as one of the most important measures of health. It is readily comparable across countries and indicates how well a government is doing in terms of healthcare improvements.

For the report there were used the following metrics that helped us identify the leaders in longevity:

Metric definition	Formula
Both sexes life expectancy, CAGR (5 years) - an indicator of life expectancy average annual growth over the last 5 years.	$(\text{Life expectancy 2018 value} / \text{Life expectancy 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Male life expectancy, CAGR (5 years) - an indicator of male life expectancy average annual growth over the last 5 years.	$(\text{Male life expectancy 2018 value} / \text{Male life expectancy 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Female life expectancy, CAGR (5 years) - an indicator of female life expectancy average annual growth over the last 5 years.	$(\text{Female life expectancy 2018 value} / \text{Female life expectancy 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
HALE CAGR (6 years) - an indicator of healthy life expectancy average annual growth over the last 6 years. It is a more useful and revealing metric compared with life expectancy CAGR.	$(\text{HALE 2016 value} / \text{HALE 2010 value})^{(1/6)} - 1$ , where 6 is the number of years between the start and finish values

For the country to be considered as a leader in life expectancy, it should have the maximum possible values in all four aforementioned metrics, i.e. both sexes life expectancy, CAGR (5 years) must be greater than zero, HALE CAGR (6 years) must be equal to the greatest possible number, as it is the most important metric in the category.

The source for all the data for the analysis is WHO Life tables, National National Bureaus of Statistics. Hong Kong is not included in the HALE analysis because there is no HALE data for the country.

Gross Domestic Product (GDP) is a broad measurement of a nation's overall economic activity. GDP is the monetary value of all the finished goods and services produced within a country's borders in a specific time period. GDP includes all private and public consumption, government outlays, investments, additions to private inventories, paid-in construction costs and the foreign balance of trade. It is still one of the primary indicators used to gauge the health of a country's economy.

The following **growth** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
GDP per Capita, Current Prices, CAGR (5 Years)	$(\text{GDP per capita, Current Prices 2018 value} / \text{GDP per capita, Current Prices 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
GDP per Capita, PPP, CAGR (5 Years)	$(\text{GDP per capita, PPP 2018 value} / \text{GDP per capita, PPP 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
GDP, Current Prices, CAGR (5 Years)	$(\text{GDP, Current Prices 2018 value} / \text{GDP, Current Prices 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values

For the country to be considered as a leader in GDP, all three aforementioned metrics should have the greatest possible values, i.e. GDP per Capita, Current Prices, CAGR (5 Years) must be greater than zero, as it would indicate the growing average living standards and economic well being.

The source for all the data for the analysis is World Bank.



Employment is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement. With an ageing society and increasing retirement age, more elders have to work. For older people to be able to work, they have to be in good health state. Furthermore, seniors are considered as a more qualified labor force than younger workers, and with upcoming “silver tsunami”, it is essential to utilize available resources in the most efficient way. The following **growth** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Number of people 65+ employed, CAGR (5 years) - an indicator of people aged 65+ employment annual growth rate increase for the last 5 years.	$(\text{Number of people 65+ employed in 2018} / \text{Number of people 65+ employed in 2013})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Average Growth of % of People in Workforce - an indicator of the country's labour force increase.	$(\% \text{ of People in Workforce 2017 value} - \% \text{ of People in Workforce 2007 value}) / \% \text{ of People in Workforce 2007 value}$
Rate of Population Aging (65+ Years), p.p. - an indicator of the country's older population growth	$(\text{Share of population aged 65+ in 2017} - \text{Share of population aged 65+ in 2007})$

For the country to be considered as a leader in employment among elderly, all three aforementioned metrics should have the greatest possible values, i.e. number of people 65+ employed, CAGR (5 years) must be greater than zero, average growth of % of people in workforce should be equal to the greatest possible number.

The source for all the data for the analysis is National National Bureaus of Statistics.

Healthcare efficiency measures whether healthcare resources are being used to get the best value for money, where the value of healthcare is as a means to improve health. Efficiency is concerned with the relation between resource inputs (costs, in the form of labour, capital, or equipment) and either intermediate outputs (numbers treated, waiting time, etc) or final health outcomes (lives saved, life years gained, quality adjusted life years (QALYs)). The following **growth** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Health Expenditure, CAGR (5 years) - an indicator of public health spending average annual growth increase for the last 5 years	$(\text{Health expenditure 2018 value} / \text{Health expenditure 2013 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Healthcare efficiency score, 5 years growth - an indicator of growth rate increase of a country's healthcare efficiency score for the last 5 years	$(\text{Efficiency score 2018 value} - \text{Efficiency score 2013 value}) / \text{Efficiency score 2013} - 1$

For the country to be considered as a leader in healthcare efficiency, it should have the maximum possible values in all two aforementioned metrics, i.e. Health Expenditure, CAGR (5 years) must be greater than zero, Healthcare efficiency score, 5 years growth must be equal to the greatest possible number, as it comprises the growth of life expectancy, relative and absolute cost of healthcare.

The source for all the data for the analysis is OECD, National National Bureaus of Statistics, Bloomberg Health Care Efficiency Index.

Population aging is a shift in the distribution of a country's population towards older ages. This is usually reflected in an increase in the population's mean and median ages, a decline in the proportion of the population composed of children, and a rise in the proportion of the population composed of elderly.

The following **growth rate of ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Age Dependency Ratio, CAGR (5 Years) - a compound annual growth rate of the ratio of older dependents--people older than 64--to the working-age population--those ages 15-64, for the last 5 years	$(\text{Age dependency ratio 2018 value} / \text{Age dependency ratio 2013 value})^{1/(5-1)} - 1$ , where 5 is the number of years between the start and finish values
Number of People Aged Over 65, CAGR (5 Years) - an indicator of aging population annual growth rate for the last 5 years	$(\text{Aged over 65 2018 value} / \text{Aged over 65 2013 value})^{1/(5-1)} - 1$ , where 5 is the number of years between the start and finish values
Growth of Population Aged 65+ / Population Growth, CAGR (5 Years) - an indicator of the relative growth rate of the aged population with regards to overall population growth.	$((\text{Population Aged 65+ 2018 value} / \text{Population 2018 value}) / (\text{Population Aged 65+ 2013 value} / \text{Population 2013 value}))^{1/5} - 1$ , where 5 is the number of years between the start and finish values

For the country to be considered as a leader in population ageing, the all three aforementioned metrics should have the least possible value, i.e. egd over 65, CAGR should be as close to zero as possible or even negative, age dependency ratio, CAGR should be as close to zero as possible or even negative, as this dependency ratio captures variations in the proportions of elderly people in the population that imply the dependency burden that the working-age population bears in relation to the elderly. The source for all the data for the analysis is World Bank, National Bureaus of Statistics.



# Methodology for Growth Rate of Ratios: Healthy Life Expectancy

HALE (health-adjusted life expectancy) refers specifically to the healthy number of years someone is expected to live at birth, which equals to their life expectancy minus the number of years expected to be lived in a state of illness or disability as opposed to life expectancy at birth that is defined as how long, on average, a newborn can expect to live, if current death rates do not change. **Therefore, HALE is a more useful and revealing metric compared with average life expectancy.**

The following **growth rate of ratio** metric was used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
HALE / Life Expectancy, CAGR (5 Years) - an indicator of whether HALE and life expectancy are converging (approaching each other), or diverging (i.e. life expectancy rising without an increase in HALE)	$(\text{HALE Life expectancy ratio 2015 value} / \text{HALE Life expectancy ratio 2010 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values

For the country to be considered as a leader in HALE, it should have the maximum possible values in the aforementioned metric, i.e. CAGR HALE/Life expectancy ratio must be greater than zero. It would indicate that HALE is growing at a faster rate than life expectancy, which means that the country is taking successful steps to enhance the health of its citizens by promoting a healthy lifestyle, implementing preventive, precision and personalized medicine.

The source for all the data for the analysis is WHO Life tables.

Health spending measures the final consumption of health care goods and services (i.e. current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. The following **growth rate of ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Healthcare Expenditure per capita, CAGR (5 years) - estimates compound annual growth rate of current Expenditure on health per capita for the last 5 years.	$(\text{Healthcare Expenditure per capita 2017 value} / \text{Healthcare Expenditure per capita 2012 value})^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Healthcare Expenditure per capita/Government spending, CAGR (5 years) - estimates the annual growth rate of share of health spending in general government spending.	$((\text{Healthcare Expenditure per capita 2017 value} / \text{Government spending 2017 value}) / (\text{Healthcare Expenditure per capita 2012 value} / \text{Government spending 2012 value}))^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values
Healthcare Expenditure/GDP per capita, CAGR (5 years) - an indicator of annual growth rate of healthcare spending in relation to GDP per capita.	$((\text{Healthcare Expenditure 2017 value} / \text{GDP per capita 2017 value}) / (\text{Healthcare Expenditure 2012 value} / \text{GDP per capita 2012 value}))^{(1/5)} - 1$ , where 5 is the number of years between the start and finish values

For the country to be considered as a leader in Healthcare Expenditure, all three aforementioned metrics must be bigger than zero, as that would indicate a country's commitment to an increasing health spending. The source for all the data for the analysis is National National Bureaus of Statistics, World Bank.



HALE (health-adjusted life expectancy) is a measure of population health that takes into account mortality and morbidity. It adjusts overall life expectancy by the amount of time lived in less than perfect health. This is calculated by subtracting from the life expectancy a figure which is the number of years lived with disability multiplied by a weighting to represent the effect of the disability.

The following **effectiveness ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
HALE CAGR (5 years)/Health Expenditure per capita (current US\$), CAGR (5 years)	$\frac{((\text{HALE Life expectancy ratio 2015 value} / \text{HALE Life expectancy ratio 2010 value})^{(1/5)} - 1)}{((\text{Healthcare Expenditure per capita 2017 value} / \text{Healthcare Expenditure per capita 2012 value})^{(1/5)} - 1)}$

The comparison of HALE CAGR to the one of Health Expenditure per capita CAGR is crucial for understanding what value of health Expenditure is needed for the increase of Healthy Life expectancy. Also, it allows to compare the growth of these two indicators.

For the country to be considered as a leader in HALE, the aforementioned metric should have the greatest possible value, i.e. HALE CAGR (5 years)/Health Expenditure per capita (current US\$) should have the highest ratio. **Special weighting is given to this metric as it signifies the extent to which increased health is producing longer lives and it is therefore a crucial metric in the ranking of longevity national development plans.**

The source for all the data for the analysis is World Health Organization.

The term "life expectancy" refers to the number of years a person can expect to live. By definition, life expectancy is based on an estimate of the average age that members of a particular population group will be when they die.

Life expectancy is one of the key measures of a population's health, and an indicator used widely by policymakers and researchers to complement economic measures of prosperity, such as GDP per capita.

The following **effectiveness ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Life expectancy CAGR (5 years)/Health expenditure per capita (current US\$), CAGR (5 years)	$\left( \frac{\text{Healthcare Expenditure per capita 2017 value}}{\text{Healthcare Expenditure per capita 2012 value}} \right)^{\frac{1}{5}} - 1 \div \left( \frac{\text{Life expectancy 2018 value}}{\text{Life expectancy 2013 value}} \right)^{\frac{1}{5}} - 1$
Life expectancy CAGR (5 years)/GDP per capita, PPP, CAGR (5 years)	$\left( \frac{\text{Life expectancy 2018 value}}{\text{Life expectancy 2013 value}} \right)^{\frac{1}{5}} - 1 \div \left( \frac{\text{GDP per capita 2017 value}}{\text{GDP per capita 2012 value}} \right)^{\frac{1}{5}} - 1$

The growth of life expectancy is compared with two major economic indicators - health expenditure per capita and GDP per capita. This allows to evaluate the cost of the increase in life expectancy. For the country to be considered as a leader in government planning for life expectancy, the aforementioned two metrics must be as high as possible.

**Special weighting is given to this metric as the outcome of increased life expectancy is a key part of the end product of the longevity industry.**

The source for all the data for the analysis is World Bank, World Health Organization.





Dramatic advances in healthcare have extended the lives of people in, predominantly, first-world and developed countries. That means that without adequate personal savings and/or pensions, people could easily outlive their retirement funds. In times of economic downturn retirees may choose to "come out of retirement" and re-enter the workforce on a seasonal, part-time or full-time basis to earn income and obtain benefits, especially costly health insurance coverage.

The following **effectiveness ratio** metrics were used in this report to identify the leaders in longevity government planning.

Metric definition	Formula
Number of Employed People Aged 65+, CAGR (5 Years) / Health Expenditures per Capita, CAGR (5 Years) - an indicator of relative growth rate of elders employed with regards to health expenditures per capita	$\frac{((\text{Number of Employed People Aged 65+ in 2017} / \text{Number of Employed People Aged 65+ in 2012})^{(1/5)} - 1)}{((\text{Health Expenditures per Capita 2017 value} / \text{Health Expenditures per Capita 2012 value})^{(1/5)} - 1)}$

For the country to be considered as a leader in employment among the aging population, the aforementioned metric should have the greatest possible value, i.e. HALE CAGR (5 years)/Health Expenditure per capita (current US\$) should be greater than one, as it would indicate that employment among elderly is rising at a faster rate than health expenditures, which, in turn, means that the country’s economy is benefitting and the elders are in a good health condition to be able to work after retirement. **Special weighting is given to this metric as it signifies the extent to which increased health is producing longer lives and it is therefore a crucial metric in the ranking of longevity national development plans.**

The source for all the data for the analysis is National Bureaus of Statistics, OECD, World Bank.



Weighting factors were chosen according to the relative importance of different ranking parameters, which was evaluated both quantitatively and qualitatively.

Weightings values vary from 1 to -0,5, where value of 1 reflects high importance of factor and -0,5 reflects high negative impact of a factor on the ranking. More specifically, weightings values can be described as following:

Weight factor value	Description
1	Extremely high importance, factors of strategic influence, parameters that enable countries to make fast and strong progress in Longevity Development Initiatives.
0,5	Factors which are also extremely essential for successful and tangibly effective Longevity Development Initiatives but cannot be described as the most important ones.
0,2 - 0,4	Factors that reflect high level of positive impact on Longevity Development Initiatives or the results thereof.
0,1 - 0,2	Factors that reflect high level of positive impact on Longevity Development Initiatives or the results of the development but do not have strategic importance.
0,05 - 0,01	Positive factors with slightly observable impact.
0,01 - 0	Positive factors which impact cannot be described as definitely observable.
-0,01 - (-0,05)	Negative factors which impact cannot be described as definitely observable.
<-0,05	Negative factors with essential negative impact on Longevity Development Initiatives.



Process of weight factors evaluation can be described in general as combination and integration of qualitative research, data analysis, statistical and econometric methods and adjustments of these results based on the logical and empirical consistency considerations. Methodology for the evaluation of weight factors can be described in the following way.

Stage	Description
1	Analysis of government longevity national plans. Investigation of strengths, weaknesses, threats and opportunities of different countries and regions regarding longevity national development. Analysis of social, economic and technological prospects of the countries in the scope of the topic.
2	Qualitative estimation of the importance of weight factors based on the investigation of evidence of longevity national development. Segregation of factor types. Determination of different levels of importance.
3	Assignment of quantitative values to the factors based on the qualitative results of the analysis of their importance.
4	Adjustment of the values based on the statistical data on countries.
5	Adjustment of the values based on historical development trends.
6	Comparison and integration of different approaches for the development of the final weight factors distribution.
7	Weight factors testing through the development of the final ranking of the countries.

Further adjustment and expansion of weight factors can be conducted through the analysis of statistics on additional countries, more comprehensive analysis of historical data and applying new approaches for the estimation of final country scores in order to compare them with the results provided by implementation of the weight factors.

Further extensions in methodology will relate to all aspects of our proprietary ranking system, namely:

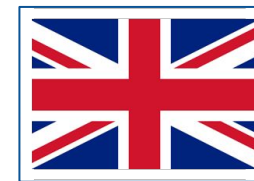
- Expanding the number of metrics parameters, as well as their categorization.
- Adjustment of weight factors in accordance with new statistics on investigated countries.
- Expanding the final ranking of countries and dividing them also into specific categories.
- Improving the distributions of the parameters, creating new levels and categories of metrics.

First edition	Second edition
12 countries or regions	More than 30 countries or regions
77 metrics and parameters	More than 100 metrics and parameters
6 levels of parameters	8 levels of parameters, some of which are regrouped
1 approach for weights assignment	3 approaches for weights assignment

One of the foremost challenges faced during the production of this first edition of the report was the large volume of data, as well as gaps in data for different countries, which necessitated in many cases the manual aggregation and parsing of data, due to a lack consistent resources for the standardization of statistical data across many countries. To overcome these challenges and enable an even deeper level of analysis, from the third edition and onward advanced statistics and machine learning tools will be applied to automate aggregation of data, increase the scope and tangibility of insights derived from the analysis and to reveal trends otherwise hidden underneath the large volumes of unstructured data. This will enable aggregation of even larger quantities of data without burdening the clear and pragmatic analysis of that data, allowing sophisticated cross-sector analysis of tens of different countries and regions in an efficient manner.

The background features a dark blue image of the Earth, showing the continents of Africa and Europe. A network of thin white lines and dots is overlaid on the globe, suggesting a global or digital theme. A thick yellow frame with L-shaped corner pieces surrounds the central text area.

# **Longevity Initiatives Classification and Level of Comprehensiveness**



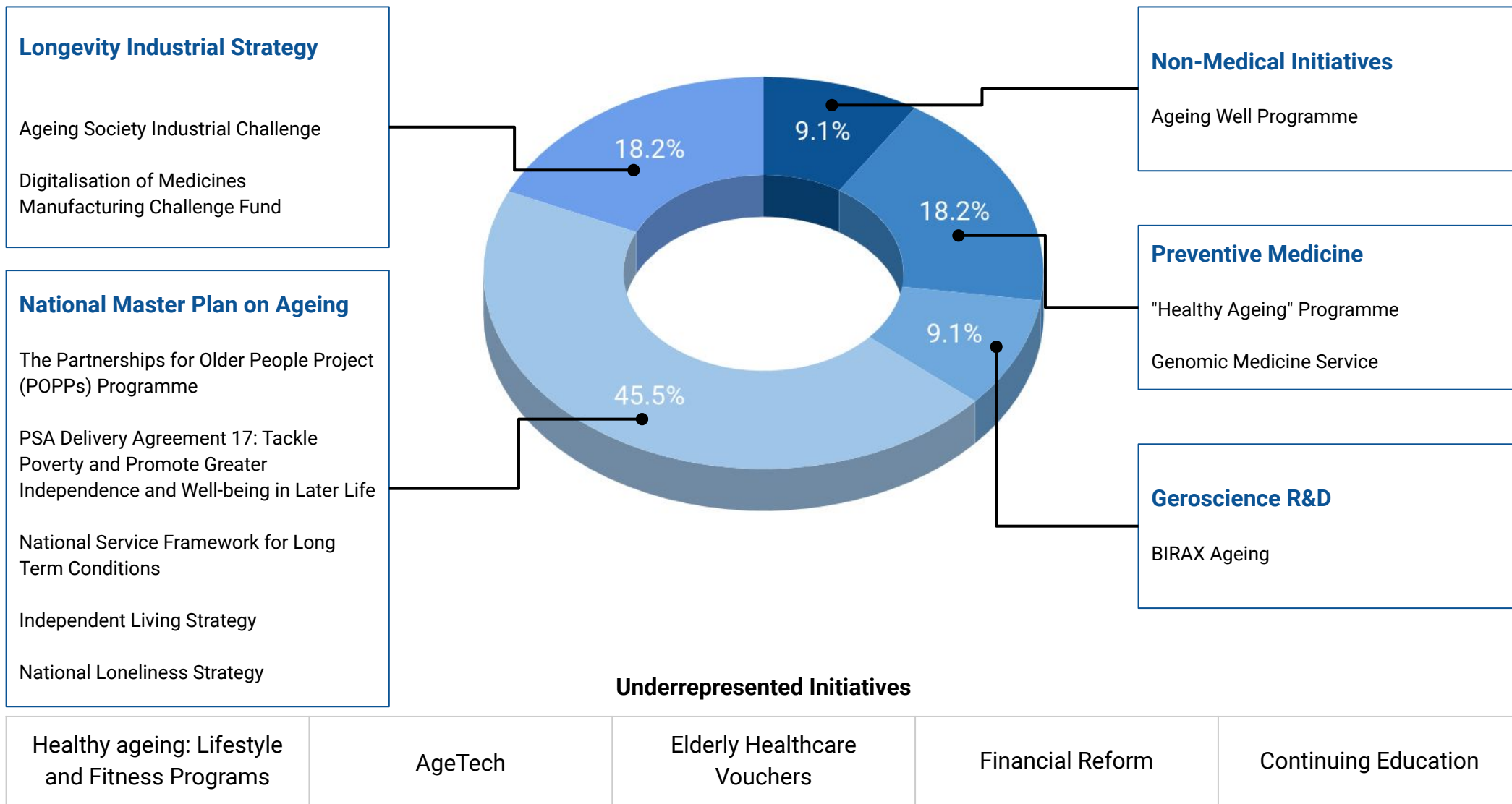
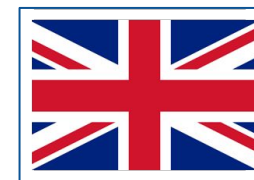
Life Expectancy	Both sexes life expectancy (2019)	81 years
	Male life expectancy (2018)	79.7 years
	Female life expectancy (2018)	83.2 years
GDP	GDP per capita, current prices (2018)	42.31 thousand (\$)
	GDP per capita, PPP (2018)	46.78 thousand (\$)
	GDP, current prices (2018)	2,830 billion (\$)
Population ageing	Rate of population ageing	2.2 (2007-2017)
	Aged over 65 (2018)	18.5%
	Age dependency ratio (2017)	29%
Healthcare Efficiency	Health expenditure (2017)	9.6% of GDP
	Health expenditure per capita (2017)	4.246 thousand (\$)
	Healthcare efficiency score (2018)	58.9
Retirement	Total # retired	12,225,489
	Retired people proportion	19%
	Retirement age (Early/Normal)	65 years/68 years

## Longevity Initiatives



- Age of relevant initiatives: **14 years**
- **23** of WHO age-friendly cities and communities
- £300 million **National Longevity Industrial Strategy**
- **8** initiatives focused on non-medical improvement of quality of life
- **3** initiatives focused on preventive medicine and healthcare approaches
- **1** initiative involves research or R&D of medicines that directly impact on ageing



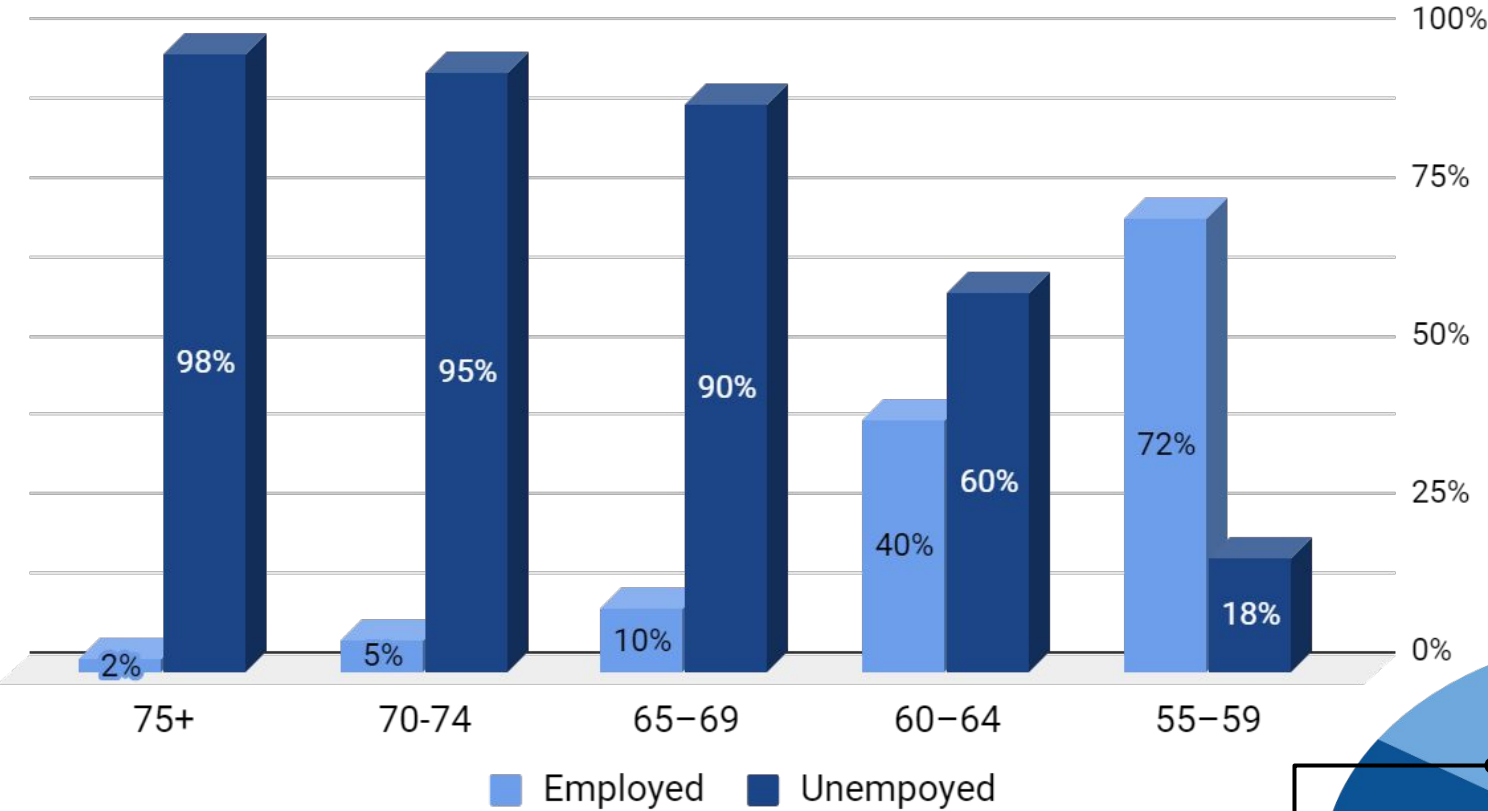




# United Kingdom Age/Employment Range

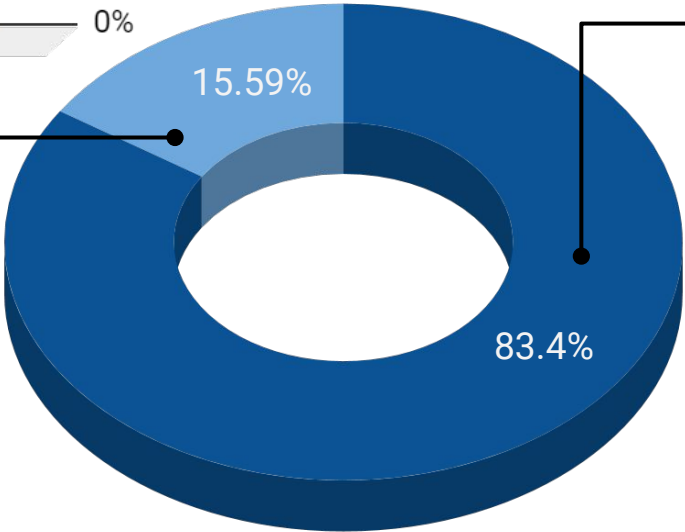


Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





Life Expectancy	Both sexes life expectancy (2019)	81.6 years
	Male life expectancy (2018)	80.0 years
	Female life expectancy (2018)	83.2 years
GDP	GDP per capita, current prices (2018)	53.02 thousand (\$)
	GDP per capita, PPP (2018)	58.25 thousand (\$)
	GDP, current prices (2018)	914 billion (\$)
Population Ageing	Rate of population ageing	4 (2007-2017)
	Aged over 65 (2018)	19.1%
	Age dependency ratio (2017)	29%
Healthcare Efficiency	Health expenditure (2017)	10.1% of GDP
	Health expenditure per capita (2017)	5.386 thousand (\$)
	Healthcare efficiency score (2018)	50.8
Retirement	Total # retired	3 217 307
	Retired people proportion	19%
	Normal retirement age (Man/Woman)	67 years / 65 years
	Early retirement age (Man/Woman)	52 years / 52 years

## Longevity Initiatives

- Age of relevant initiatives: **12 years**
- **National Master Plan on Ageing**
- **12** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- Dedicated minister for elderly



# Netherlands Initiatives Level of Comprehensiveness



## AgeTech

My Home Fits Program  
Deltaplan for Dementia  
Dementia Villages Plan

## Financial Reform

Increase in Pension AOW Age

## National Master Plan on Ageing

Dutch National Care for the Elderly Programme

## Healthy Ageing: Lifestyle and Fitness Programs

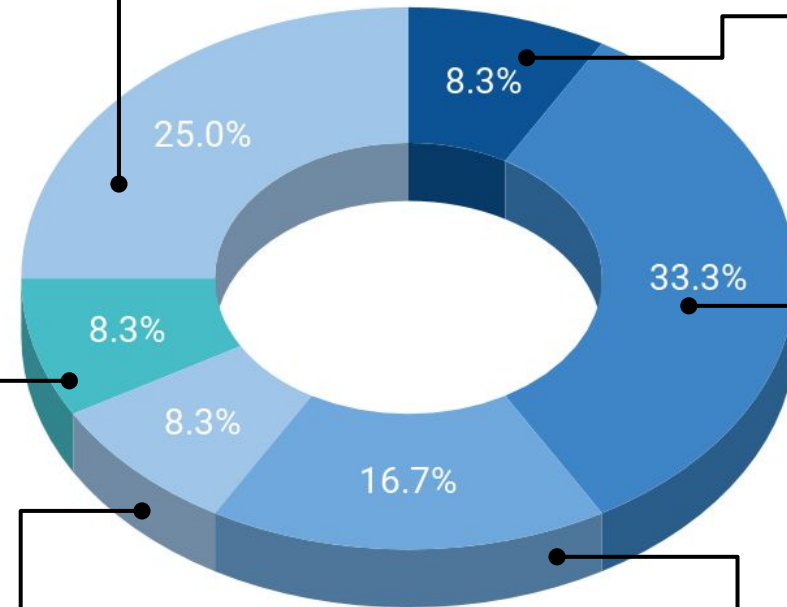
Groningen Active Ageing Strategy

## Non-Medical Initiatives

HANNN - Healthy Ageing Network Northern Netherlands  
Social Network for Older People (Perspective for 50 plus)  
Pact for Elderly Care  
Fighting loneliness among elderly

## Elderly Healthcare Vouchers

Dignity and Pride (D&P), Loving Care for Our Elderly  
"Gilde Nederland"



## Underrepresented Initiatives

Longevity Industrial Strategy

Continuing Education

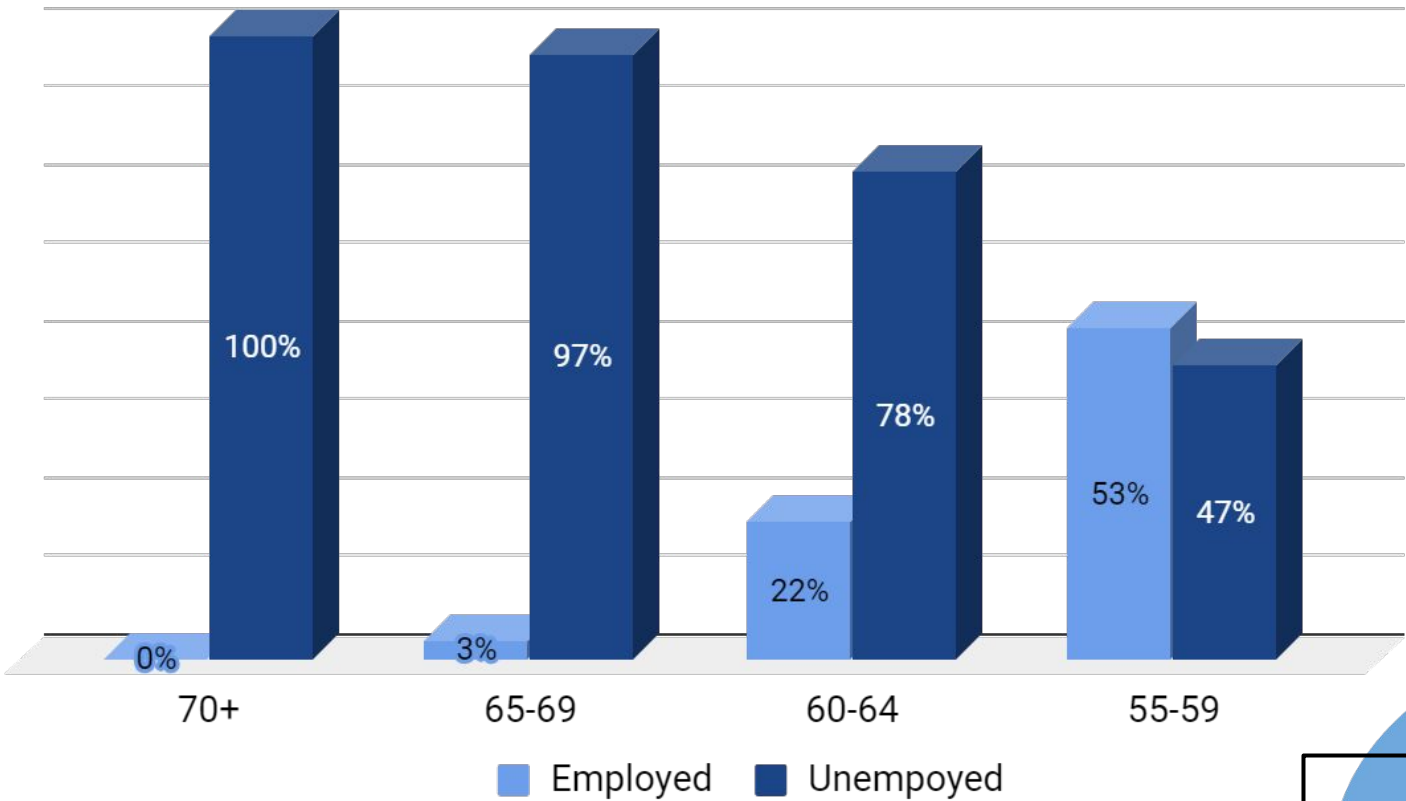


# Netherlands Age/Employment Range



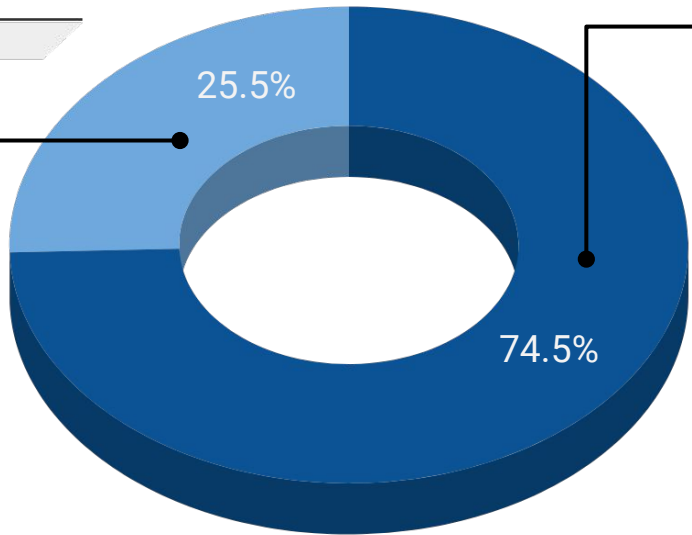
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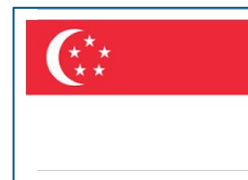
Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





Life Expectancy	Both sexes life expectancy (2019)	85.7 years
	Male life expectancy (2018)	80.8 years
	Female life expectancy (2018)	86.1 years
GDP	GDP per capita, current prices (2018)	65.63 thousand (\$)
	GDP per capita, PPP (2018)	103.72 thousand (\$)
	GDP, current prices (2018)	372.81 billion (\$)
Population Ageing	Rate of population ageing	6 (2007-2017)
	Aged over 65 (2018)	18.8%
	Age dependency ratio (2017)	18%
Healthcare Efficiency	Health expenditure (2017)	2.2% of GDP
	Health expenditure per capita (2017)	1.948 thousand (\$)
	Healthcare efficiency score (2018)	85.6
Retirement	Total # retired	725 193
	Retired people proportion	13%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	62 years / 62 years

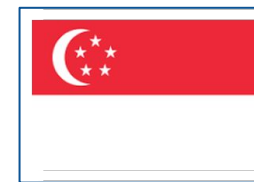
## Longevity Initiatives

- Age of relevant initiatives: **12 years**
- **15** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **1** initiative involves research or R&D of medicines that directly impact on ageing





# Singapore Initiatives Level of Comprehensiveness



## Non-Medical Initiatives

Senior Citizen Concession Card  
National Innovation Challenge on Active and Confident Ageing Research

## National Master Plan on Ageing

Action Plan for Successful Ageing

## Continuing Education

Media Development Authority Striving to Improve Elderly Digital Literacy  
National Population and Talent Division's SkillsFuture Program  
Re-employment of Older Workers Guidance

## Financial Reform

Lease Buyback Scheme (LBS)  
Medisave

## Geroscience R&D

Singapore Parkinson's Disease Translational Clinical Programme

## Preventive Medicine

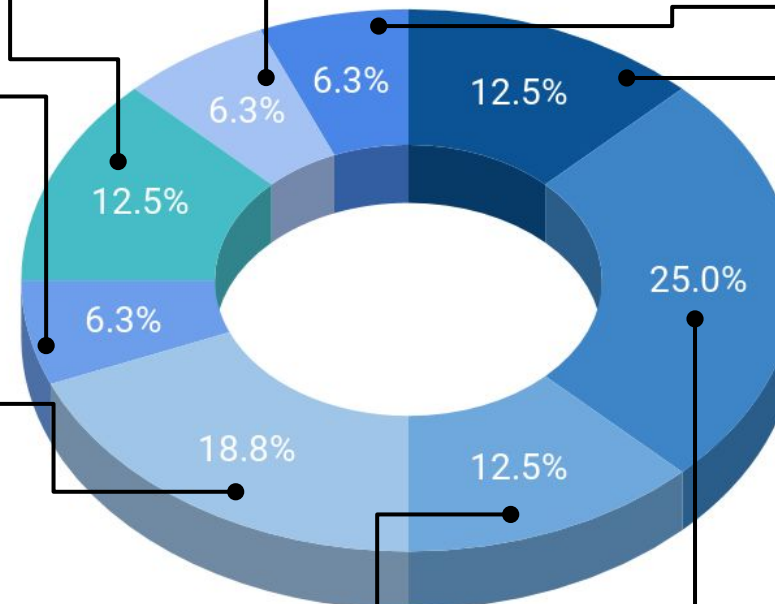
"Advancing Precision Medicine for Cardiovascular Disease and Diabetes in Asian Populations" programme

## AgeTech

SHINESeniors Program  
Licensing Experimentation and Adaptation Programme

## Elderly Healthcare Vouchers

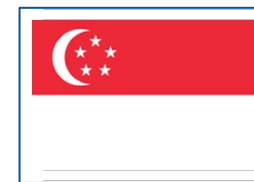
ComCare Long Term Assistance (also known as Public Assistance)  
Enhancement for Active Seniors (EASE)  
Pioneer Generation Package  
Silver Support Scheme



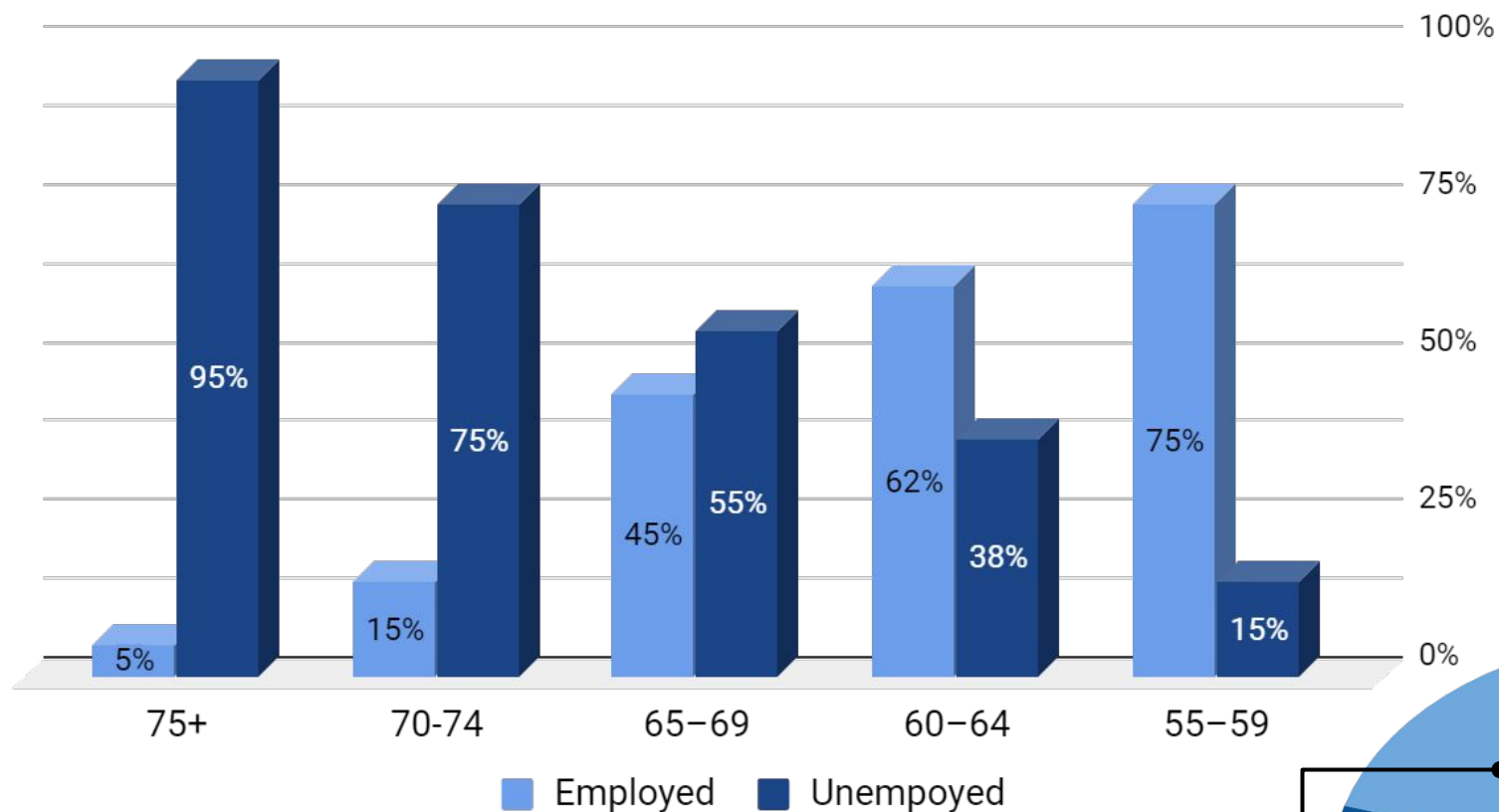
## Underrepresented Initiatives

Longevity Industrial Strategy

Healthy Ageing: Lifestyle and Fitness Programs

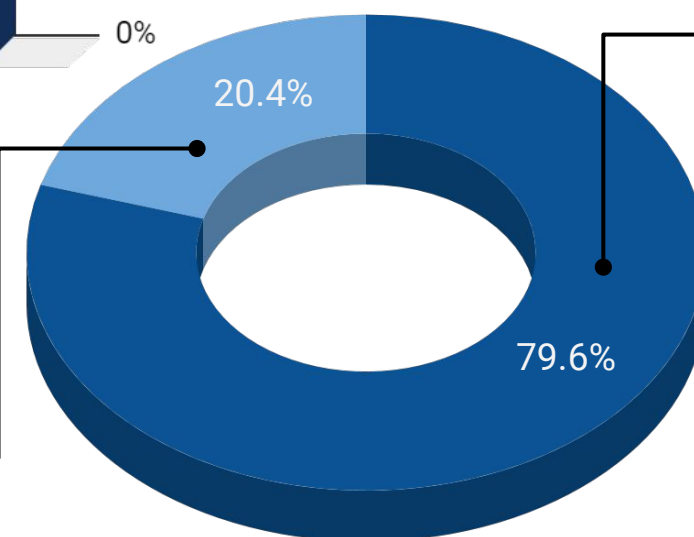


## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





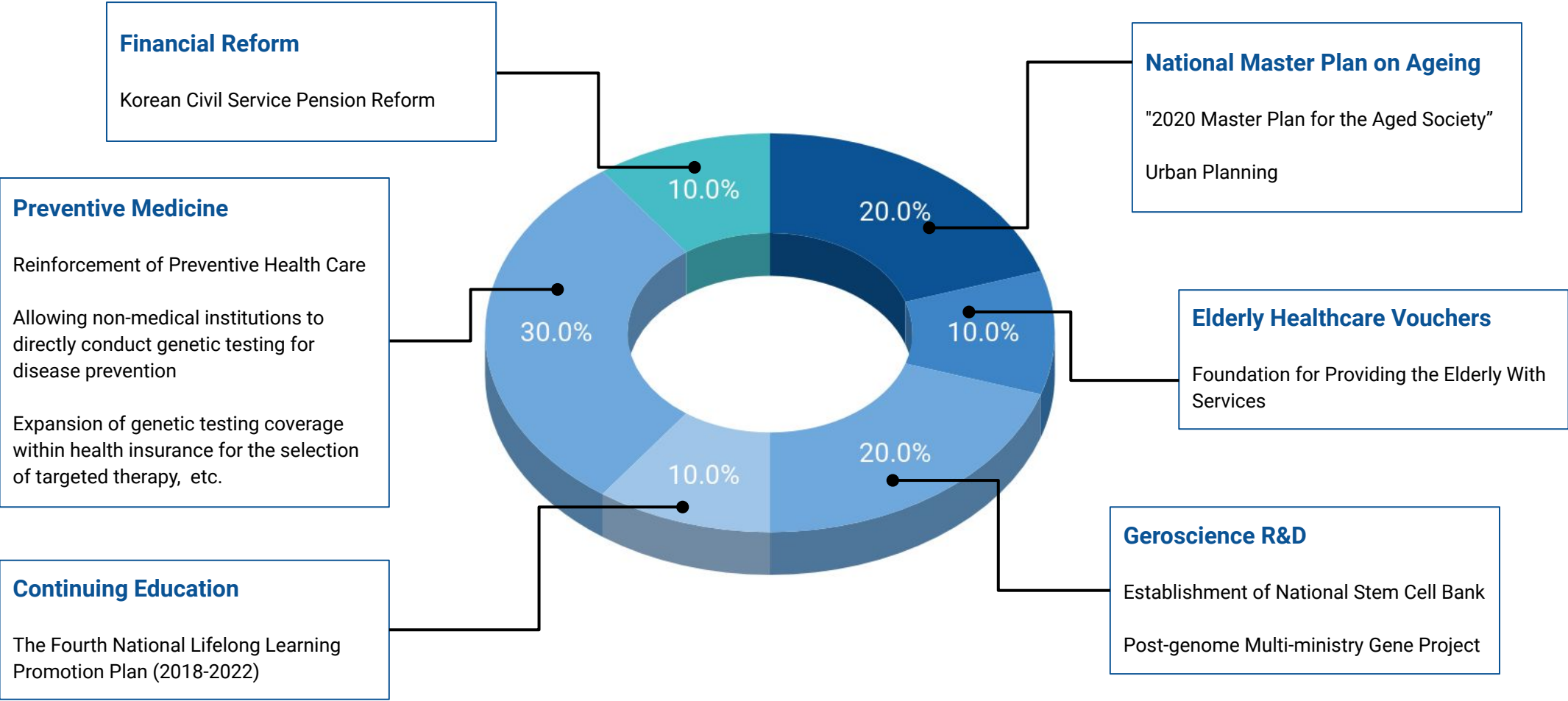
Life Expectancy	Both sexes life expectancy (2019)	80.9 years
	Male life expectancy (2018)	79.5 years
	Female life expectancy (2018)	85.6 years
GDP	GDP per capita, current prices (2018)	31.94 thousand (\$)
	GDP per capita, PPP (2018)	42.98 thousand (\$)
	GDP, current prices (2018)	1 660 billion (\$)
Population Ageing	Rate of population ageing	4.3 (2007-2017)
	Aged over 65 (2018)	14.2%
	Age dependency ratio (2017)	19%
Healthcare Efficiency	Health expenditure (2017)	7.6% of GDP
	Health expenditure per capita (2017)	2.897 thousand (\$)
	Healthcare efficiency score (2018)	67.4
Retirement	Total # retired	7 161 073
	Retired people proportion	14%
	Normal retirement age (Man/Woman)	60 years/ 60 years
	Early retirement age (Man/Woman)	50 years/ 50 years

## Longevity Initiatives

- Age of relevant initiatives: **9 years**
- **11** of WHO age-friendly cities and communities
- **3** initiatives focused on non-medical improvement of quality of life
- **2** initiatives focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



# South Korea Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

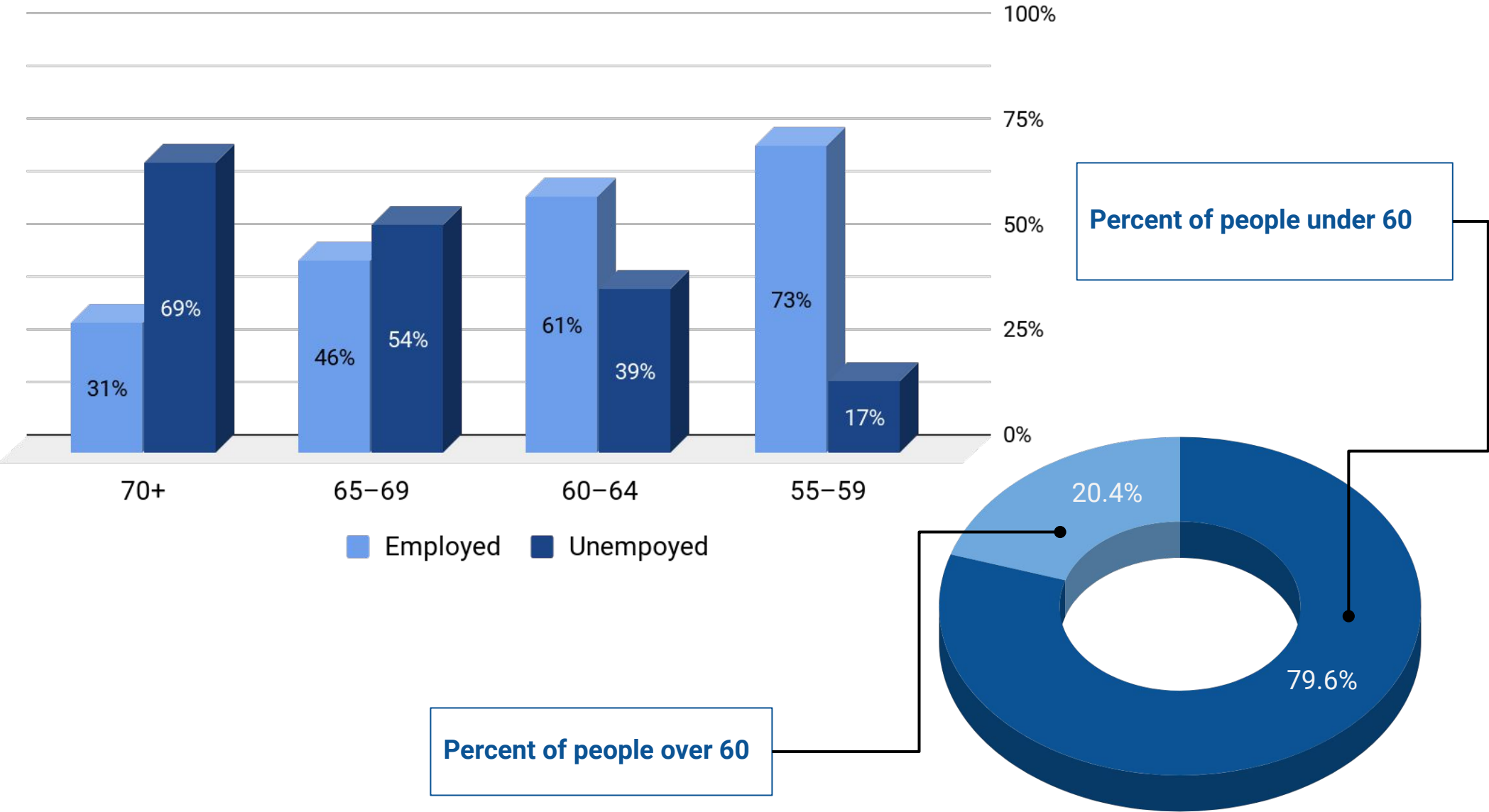
Healthy Ageing: Lifestyle and Fitness Programs	Non-Medical Initiatives	Longevity Industrial Strategy	AgeTech
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# South Korea Age/Employment Range



Fraction of the Unemployed by Age





Life Expectancy	Both sexes life expectancy (2019)	81.8 years
	Male life expectancy (2018)	80.3 years
	Female life expectancy (2018)	84.2 years
GDP	GDP per capita, current prices (2018)	42.14 thousand (\$)
	GDP per capita, PPP (2018)	36.16 thousand (\$)
	GDP, current prices (2018)	381.57 billion (\$)
Population Ageing	Rate of population ageing	1.9 (2007-2017)
	Aged over 65 (2018)	11.7%
	Age dependency ratio (2017)	19%
Healthcare Efficiency	Health expenditure (2017)	7.4% of GDP
	Health expenditure per capita (2017)	2.834 thousand (\$)
	Healthcare efficiency score (2018)	67.0
Retirement	Total # retired	1 022 251
	Retired people proportion	12%
	Normal retirement age (Man/Woman)	70 years/67 years
	Early retirement age (Man/Woman)	63.3 years/68.3 years

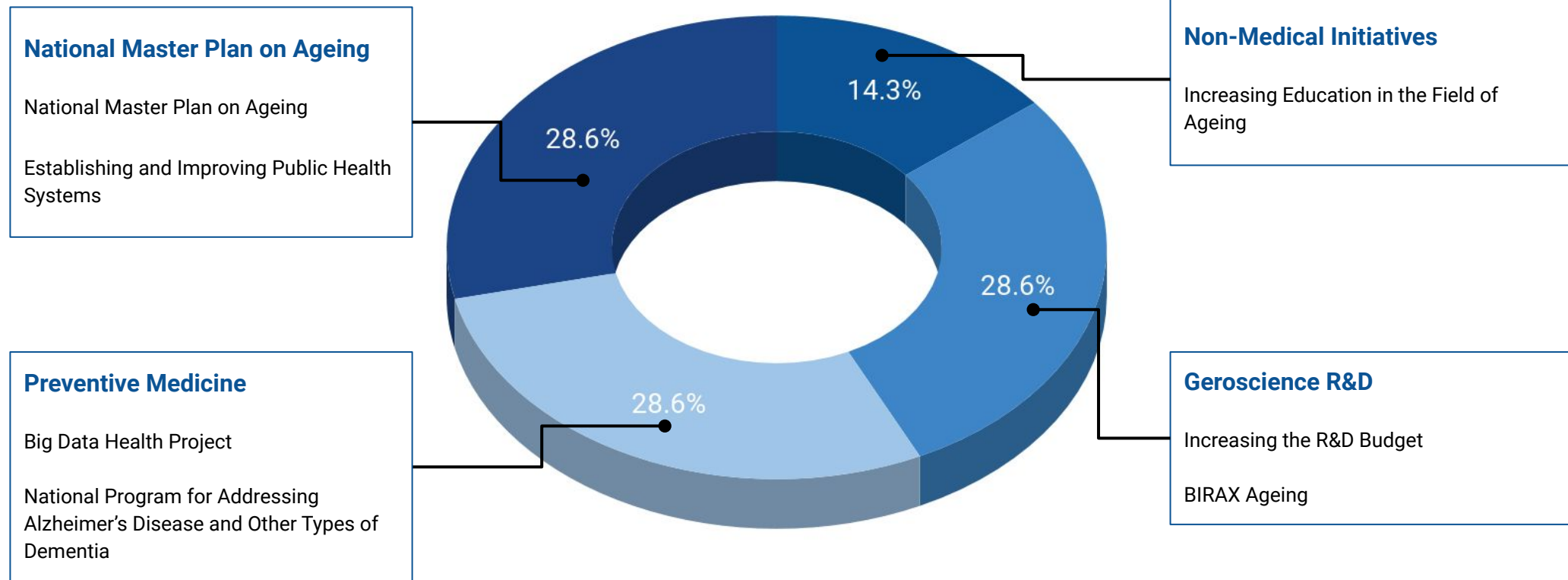
## Longevity Initiatives

- Age of relevant initiatives: **30 years**
- **4** of WHO age-friendly cities and communities
- **2** initiatives focused on the non-medical improvement of quality of life
- **2** initiatives focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing





# Israel Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

Healthy Ageing: Lifestyle and Fitness Programs	AgeTech	Longevity Industrial Strategy	Elderly Healthcare Vouchers	Financial Reform	Continuing Education
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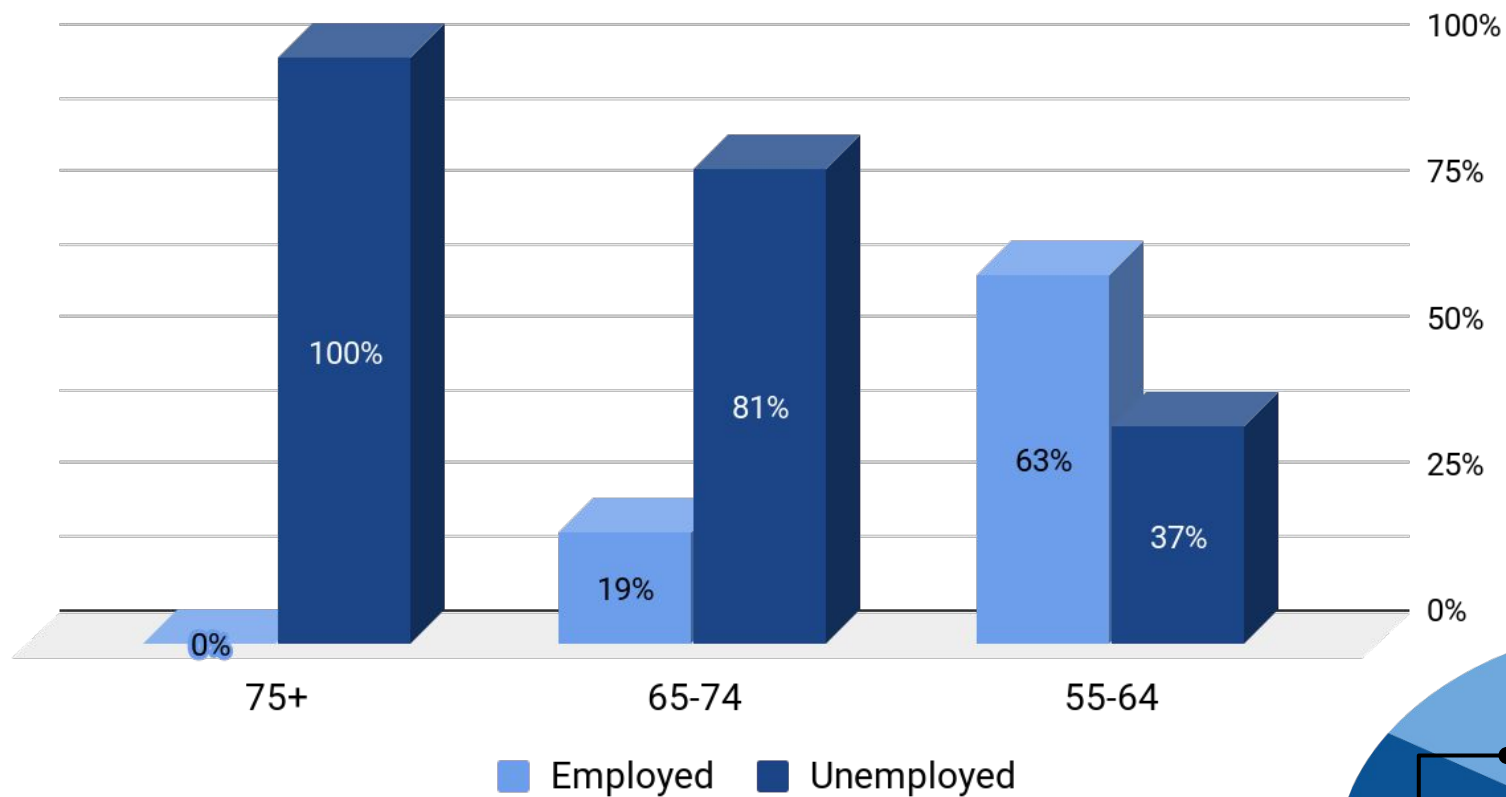


# Israel Age/Employment Range



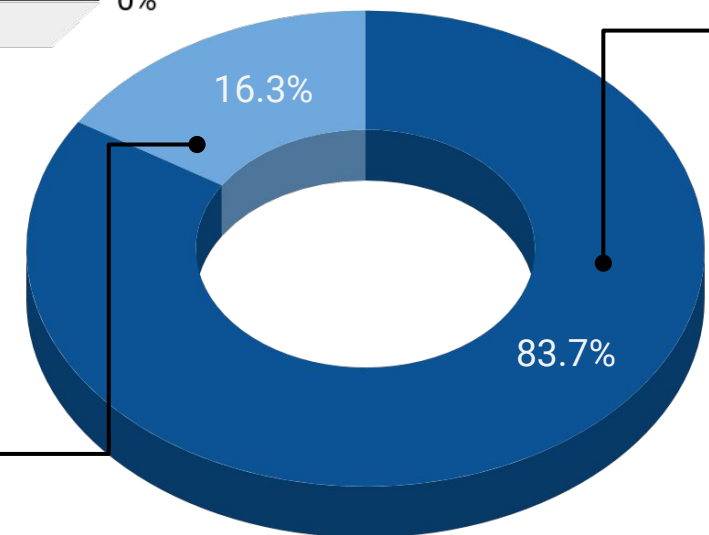
109

## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





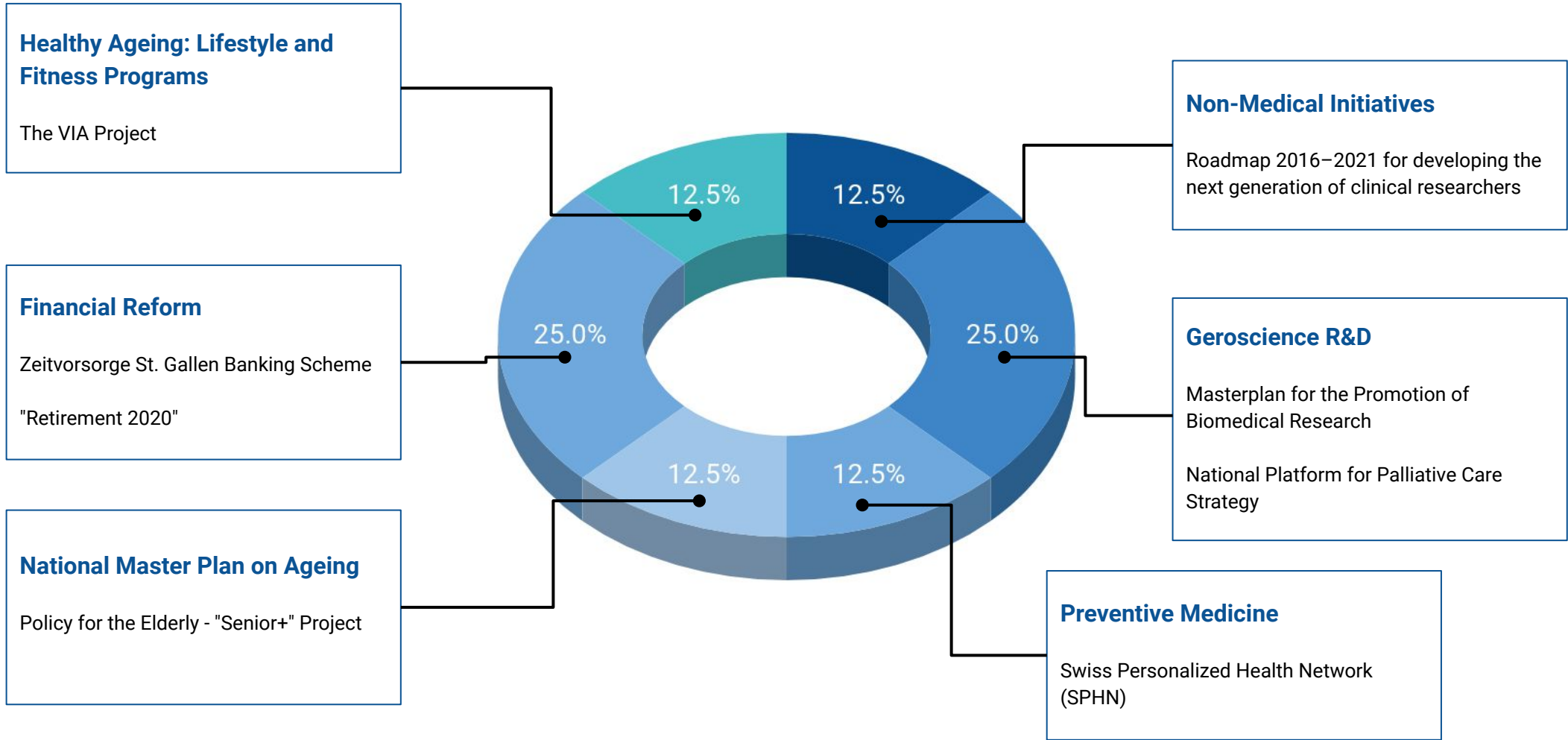
Life Expectancy	Both sexes life expectancy (2019)	81.8 years
	Male life expectancy (2018)	81.2 years
	Female life expectancy (2018)	85.2 years
GDP	GDP per capita, current prices (2018)	82.41 thousand (\$)
	GDP per capita, PPP (2018)	65.71 thousand (\$)
	GDP, current prices (2018)	707.54 billion (\$)
Population Ageing	Rate of population ageing	1.9 (2007-2017)
	Aged over 65 (2018)	18.34%
	Age dependency ratio (2017)	28%
Healthcare Efficiency	Health expenditure (2017)	12.3% of GDP
	Health expenditure per capita (2017)	8.009 thousand (\$)
	Healthcare efficiency score (2018)	58.4
Retirement	Total # retired	1 560 790
	Retired people proportion	18%
	Normal retirement age (Man/Woman)	65 years/ 64 years
	Early retirement age (Man/Woman)	63 years/ 61 years

## Longevity Initiatives

- Age of relevant initiatives: **15 years**
- **3** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



# Switzerland Initiatives Level of Comprehensiveness

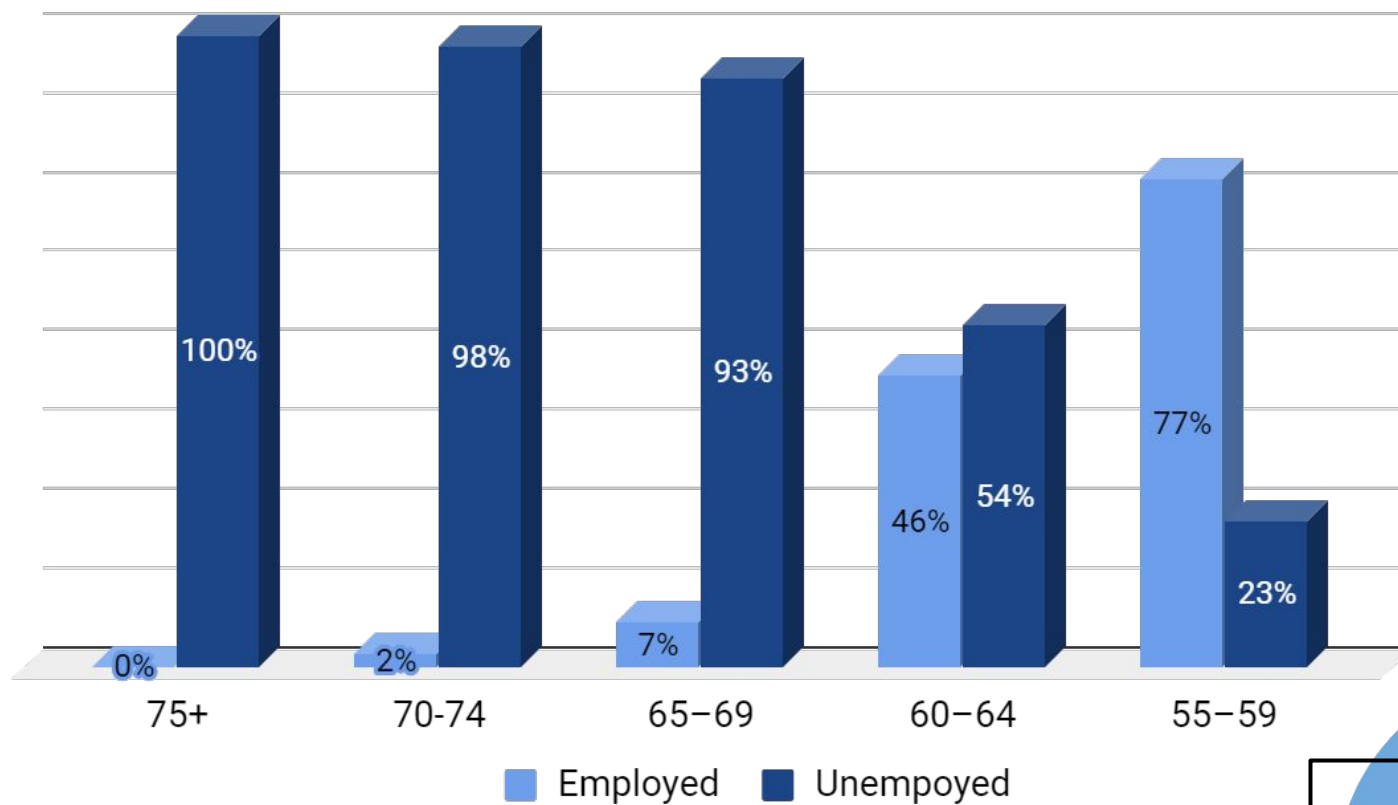


## Underrepresented Initiatives

AgeTech	Elderly Healthcare Vouchers	Longevity Industrial Strategy	Continuing Education
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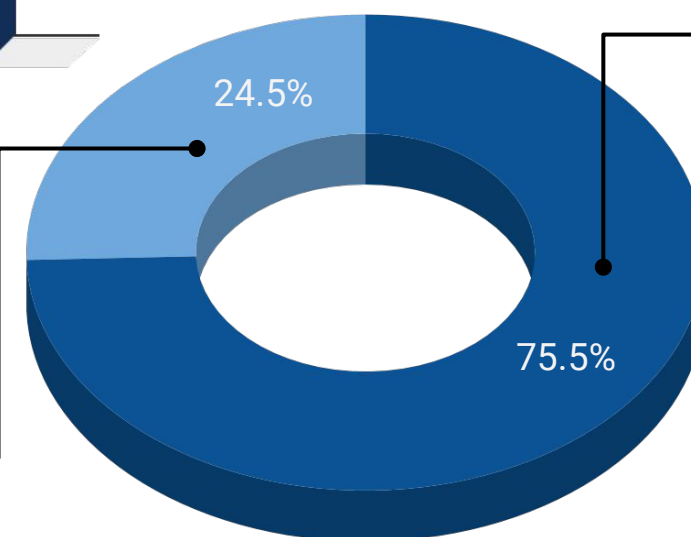


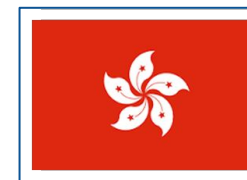
## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





Life Expectancy	Both sexes life expectancy (2019)	82.7 years
	Male life expectancy (2018)	80.4 years
	Female life expectancy (2018)	85.53 years
GDP	GDP per capita, current prices (2018)	50.54 thousand (\$)
	GDP per capita, PPP (2018)	66.52 thousand (\$)
	GDP, current prices (2018)	381.72 billion (\$)
Population Ageing	Rate of population ageing	3.8 (2007-2017)
	Aged over 65 (2018)	17.4%
	Age dependency ratio (2017)	23%
Healthcare Efficiency	Health expenditure (2017)	6.2% of GDP
	Health expenditure per capita (2017)	3.670 thousand (\$)
	Healthcare efficiency score (2018)	87.3
Retirement	Total # retired	1 205 056
	Retired people proportion	16%
	Normal retirement age (Man/Woman)	65 years/ 65 years
	Early retirement age (Man/Woman)	65 years/ 65 years

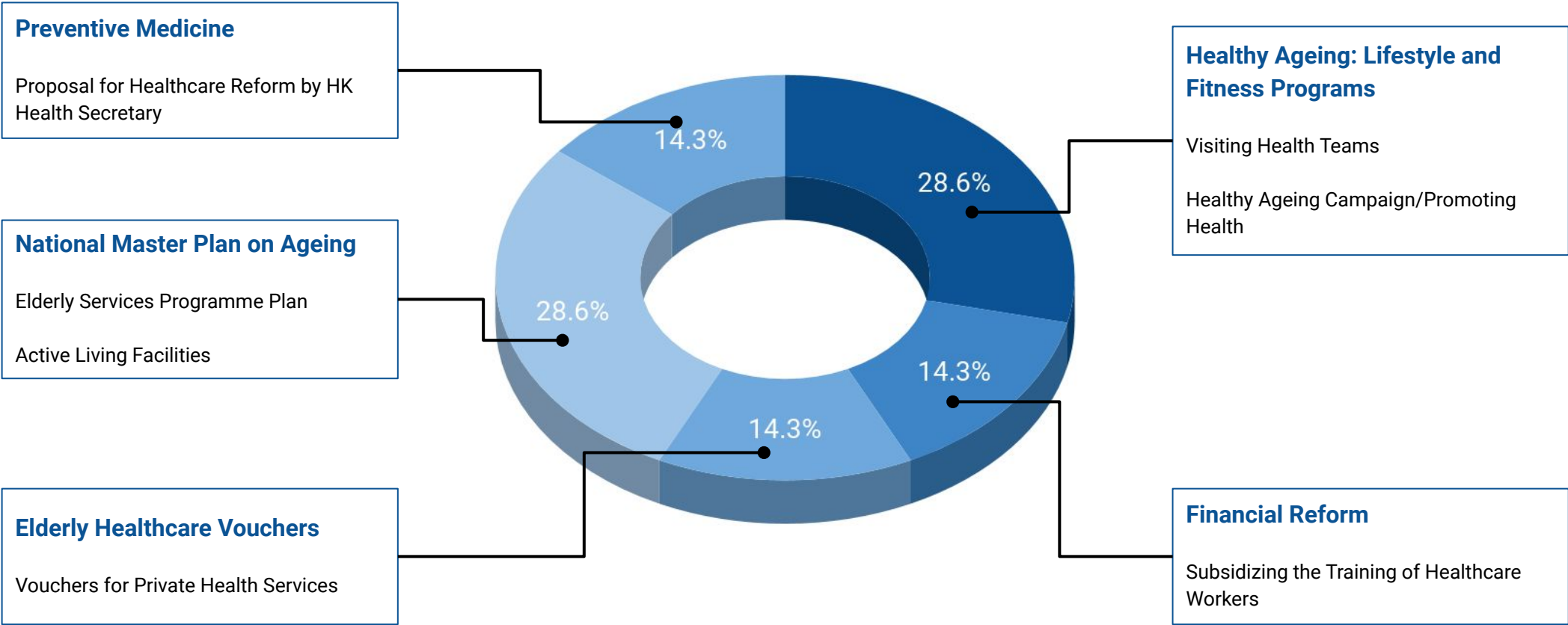
## Longevity Initiatives

- Age of relevant initiatives: **20 years**
- **9** of WHO age-friendly cities and communities
- **6** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches





# Hong Kong Initiatives Level of Comprehensiveness



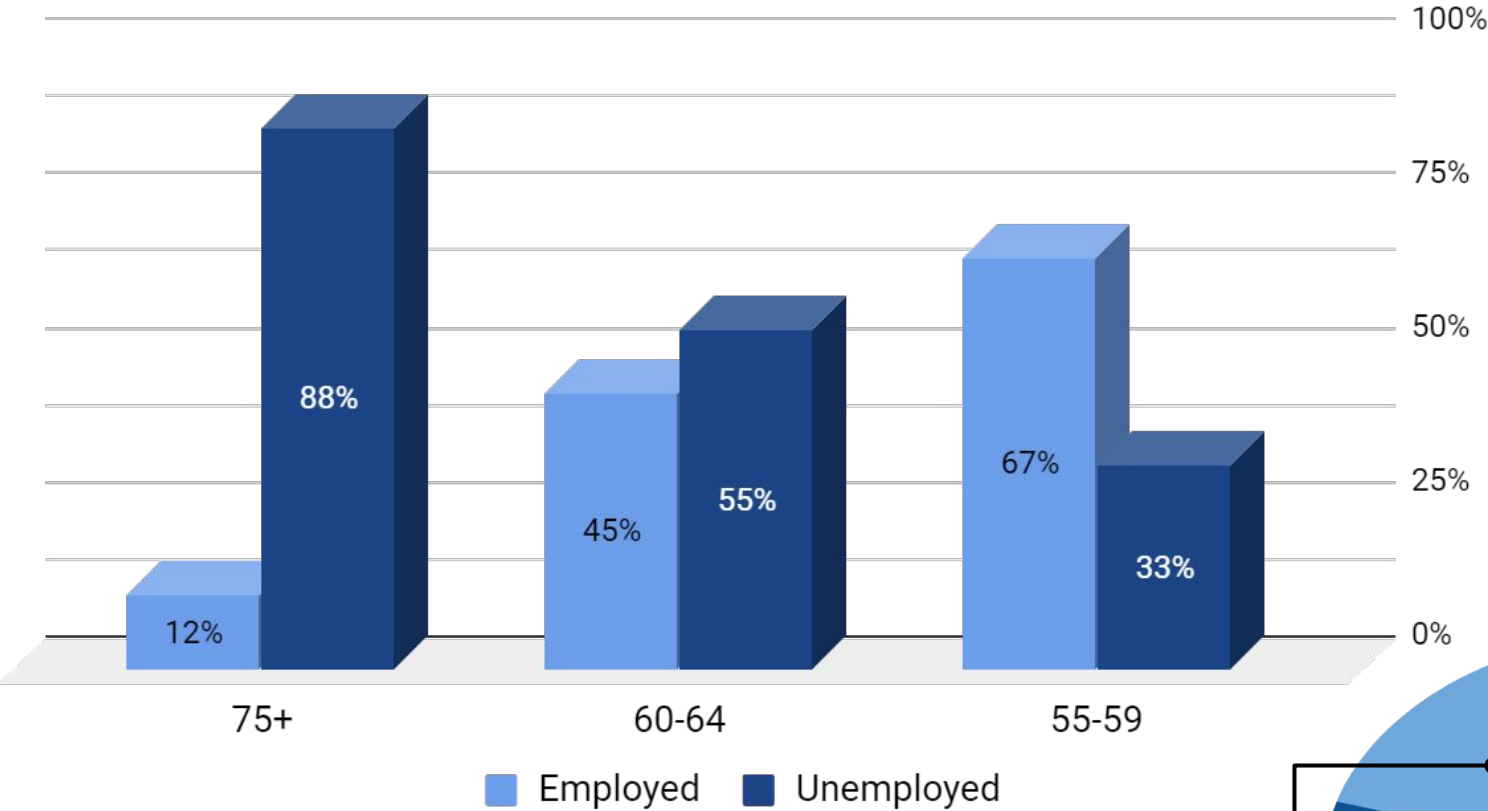
Underrepresented Initiatives				
Non-Medical Initiatives	Geroscience R&D	Longevity Industrial Strategy	AgeTech	Continuing Education



# Hong Kong Age/Employment Range

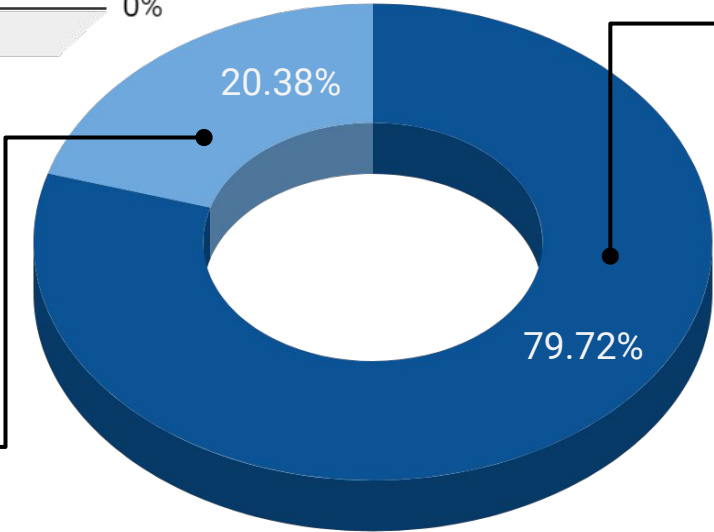


Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





Life Expectancy	Both sexes life expectancy (2019)	85.8 years
	Male life expectancy (2018)	81.1 years
	Female life expectancy (2018)	87.1 years
GDP	GDP per capita, current prices (2018)	41.02 thousand (\$)
	GDP per capita, PPP (2018)	45.56 thousand (\$)
	GDP, current prices (2018)	5 180 billion (\$)
Population Ageing	Rate of population ageing	6.2 (2007-2017)
	Aged over 65 (2018)	28.3%
	Age dependency ratio (2017)	45%
Healthcare Efficiency	Health expenditure (2017)	10.7% of GDP
	Health expenditure per capita (2017)	4.717 thousand (\$)
	Healthcare efficiency score (2018)	64.3
Retirement	Total # retired	34 293 754
	Retired people proportion	27%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	60 years / 60 years

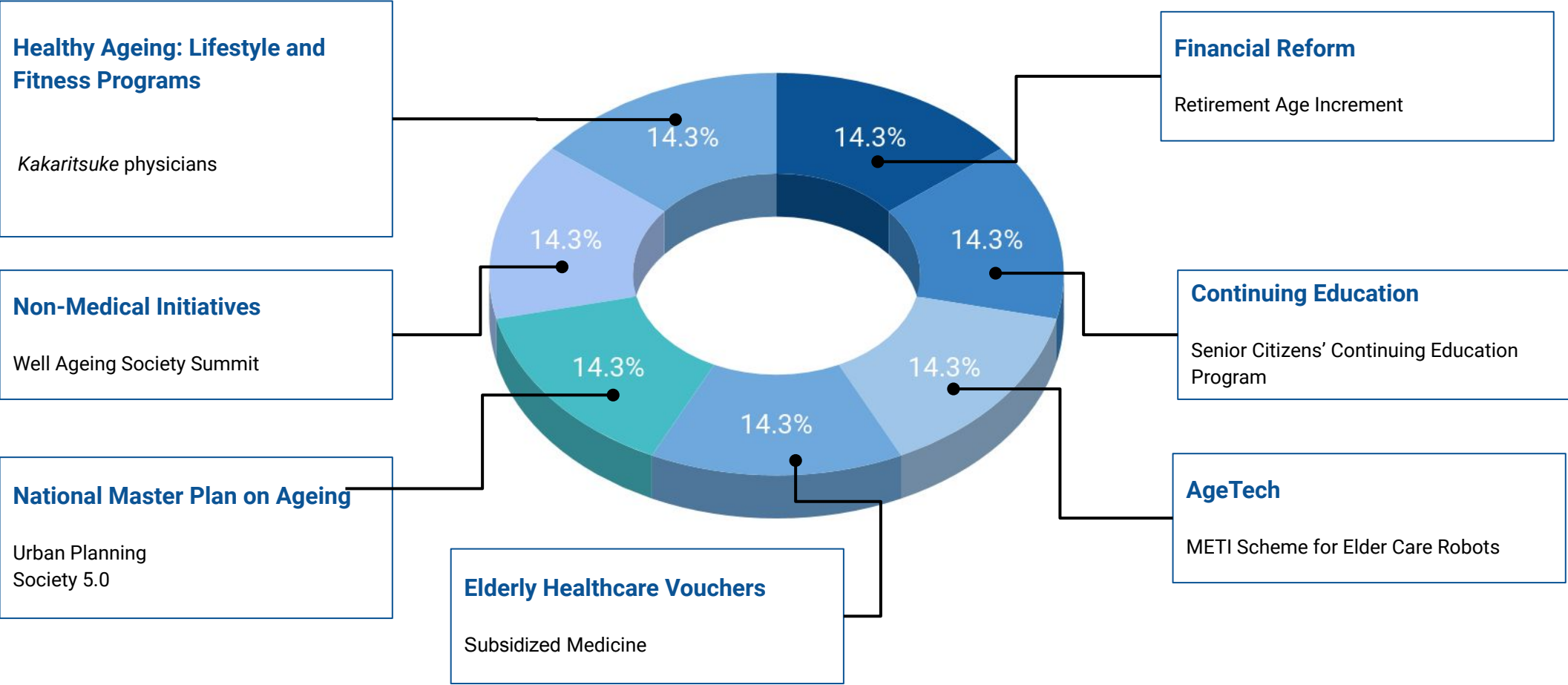
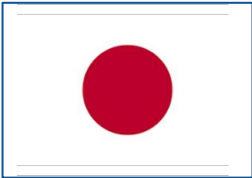
## Longevity Initiatives



- Age of relevant initiatives: **8 years**
- **24** of WHO age-friendly cities and communities
- **6** initiatives focused on non-medical improvement of quality of life



# Japan Initiatives Level of Comprehensiveness

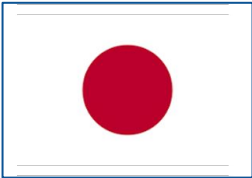


## Underrepresented Initiatives

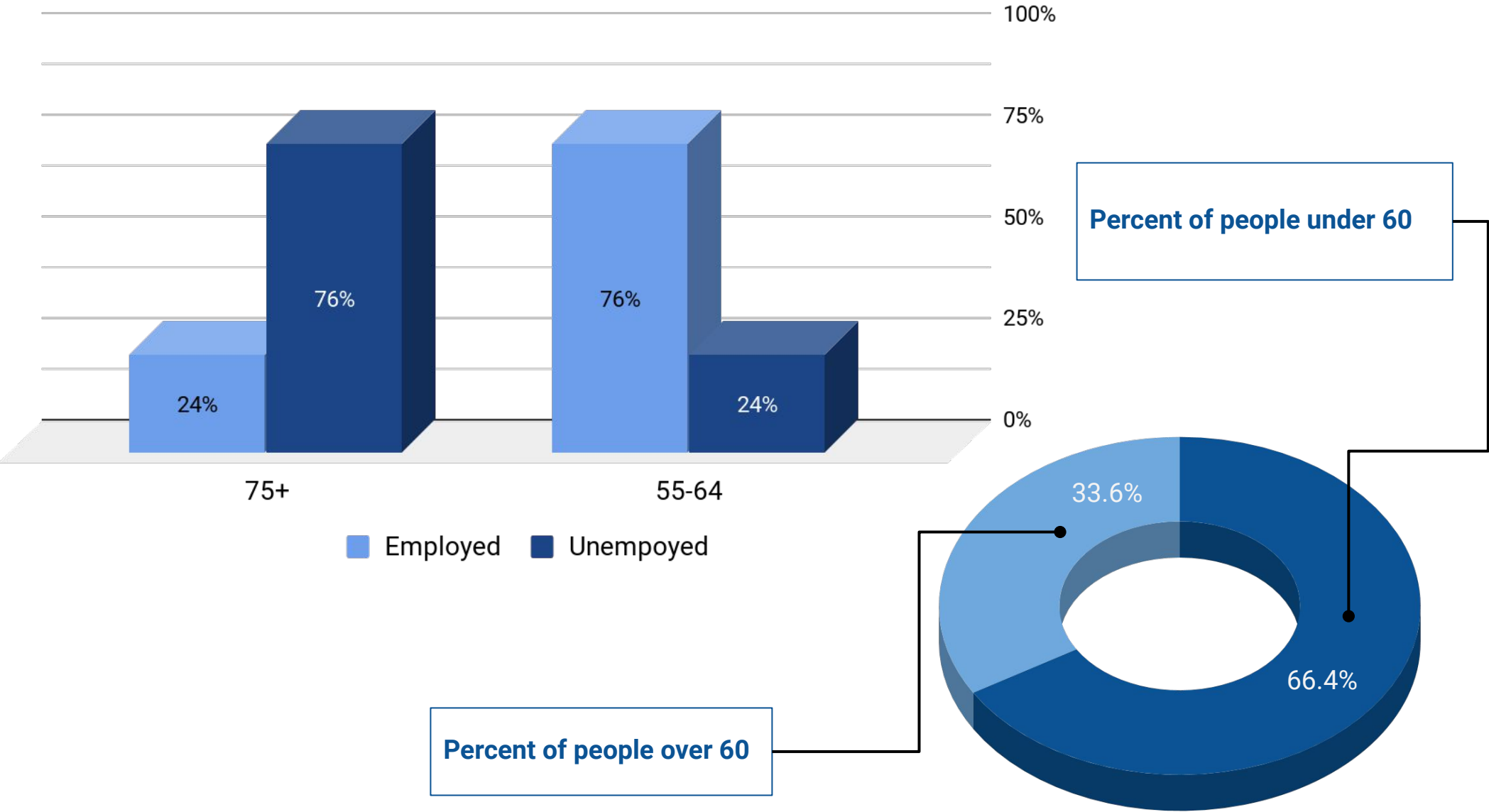
Preventive Medicine	Geroscience R&D	Longevity Industrial Strategy
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# Japan Age/Employment Range



Fraction of the Unemployed by Age





Life Expectancy	Both sexes life expectancy (2019)	79.4 years
	Male life expectancy (2018)	77.0 years
	Female life expectancy (2018)	81.9 years
GDP	GDP per capita, current prices (2018)	64.77 thousand (\$)
	GDP per capita, PPP (2018)	64.77 thousand (\$)
	GDP, current prices (2018)	21 340 billion (\$)
Population Ageing	Rate of population ageing	3 (2007-2017)
	Aged over 65 (2018)	15.6%
	Age dependency ratio (2017)	23%
Healthcare Efficiency	Health expenditure (2017)	17.2% of GDP
	Health expenditure per capita (2017)	10209.4 thousand (\$)
	Healthcare efficiency score (2018)	29.6
Retirement	Total # retired	50 204 174
	Retired people proportion	15%
	Normal retirement age (Man/Woman)	66 years/66 years
	Early retirement age (Man/Woman)	62 years/62 years

## Longevity Initiatives

- Age of relevant initiatives: **55 years**
- **288** of WHO age-friendly cities and communities
- **Master Plans** on states level
- **6** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing

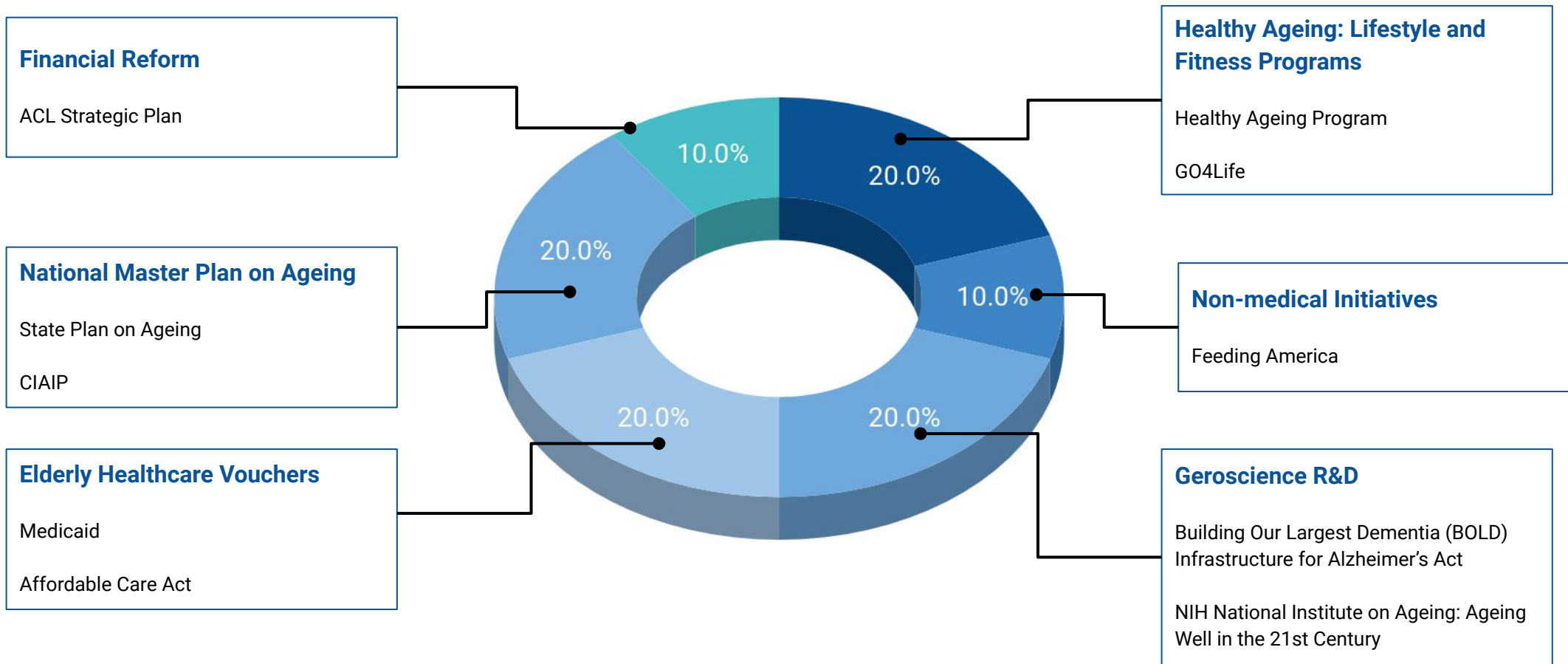




# USA Initiatives Level of Comprehensiveness



120



## Underrepresented Initiatives

Preventive Medicine	AgeTech	Longevity Industrial Strategy	Continuing Education
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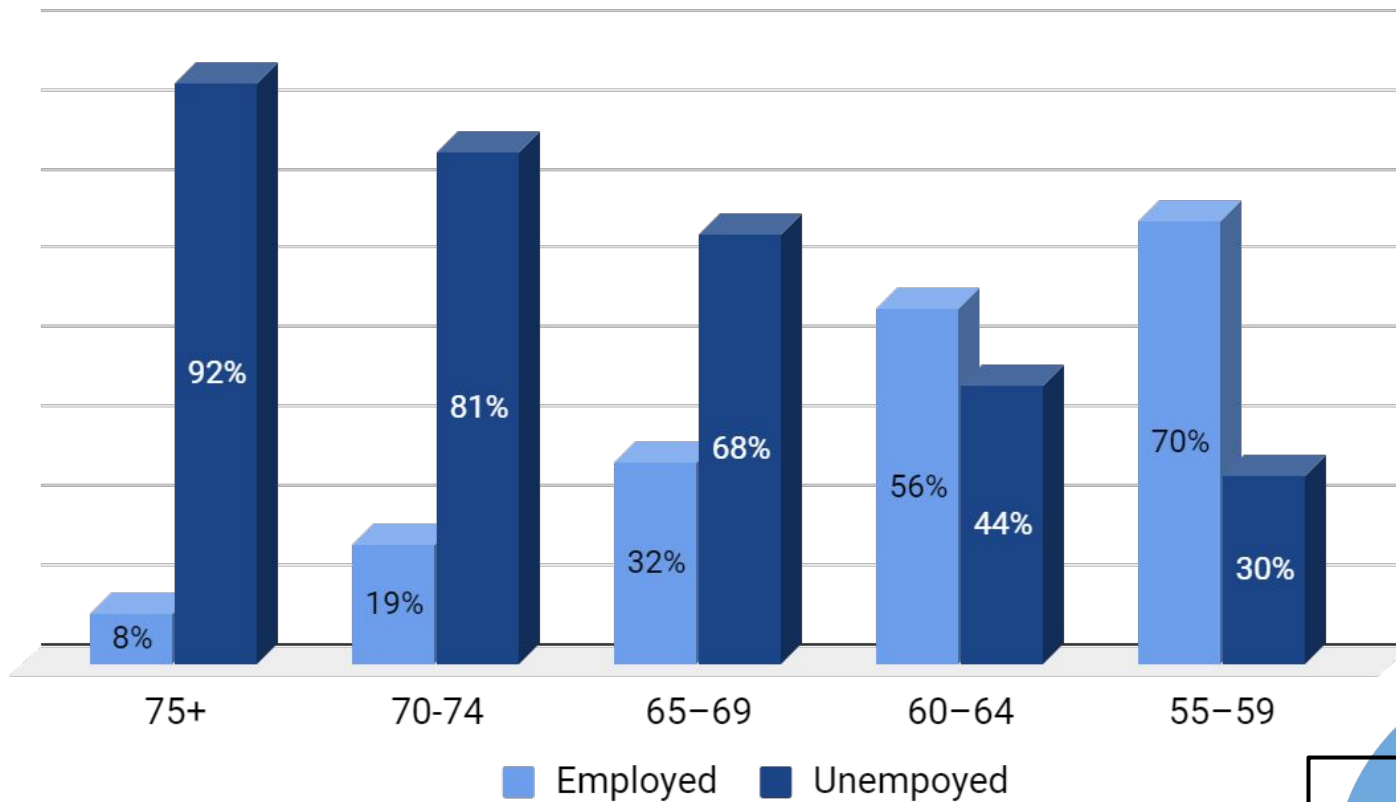


# USA Age/Employment Range



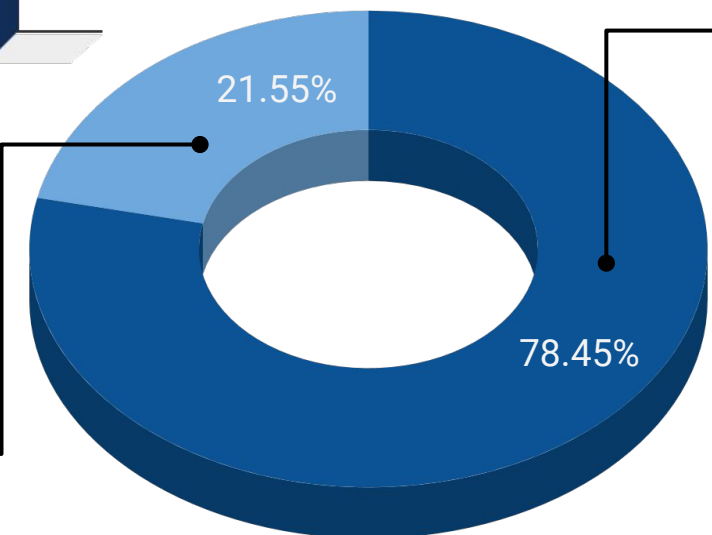
121

## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





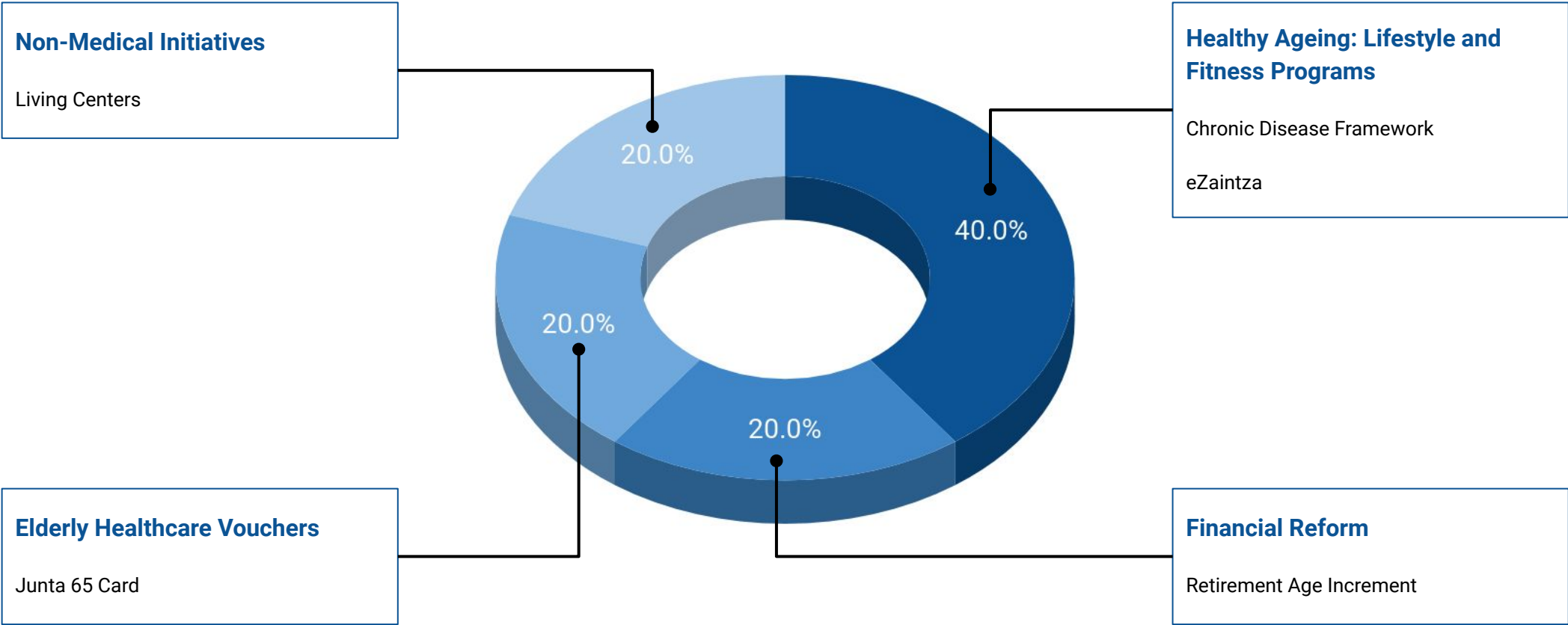
Life Expectancy	Both sexes life expectancy (2019)	81.9 years
	Male life expectancy (2018)	80.3 years
	Female life expectancy (2018)	85.7 years
GDP	GDP per capita, current prices (2018)	30.63 thousand (\$)
	GDP per capita, PPP (2018)	41.54 thousand (\$)
	GDP, current prices (2018)	1 430 billion (\$)
Population Ageing	Rate of population ageing	2.5 (2007-2017)
	Aged over 65 (2018)	18.15%
	Age dependency ratio (2017)	30%
Healthcare Efficiency	Health expenditure (2017)	8.8% of GDP
	Health expenditure per capita (2017)	3.371 thousand (\$)
	Healthcare efficiency score (2018)	69.3
Retirement	Total # retired	9 051 928
	Retired people proportion	19%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	60 years / 60 years

## Longevity Initiatives

- Age of relevant initiatives: **18 years**
- **162** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life



# Spain Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

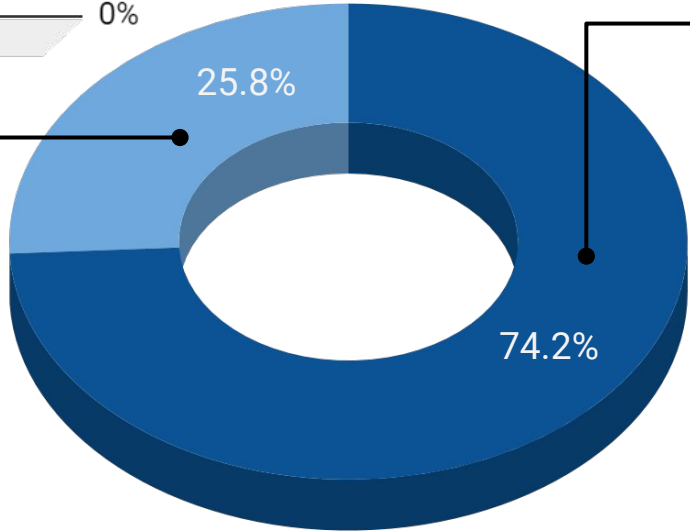
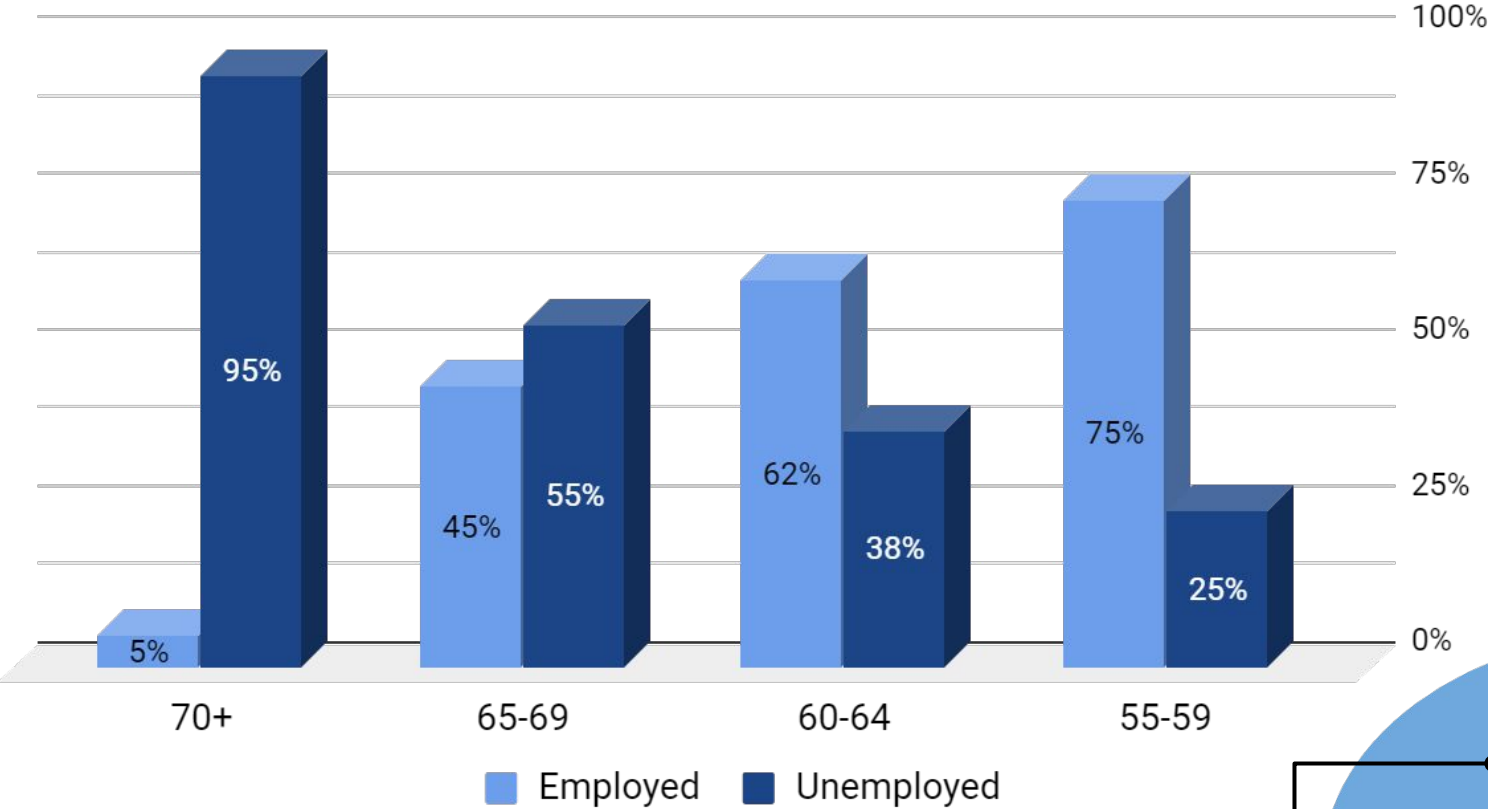
Preventive Medicine	Geroscience R&D	Longevity Industrial Strategy	AgeTech	National Master Plan on Ageing	Continuing Education
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# Spain Age/Employment Range



Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60



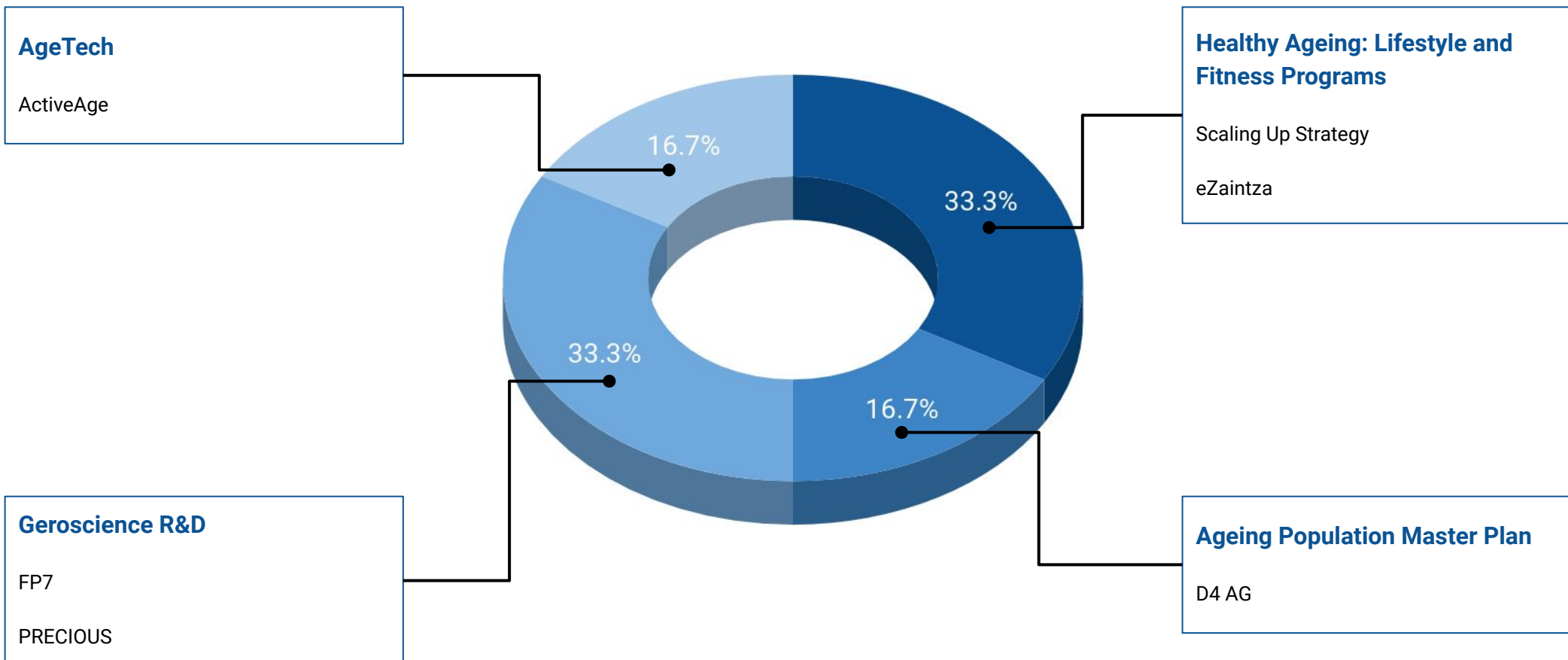
Life Expectancy	Both sexes life expectancy (2019)	78.5 years
	Male life expectancy (2018)	75 years
	Female life expectancy (2018)	82 years
GDP	GDP per capita, current prices (2018)	36.54 thousand (\$)
	GDP per capita, PPP (2018)	44.47 thousand (\$)
	GDP, current prices (2018)	18 710.0 billion (\$)
Population Ageing	Rate of population ageing	2.4 (2007-2017)
	Aged over 65 (2018)	19.0%
	Age dependency ratio (2017)	30%
Healthcare Efficiency	Health expenditure (2017)	7.0% of GDP
	Health expenditure per capita (2017)	3.927 thousand (\$)
Retirement	Total # retired	69 960 901
	Retired people proportion	20%

## Longevity Initiatives



- **319** of WHO age-friendly cities and communities
- **Master Plan on Ageing**
- **4** initiatives focused on non-medical improvement of quality of life
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



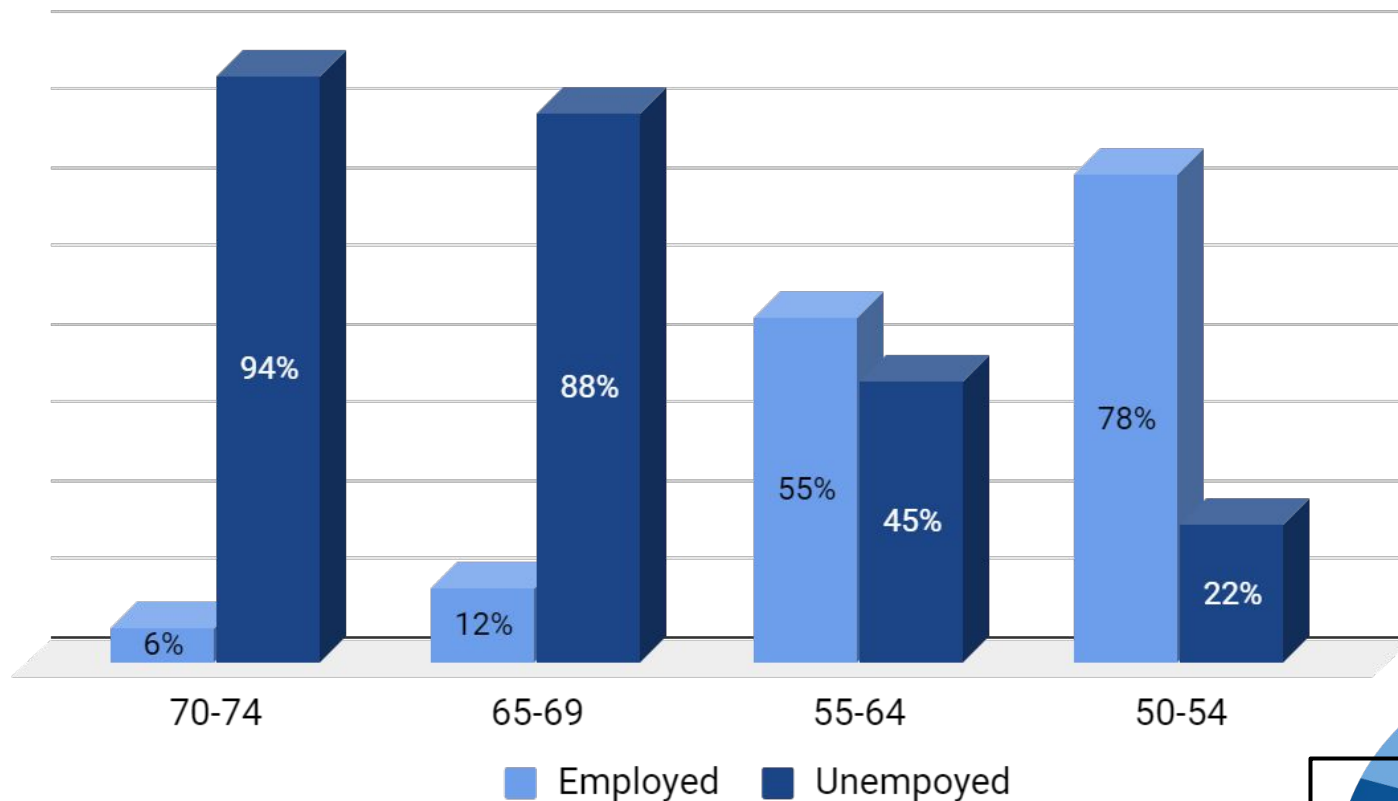


## Underrepresented Initiatives

Preventive Medicine	Healthy Ageing: Lifestyle and Fitness Programs	Longevity Industrial Strategy	Elderly Healthcare Vouchers	Non-Medical Initiatives	Continuing Education
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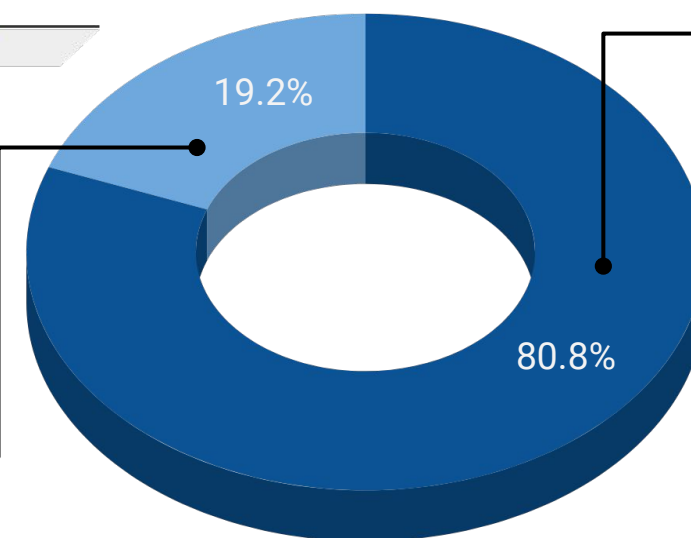


## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





Life Expectancy	Both sexes life expectancy (2019)	75.9 years
	Male life expectancy (2018)	75 years
	Female life expectancy (2018)	77.9 years
GDP	GDP per capita, current prices (2018)	10.15 thousand (\$)
	GDP per capita, PPP (2018)	19.52 thousand (\$)
	GDP, current prices (2018)	14 220 billion (\$)
Population Ageing	Rate of population ageing	3.3 (2007-2017)
	Aged over 65 (2018)	11.9%
	Age dependency ratio (2017)	15%
Healthcare Efficiency	Health expenditure (2017)	1.75% of GDP
	Health expenditure per capita (2017)	1.071 thousand (\$)
	Healthcare efficiency score (2018)	54
Retirement	Total # retired	147 532 179
	Retired people proportion	11%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	60 years / 55 years

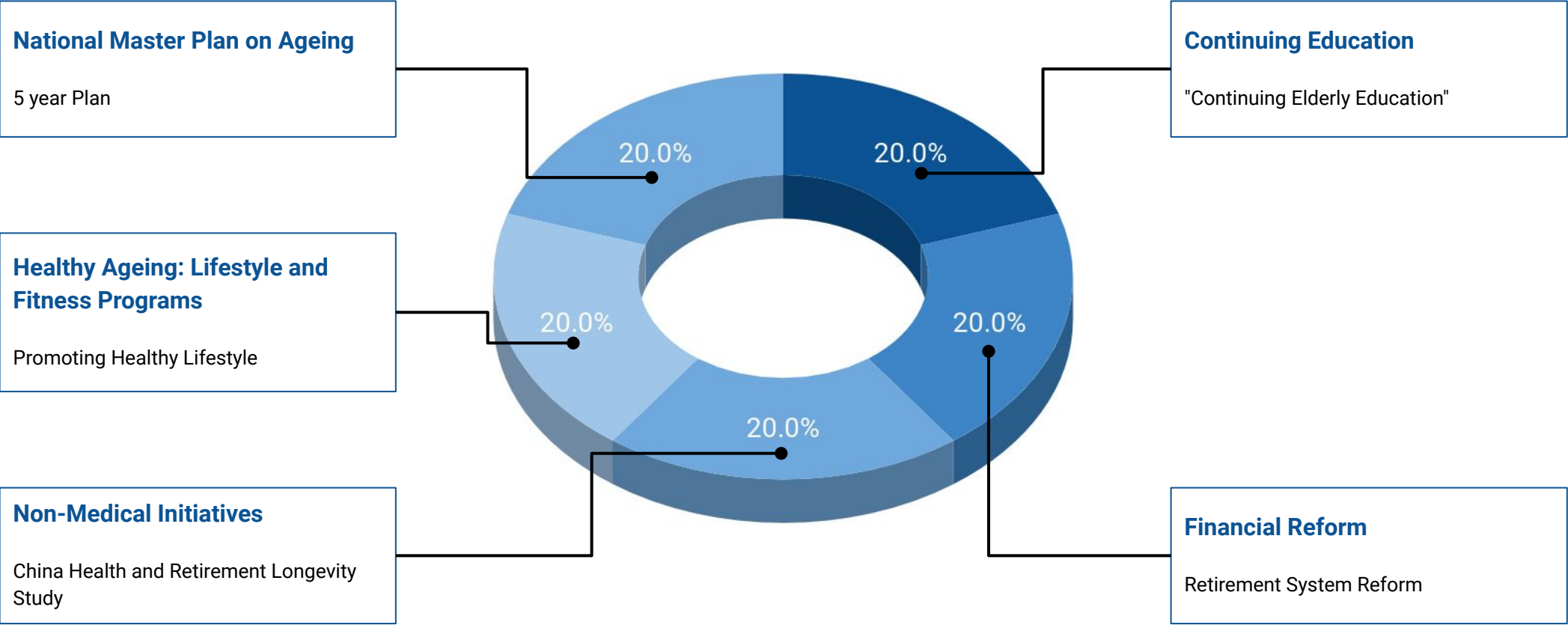
## Longevity Initiatives



- Age of relevant initiatives: **40 years**
- **9** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life



# China Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

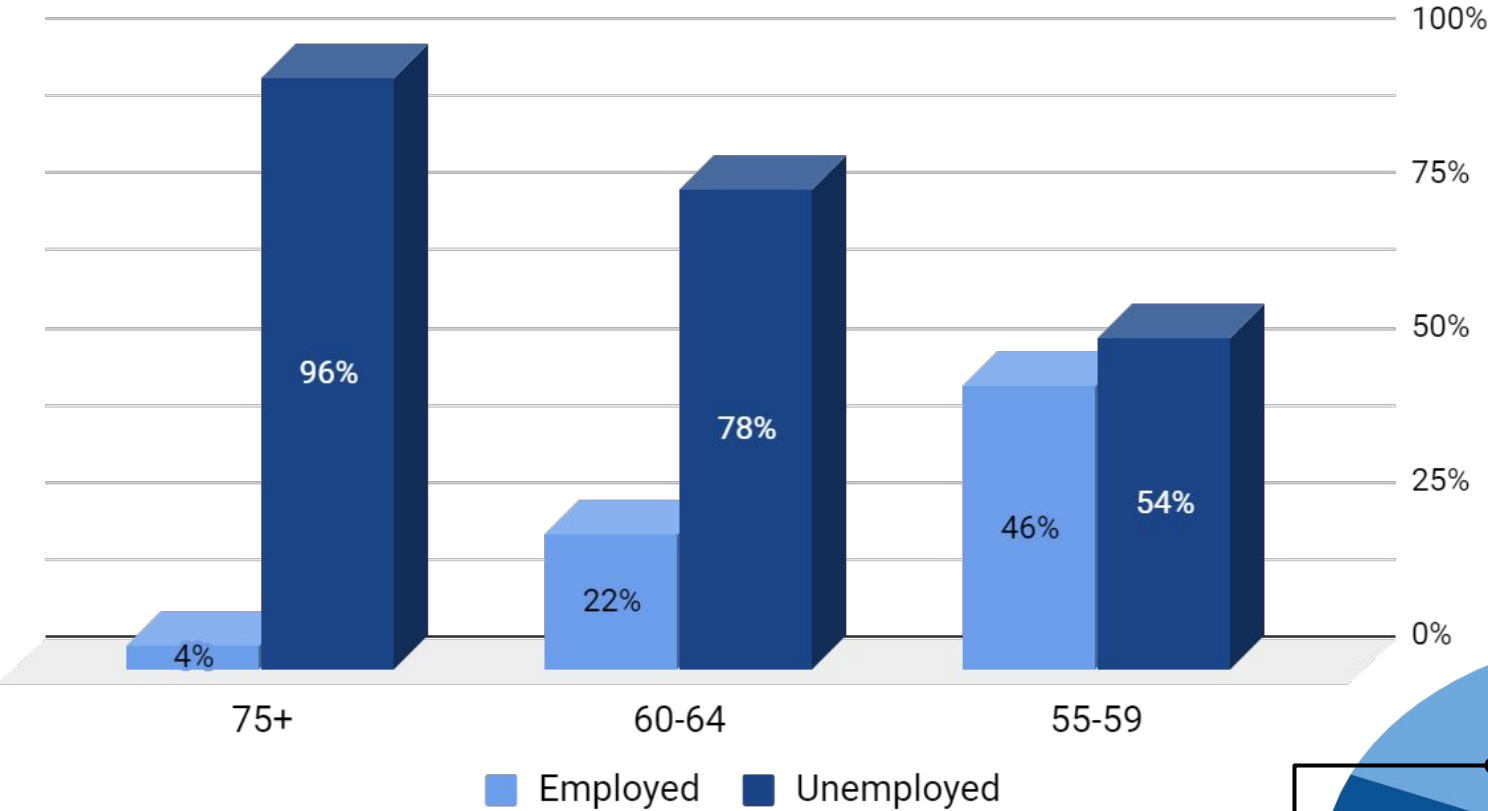
Preventive Medicine	Geroscience R&D	AgeTech	Elderly Healthcare Vouchers	Longevity Industrial Strategy
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# China Age/Employment Range

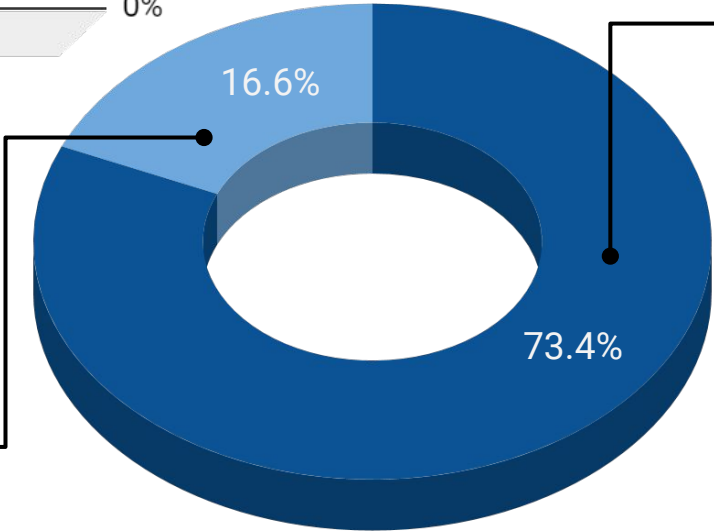


Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





# United Kingdom

*Global Science Hub, Industrial Strategy for  
Ageing Society, Joint Geroscience  
Research Initiative with Israel*





# Summary of Relevant Government Led Longevity Initiatives in the United Kingdom

- The UK is at the forefront of Government-led Longevity Initiatives through the establishment of the £300 Ageing Societies Industrial Grand Challenge.
- But to achieve tangible results, the UK needs more than just an industrial strategy. It needs a Longevity Industry Strategy, and the first step is to combine advanced biomedicine, AgeTech, novel financial systems and progressive social policies in a manner that keeps seniors functioning healthily for longer.
- The UK still needs an explicit commitment to healthspan extension and tackling ageing itself rather than individual diseases.
- The UK still needs to create an ecosystem for cross-sector collaboration between industry, academia and non-profits -- a Longevity industry equivalent of the AI and FinTech industries' "London-Oxford-Cambridge Triangle".
- In short, the UK Government needs to focus on **transforming the deficit model of the 'Ageing Society' to an asset model around 'Longevity'** and be bold with a national strategy to reap the 'Longevity Dividend' for the benefit all people in society.



# History of UK Government Involvement in Longevity

133

March  
2005

## **National Service Framework for Long Term Conditions.**

The NSF focuses on people with long-term neurological conditions, much of the guidance it offers can apply to anyone living with a long-term condition. It is designed to be a key tool for delivering the government's strategy to support people with long term conditions outlined in the NHS Improvement Plan: Putting People at the Heart of Public Service.

## **The Partnerships for Older People Project (POPPs) programme.**

The POPPS programme was launched in March 2005 by the Department of Health. The aim of the programme is to deliver and evaluate (through 29 Local Authority led pilots), locally innovative approaches aimed at creating a sustainable shift in resources and culture away from institutional and hospital-based crisis care for older people towards earlier, targeted interventions.

October  
2007

## **Tackle Poverty and Promote Greater Independence and Well-being in Later Life.**

Public Service Agreement (PSA) 17 issued by the Department for Work on Pensions in October 2007 seeks to ensure that the specific needs of the older population are given due priority. It sets out the outcomes the government seeks to achieve in the Comprehensive Spending Review period to promote improvements in independence and well-being in later life for the longer term.

3 March  
2008

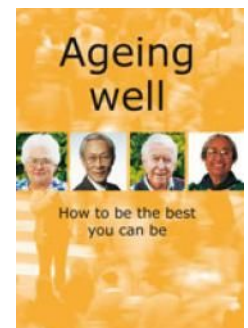
## **Independent Living Strategy.**

The Independent Living Strategy was launched by the Office for Disability Issues. The five-year strategy joins current and new policy initiatives to provide a coherent framework for making progress towards independent living for disabled people, including older disabled people. The strategy aims to give disabled people more choice and control over the support they need and greater access to employment, transport, health and housing opportunities. The strategy makes a series of new commitments involving six government departments.

12 July  
2010

## **Ageing Well Programme Launched by DWP.**

Ageing Well is a new programme designed to support local authorities to improve their services for older people. The key aim of the programme is to provide a better quality of life for older people through local services that are designed to meet their needs and recognise the huge contribution that people in later life make to their local communities. It is a sector led programme which consolidates current best practice from local authorities, the findings of wider research and the lessons learned from earlier pilot activities. This combined body of evidence shows that strong leadership, working in partnership, joining up services and including older people in service design and delivery, leads to more cost effective services with better outcomes for older people.



# History of UK Government Involvement in Longevity

134

12 March  
2018

## **Industrial Strategy Challenge Fund Allocated.**

Innovate UK, the UK's technology strategy board (which reports directly to BEIS), allocate £300 million from their Industrial Strategy Challenge Fund, to develop methods to help the global ageing population, with opportunities for businesses and researchers to work together.



1 June  
2018

## **BIRAX Ageing Created.**

The British Council, the Pears Foundation and the British Embassy in Israel announce The Britain Israel Research and Academic Exchange Partnership (BIRAX), a multi-million pound initiative to advance innovative scientific research in ageing, big data and personalised medicine.



6 Sep  
2018

## **NHS Healthcare Data Debate.**

House of Lords sits to debate how NHS healthcare data could be used to improve the health of the nation.

10 Sep  
2018

## **Digitalisation of Medicines Manufacturing Challenge Fund Opened.**

Innovate UK, begin awarding the Digitalisation of Medicines Manufacturing Challenge Fund, an investment of up to £8 million in capital infrastructure, to projects which "enable existing medicines manufacturing operations to improve their scope, efficiency and effectiveness through the application of digitally-enabled technology".



1 Oct  
2018

## **Genomic Medicine Service in England Launched.**

Hospitals across England will be connected to specialist centres that read, analyse and interpret patient DNA to help diagnose rare diseases, match patients to the most effective treatments, and reduce adverse drug reactions.



March  
2019

## **All-Party Parliamentary Group for Longevity.**

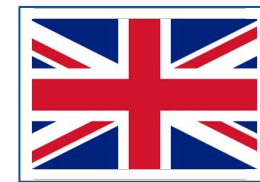
Cross-disciplinary exchange on benefits of longevity (as opposed to 'problems' of ageing) within an ethical, citizen-centred framework to maximise the societal benefits of enabling healthier, more productive and purposeful lives. AI and data-driven solutions to increase healthspan and democratise access to the 'longevity dividend' for citizens will be a focus.

19 Mar  
2019

## **Healthy Ageing Grand Challenge Conference.**

While not officially affiliated with the UK Government, this conference focuses on the UK's 2nd Industrial Strategy Grand Challenge, Ageing Population. Topics to be discussed include the current health needs of the UK's older population and how demand is set to increase in the future, how to promote better health in later life and manage long-term conditions.





Life Expectancy	Both sexes life expectancy (2019)	81 years
	Male life expectancy (2018)	79.7 years
	Female life expectancy (2018)	83.2 years
GDP	GDP per capita, current prices (2018)	42.31 thousand (\$)
	GDP per capita, PPP (2018)	46.78 thousand (\$)
	GDP, current prices (2018)	2,830 billion (\$)
Population Ageing	Rate of population ageing	2.2 (2007-2017)
	Aged over 65 (2018)	18.5%
	Age dependency ratio (2017)	29%
Healthcare Efficiency	Health expenditure (2017)	9,6% of GDP
	Health expenditure per capita (2017)	4.246 thousand (\$)
	Healthcare efficiency score (2018)	58.9
Retirement	Total # retired	12,225,489
	Retired people proportion	19%
	Retirement age (Early/Normal)	65 years/68 years

## Longevity Initiatives

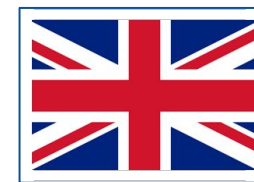


- Age of relevant initiatives: **14 years**
- **23** of WHO age-friendly cities and communities
- £300 million **National Longevity Industrial Strategy**
- **8** initiatives focused on non-medical improvement of quality of life
- **3** initiatives focused on preventive medicine and healthcare approaches
- **1** initiative involves research or R&D of medicines that directly impact on ageing

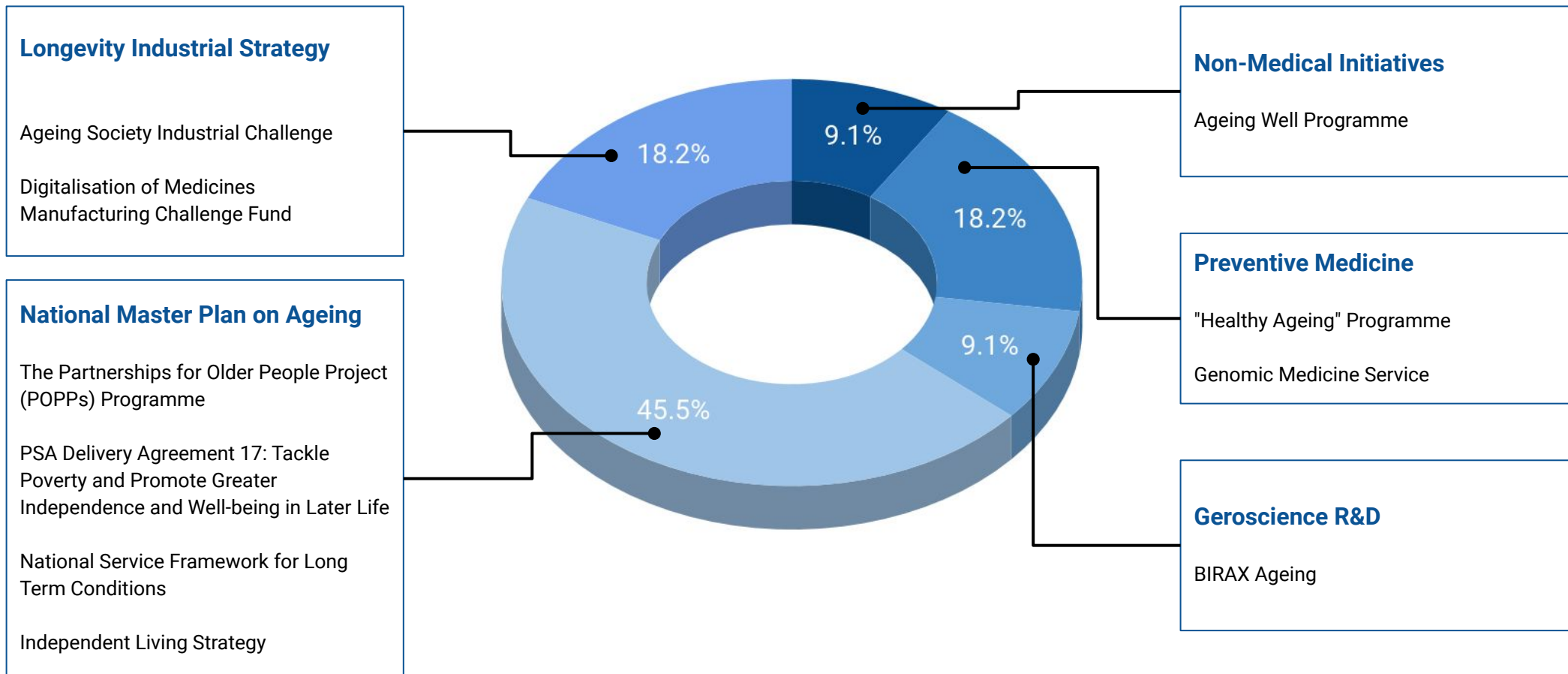


# United Kingdom Initiatives

## Level of Comprehensiveness



136



### Underrepresented Initiatives

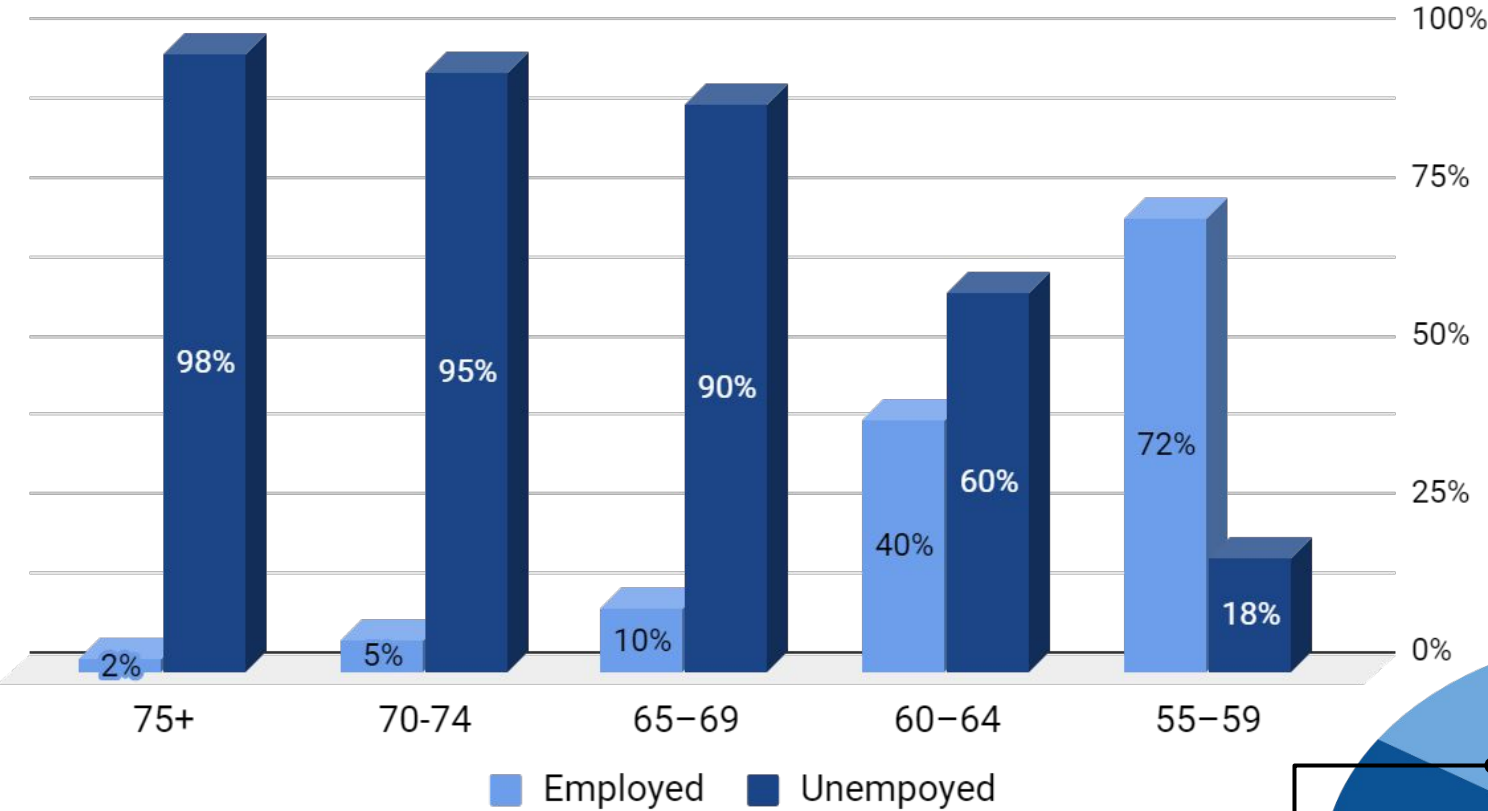
Healthy Ageing: Lifestyle and Fitness Programs	AgeTech	Elderly Healthcare Vouchers	Financial Reform	Continuing Education
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# United Kingdom Age/Employment Range

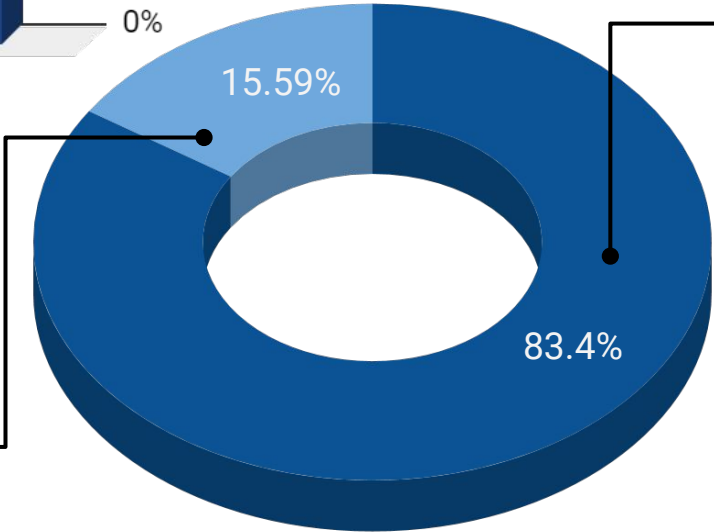


Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60







In *Longevity Landscape Vol II: The Business of Longevity* we predicted the emergence of an **AgeTech sector** (consisting of non-biomedical technologies that can assist elderly people maintain quality of life), and the emergence of the corresponding financial sphere as a key aspect of the Longevity Industry.

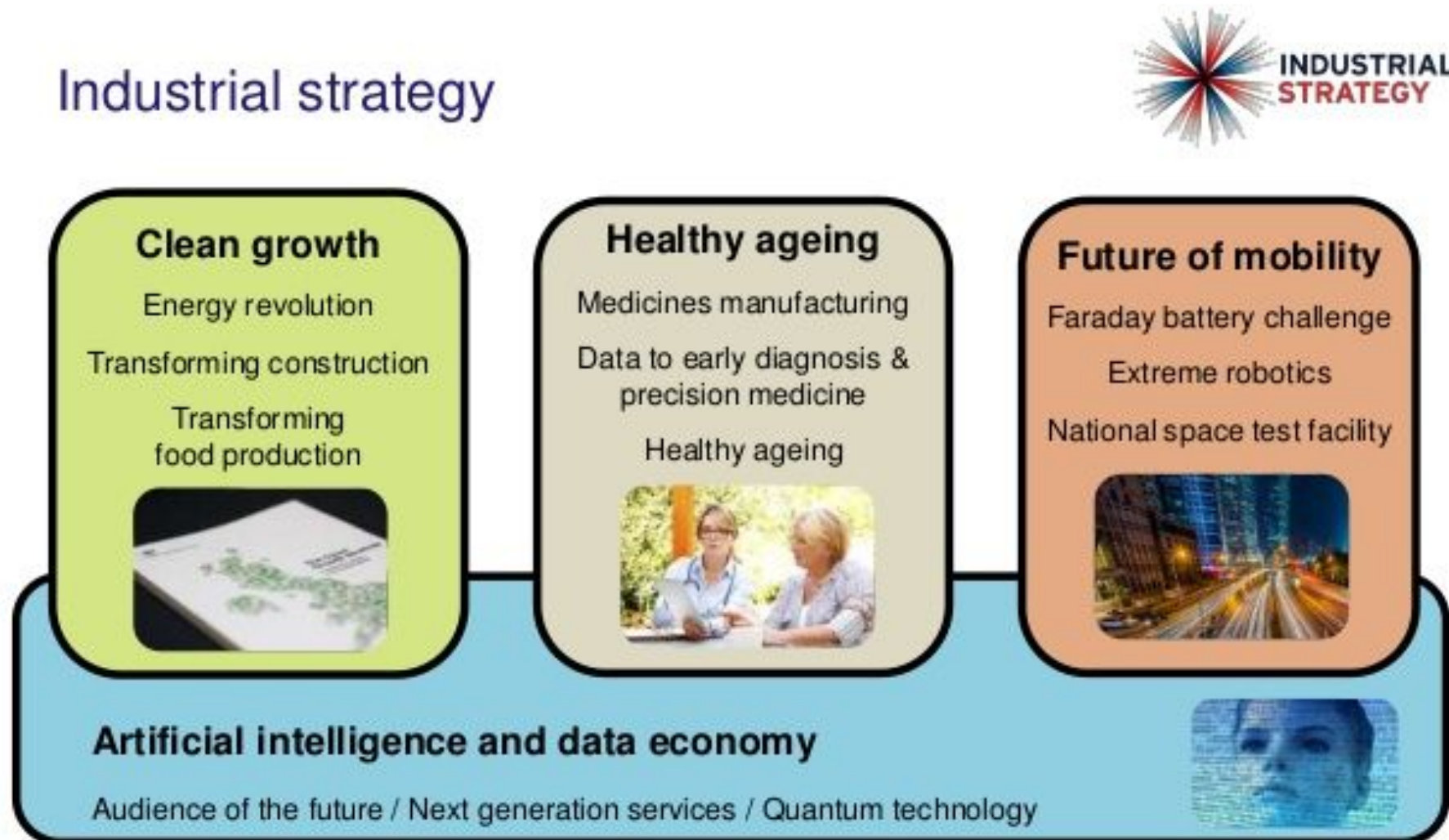
The BEIS policy paper released in May 2018 appears to be laying the groundwork for this sector.

*“Ageing populations will create new demands for technologies, products and services, including new care technologies, new housing models and innovative savings products for retirement.”*

~ May 2018 policy paper, Department for Business Energy and Industrial Strategy

There is now a move toward AgeTech in the world of startup: In February 2018, London’s *Innovation Warehouse*, originally founded in 2010 as a community for digital start-ups, established an AgeTech & Longevity Hub, providing mentoring and corporate finance services to early-stage FinTech enterprises, with the stated aim of *“extending healthier lifespans and maintain quality of life for our growing, ageing population.”*

As presented below, **AI and biomedicine intersect at the centre of the UK's Industrial Strategy**. The Industrial Strategy appears to be designed with synergies in mind, including the synergy between digital and biotech industries which, as we have argued in previous reports, will come to drive the future growth of the emerging Longevity Industry. The following slides summarise developments in 2018 which show some of these synergies in their early stages.





## £300 million Ageing Society Grand Challenge fund

In March 2018 the government announced **£300 million** for their **ageing society grand challenge**. This investment will be subdivided into three programs:

**The £98 million “healthy ageing programme” (£98 million) aims to drive the development of new products and services which will help people to live in their homes for longer, tackle loneliness, and increase independence and wellbeing.**

**Data to early diagnosis and precision medicine programme (£210 million)** will develop innovative new diagnostic tools, medical products and treatments. Part of this will be an investment in **genomics and large scale whole genome sequencing** to help those with rare diseases receive faster diagnoses and cancer patients gain better access to personalised treatment programmes.

The UK will sequence the genomes of 500,000 Biobank volunteers. The data from each of these volunteers will provide a rich resource of data that UK researchers will use to build a greater understanding of disease processes and enable the development of tools for early diagnosis and a new wave of therapies.

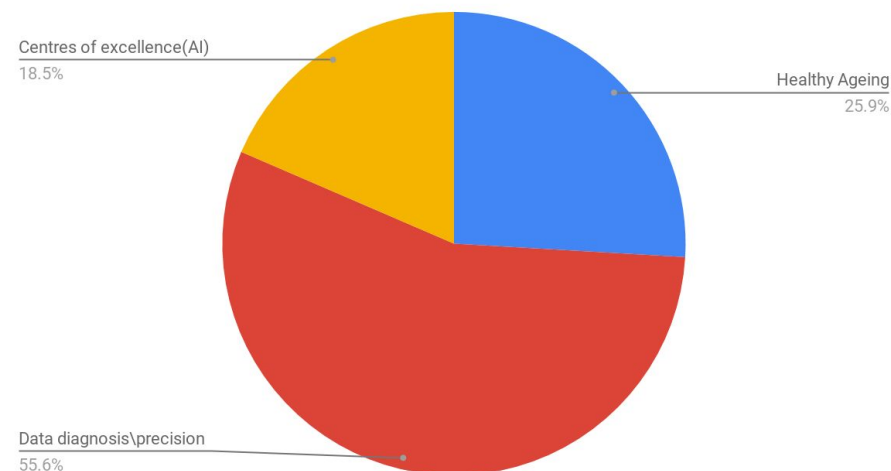
**Regional centres of excellence program (£70 million)** will create regional centres across the UK to offer UK patients better diagnosis using new technologies including **Artificial Intelligence (AI)** to analyse medical images. This has the potential to diagnose disease more accurately and therefore provide more targeted treatment, and increase efficiency in the health system.



**INDUSTRIAL  
STRATEGY**

UK Research  
and Innovation

Ageing Society Industrial Challenge fund



One early beneficiary of the “**Healthy Ageing Programme**” is NquiringMinds, a British company that specialises in the field of artificial intelligence and the ‘Internet of Things’.

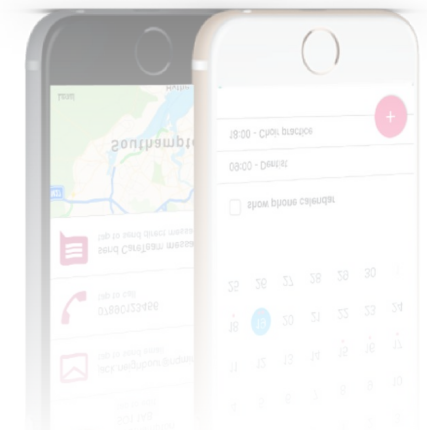
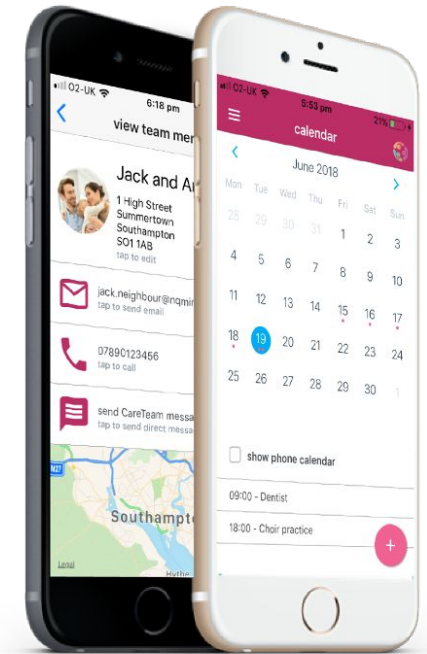
In partnership with the University of Southampton, Southampton City Council and Hampshire County Council, NquiringMinds has developed a technical platform called CareTeam that is all about making aged care more collaborative. At the centre of the CareTeam platform is an app that integrates the help from friends, family and neighbours along with the professional carers. The app allows an invited circle of trusted people to share important information such as medications and appointments in a secure platform.

## The CareTeam approach seeks to transform the social care sector in the following ways:

**Sensor analytics:** Using AI algorithms and simple sensors, such as energy monitors and infra-red movement sensors, the CareTeam system spots anomalies in a person’s behaviour and alerts their carers if there is a significant change, e.g. if they haven’t made their cup of tea at the usual time.

**Self-learning workflow:** The CareTeam system also uses analytics to gather insight on patterns in care and behaviour, which can then be used to plan future care needs. Through these insights and analytics, the platform helps to continuously monitor and improve the quality of care.

**Social care insights:** All local councils are continually generating and storing data on the cost and quality of social care provided. With the help of AI algorithms that can analyse trends, detect anomalies and predict patterns, this data can be used to better plan the provision of social care.







On 6 November 2018 the business secretary Greg Clark announced five new centres of excellence for digital pathology and imaging, including radiology using artificial intelligence medical advances.

The centres will be used to help hospitals make scans and biopsy images digital in a bid to cut down manual reporting to free up more staff time for direct patient care in the NHS and is part of a bid to find new ways to speed up diagnosis of diseases to improve to outcomes for patients. They will aim to offer more personalised treatment for patients while freeing up doctors to spend more time caring for patients, while investment in large-scale genomics and image analysis will drive new understanding of how complex diseases develop.

The centres, funded by the Industrial Strategy Challenge Fund which is managed by UK Research and Innovation (UKRI), will be based at universities and NHS facilities and are expected to be up and running in 2019.

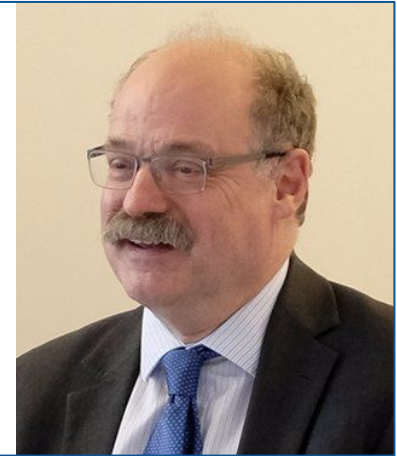
## The centres are:

- London Medical Imaging and Artificial Intelligence Centre for Value-Based Healthcare will use artificial intelligence in medical imaging and related clinical data for faster and earlier diagnosis and automating expensive and time-consuming manual reporting.
- Glasgow’s I-CAIRD (Industrial Centre for AI Research in Digital Diagnostics) will bring together clinicians, health planners, and industry to work with innovative SMEs to answer clinical questions, and solve healthcare challenges more quickly and efficiently.
- NCIMI (National Consortium of Intelligent Medical Imaging) in Oxford will consider the role clinical imaging plays in the delivery of more personalised care and earlier diagnosis to support disease prevention and treatment.
- The Northern Pathology Imaging Collaborative (NPIC) located in Leeds will boost the city’s reputation in digital pathology research further by creating a world-leading centre linking up nine industry partners, eight universities and nine NHS trusts.
- The Pathology image data Lake for Analytics, Knowledge and Education (PathLAKE), based in Coventry, will use NHS pathology data to drive economic growth in health-related AI.



## Professor Sir Mark Walport, Chief Executive of UKRI

*“Early diagnosis of illness can greatly increase the chances of successful treatment and save lives. The centres announced today bring together the teams that will develop artificial intelligence tools that can analyse medical images varying from x-rays to microscopic sections from tissue biopsies. Artificial intelligence has the potential to revolutionise the speed and accuracy of medical diagnosis. The centres will bring together doctors, businesses and academics to develop products using these advances in digital technology to improve early diagnosis of disease, including cancer by detecting abnormalities.”*



## Matt Hancock, Health Secretary

*“Artificial intelligence will play a crucial role in the future of the NHS – and we need to embrace it by introducing systems which can speed up diagnoses, improve patient outcomes, make every pound go further and give clinicians more time with their patients. As part of our long-term plan, we will transform the NHS into an ecosystem of enterprise and innovation that allows technology to flourish and evolve.”*



## Greg Clark, Business Secretary

*“AI has the potential to revolutionise healthcare and improve lives for the better. That’s why our modern Industrial Strategy puts pioneering technologies at the heart of our plans to build a Britain fit for the future. The innovation at these new centres will help diagnose disease earlier to give people more options when it comes to their treatment, and make reporting more efficient, freeing up time for our much-admired NHS staff time to spend on direct patient care.”*





On 10 September a competition opened for UK businesses to apply for the Digitalisation of Medicines Manufacturing: Challenge Fund, a share of up to £8 million from the government's Industrial Strategy Challenge Fund for projects that significantly improve the efficiency, effectiveness and scope of medicines manufacture., by reducing waste and costs in the medicines supply chain through greater use of digitalisation.

It is provided by UK Research and Innovation and delivered through Innovate UK.

They are considering projects that address at least 1 of 3 themes. In order to be eligible they must aim to:

- Improve the UK's capacity and capability to manufacture small-molecule, biological, or cell or gene-based medicines.
- Significantly reduce the cost of manufacturing these medicines.
- Significantly reduce the waste produced while manufacturing them.

Projects' total costs must be between £2 million and £4 million. Projects themselves must start by 1 January 2019 and end by 31 March 2019. They can last between 3 and 4 months.

## Innovate UK

Notice

# Digitalisation of medicines manufacturing: Challenge Fund

Published 20 August 2018

The Industrial Strategy sets out Grand Challenges to put the UK at the forefront of the industries of the future, ensuring that the UK takes advantage of major global changes, improving people's lives and the country's productivity. The first 4 Grand Challenges are focused on the global trends which will transform our future:

- Growing the Artificial Intelligence and data driven economy
- Clean growth
- Future of mobility
- **Ageing society**



**Ageing society:** The UK population is ageing, as it is across the industrialised world. The prospect of longer lives will require people to plan their careers and retirement differently. Ageing populations will create new demands for technologies, products and services, including new care technologies, new housing models and innovative savings products for retirement. The state has an obligation to help older citizens lead independent, fulfilled lives, continuing to contribute to society, must be created an economy which works for everyone, regardless of age.

In support of the Grand Challenge on data and artificial intelligence (AI), a new Centre for Data Ethics and Innovation is being established to enable and ensure safe, ethical and ground-breaking innovation in AI and data-driven technologies. The centre will work with government, regulators and industry, as well as across sectors and applications, to ensure that the UK's regulatory regime fully supports – and removes barriers to – the ethical and innovative use of data and AI. This will lay the foundations for AI adoption which could benefit households across the UK by up to £2,300 per year by 2030, and ensure that the positive impact of these technologies on the UK economy and society can be maximised.



# Ministers Announce £300 Million Research Fund To Help Brits Reach 100

Ministers will inject more than £300 million into researching old age in order to support the ageing population. They say *“we need to ‘revolutionise’ the way people get older – ensuring they remain healthy and independent for longer.”*

The funding will support a research hub looking at dementia as well as a major project looking at the prevention and treatment of disease, involving more than 500,000 patients. Under the plans set out by Mr Greg Clark, a £210 million competitive fund will be established to invest in the development of innovative diagnostic tools, medical products and treatments.



It will include the creation of a series of regional centres across the UK to improve the diagnosis of patients using technologies such as artificial intelligence. A further £98 million will be invested in a healthy ageing programme to develop products and services to help people to live in their homes for longer. In addition, £40 million will go to the UK Dementia Research Institute, in partnership with University College London, to create a hub in which 350 leading scientists will research treatments for the condition.

An estimated 850,000 people in UK are living with the disease.

Care minister Caroline Dinenage added: *“As a society we are living longer – a child born today can expect to live to 100 years – but now we must seize the opportunity to improve the quality of lives lived longer.”*

The state pension age for men and women will rise to 66 by 2020, and Government actuaries believe it will reach 70 in the 2050s and 71 in the 2060s.





# The Netherlands

*Tradition of Spending on Prevention and  
Commercialization of Public Research*

- Has dedicated minister for the elderly.
- Is the home of 'dementia villages' - communities built with the needs of dementia sufferers in mind.
- National Care for the Elderly Programme to improve care and support for frail elderly persons. This four year programme (2008–2011) is initiated by the Ministry of Health, Welfare and Sport. The budget is 80 million euro.
- Recent sharp increase in pension age (67) and another one planned in 2021. This planned incremental change suggests a degree of long-termism.
- Groningen Active Ageing Strategy is an intervention programme to enhance the health literacy, lifestyle, and resilience of community-dwelling, sedentary, frail older adults in deprived areas.
- The cooperative Deltaplan for Dementia is the Dutch national platform to address and manage the growing problem of dementia. It includes provisions for non-geroscience research.



**1993** **Dementia village scheme begins with Hogeweyk model village**  
Hogweyk, which will eventually become a model village uniquely configured to the needs of Alzheimers sufferers, begins life as a nursing home.

**2008** **Dutch National Care for the Elderly Programme**  
The Netherlands Organisation of Health Research and Development (ZonMw) launches the ambitious National Care for the Elderly Programme to improve care and support for frail elderly persons. This four year programme (2008–2011) is initiated by the Ministry of Health, Welfare and Sport. The budget is 80 million euro.

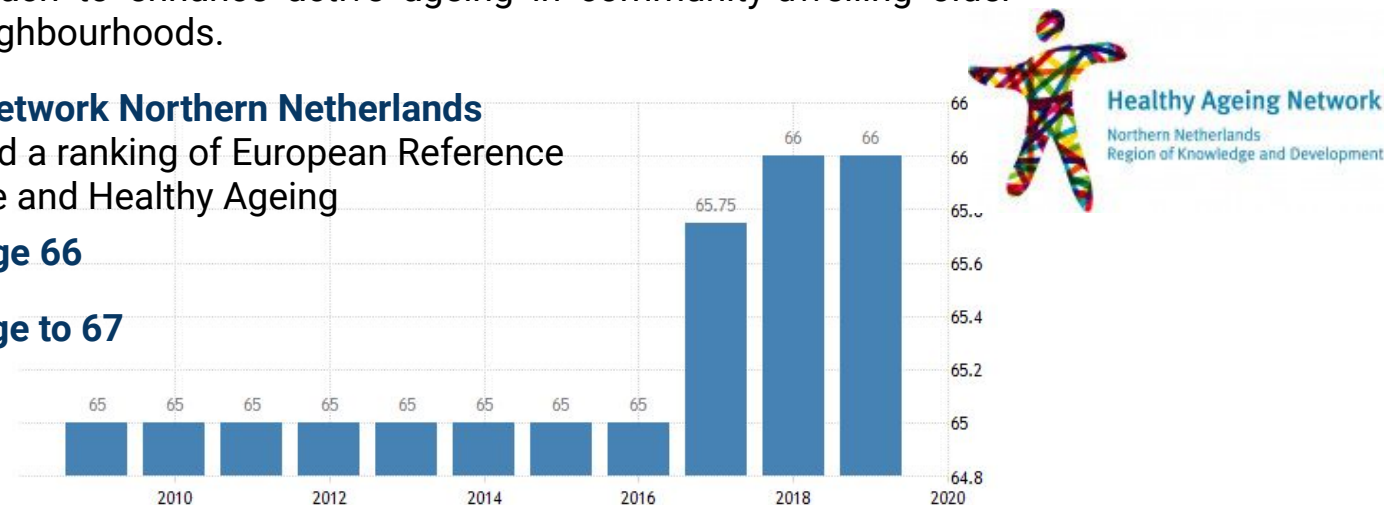
**2013** **Deltaplan for Dementia**  
The Netherlands Dementia Delta Plan was launched by the Minister for Health Welfare and Sport. It will invest 32.5 million euros over the subsequent four years for scientific research into dementia.

**April 2016** **Groningen Active Ageing Strategy launched**  
A sustainable Dutch approach to enhance active ageing in community-dwelling older people living in deprived neighbourhoods.

**July 2016** **HANNN - Healthy Ageing Network Northern Netherlands**  
North Netherlands presented a ranking of European Reference Regions in the field of Active and Healthy Ageing

**2018** **2018 Increase in pension age 66**

**2021** **2021 increase in pension age to 67**



Dutch retirement age, women

SOURCE: TRADINGECONOMICS.COM | TAX AND CUSTOMS ADMINISTRATION





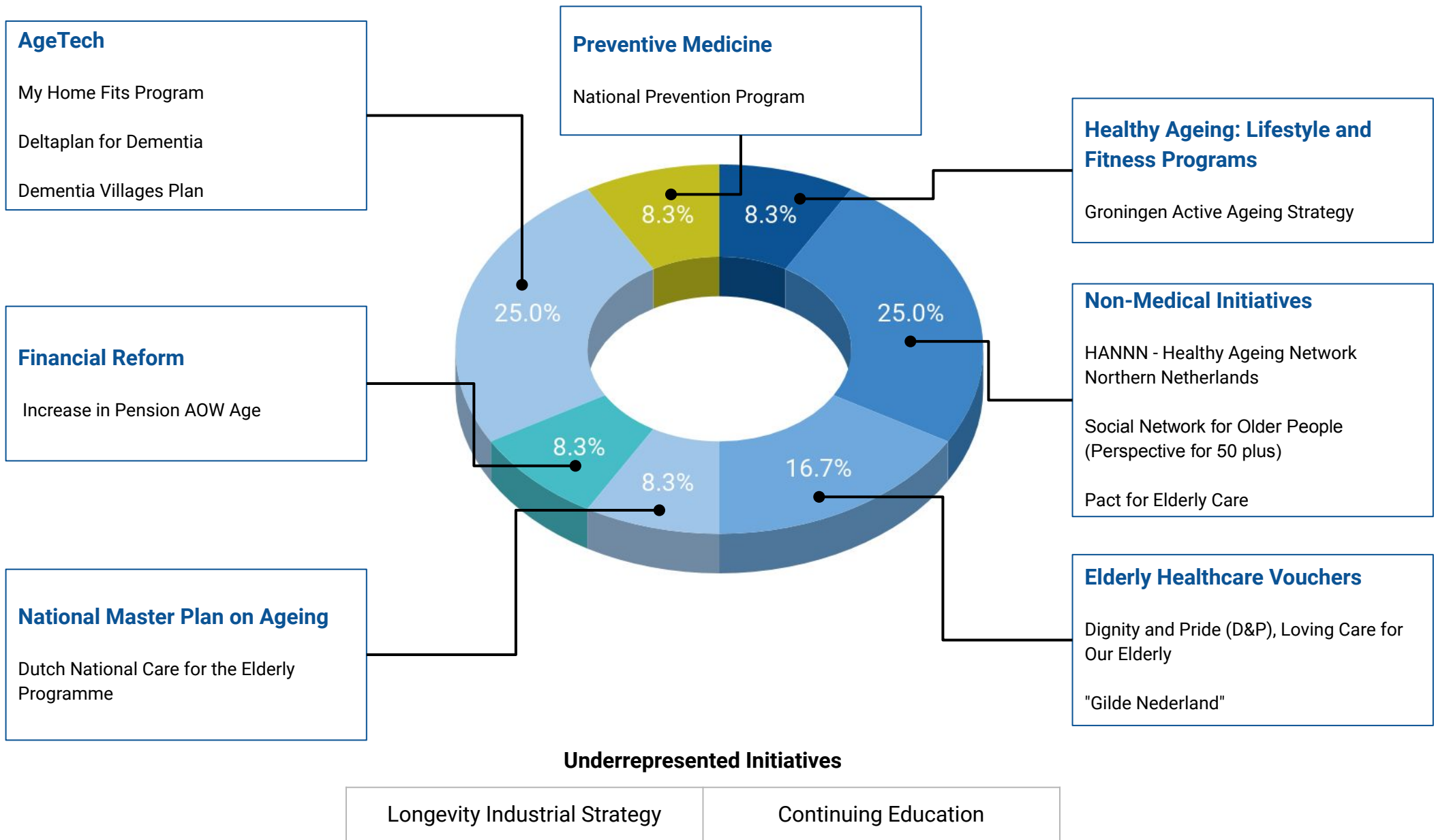
Life Expectancy	Both sexes life expectancy (2019)	81.6 years
	Male life expectancy (2018)	80.0 years
	Female life expectancy (2018)	83.2 years
GDP	GDP per capita, current prices (2018)	53.02 thousand (\$)
	GDP per capita, PPP (2018)	58.25 thousand (\$)
	GDP, current prices (2018)	914 billion (\$)
Population Ageing	Rate of population ageing	4 (2007-2017)
	Aged over 65 (2018)	19.1%
	Age dependency ratio (2017)	29%
Healthcare Efficiency	Health expenditure (2017)	10.1% of GDP
	Health expenditure per capita (2017)	5.386 thousand (\$)
	Healthcare efficiency score (2018)	50.8
Retirement	Total # retired	3 217 307
	Retired people proportion	19%
	Normal retirement age (Man/Woman)	67 years / 65 years
	Early retirement age (Man/Woman)	52 years / 52 years

## Longevity Initiatives

- Age of relevant initiatives: **12 years**
- **National Master Plan on Ageing**
- **12** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- Dedicated minister for elderly



# Netherlands Initiatives Level of Comprehensiveness



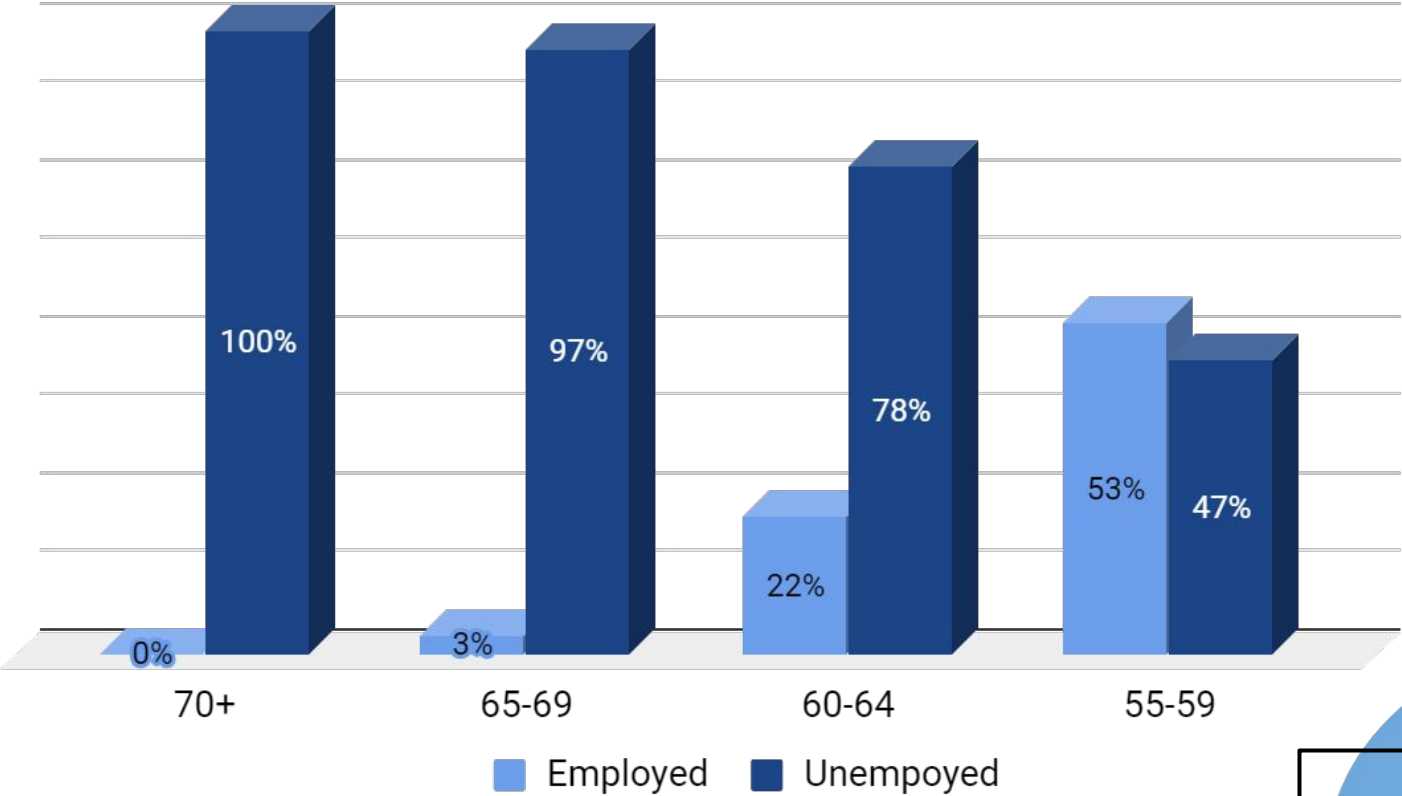


# Netherlands Age/Employment Range

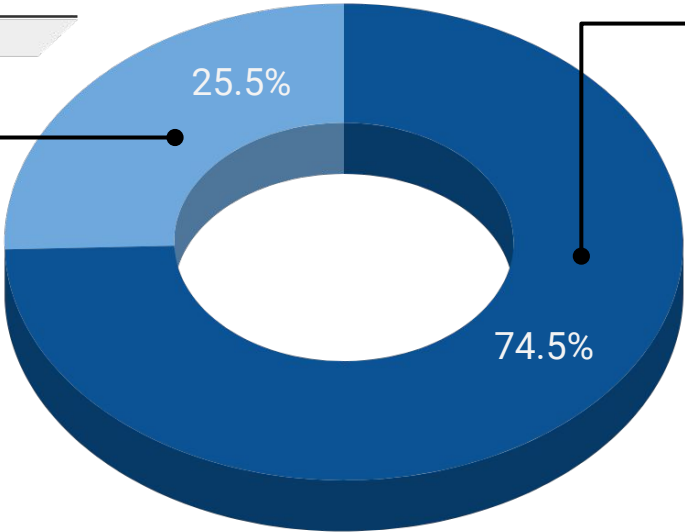


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Fraction of the Unemployed by Age



Percent of people under 60



Percent of people over 60

# De Hogeweyk, Model Village for People with Dementia

Situated in the town of Hogeweyk in Weesp, Netherlands, De Hogeweyk began in 1993 as a typical hospital-style nursing home. But the staff soon realized there was a better, more humane, way to offer care.

It has since been designed specifically as a pioneering care facility for elderly people with dementia. Dubbed “Dementia Village” by CNN, Hogeweyk is roughly the size of 10 football fields, a space where residents are given the chance to live seemingly normal lives.

Carers, doctors and nurses work around the clock to provide the 152 residents the necessary 24-hour care



Residents live in groups of six or seven to a house, with one or two caretakers. It features 23 uniquely stylized homes, furnished around the time period when residents' short-term memories stopped properly functioning. Residents are cared for by 250 full- and part-time geriatric nurses and specialists, who wander the town and hold a myriad of occupations in the village, like cashiers, grocery-store attendees, and post-office clerks. Finances, being a tricky life skills for dementia or Alzheimer's patients, are taken out of the equation, and there is no currency (everything is included with the family's payment plan)

The first ideas for the village came about in 1992, when the management team at the traditional nursing home Hogeweyk after discussing that if their parents became affected by Alzheimer's in the future they would not want them to endure hospital-like care. After a series of research and brainstorming sessions in 1993, the outcome was that normality should prevail in all kind of aspect of nursing home care. This vision was called "normalized small scale living for people with dementia". They decided that people generally prefer to surround and interact with other like-minded people of similar backgrounds and experiences. The arrangement at Hogeweyk provides this by ensuring that residents with similar backgrounds, norms and values continue to live closely together.



My Home Fits (Mijn Huis Op Maat) is a practical tool for awareness and information for older people on what improvements are possible in their own homes in order to leave independently for as long as they want

It takes the form of a web platform containing all information about getting older and living independent at your own home. The heart of the platform is the Home Test: an online list of questions which enables you to check possible improvements to your home for independent living. This test (free) provides you with your personal checklist.

Local communities can participate in the Home Test: they 'subscribe' to the platform which opens up a more extensive set of solutions to the inhabitants who fill out the Home Test. For each point of improvement they are provided with several solutions that can make things safer and more comfortable in their homes.

Apart from the information, the Home Test, the Mijn Huis Op Maat platform hosts a search engine for entrepreneurs that provide solutions for older people and can take care of things that need doing in their home. Mijn Huis Op Maat is a platform which can bring together the local authorities, the elder workers, older peoples associations, housing associations, care organisations and local entrepreneurs to cooperate and offer a simple and straightforward tool to their inhabitants, clients and customers. The tool is used also as an awareness tool to point older people at their possibilities to take the lead in their lives and make sustainable choices on how they want to live when older.

Groningen Active Ageing Strategy is an intervention programme to enhance the health literacy, lifestyle, and resilience of community-dwelling, sedentary, frail older adults in deprived areas.

The project consists of :

- 1) A multifaceted exercise programme where participants are supported to meet the Dutch Norm on Physical Activity;
- 2) Resilience training focusing on coping with fear, boosting self-confidence, setting boundaries, and gaining control of emotions and behaviour;
- 3) Social skills training focussed on improving social skills and making and maintaining social contacts;
- 4) Education on several health and social topics, including physical exercise, smoking, alcohol intake, nutrition, and relaxation. This intervention is designed to last 9 months.

Participants receive self-management training for a duration of 6 months following the intervention, to improve and maintain health behaviour. This training teaches participants how to implement lessons learned during the intervention into daily practice. The following 18 months are used to implement and sustain the intervention by aligning with local policy plans and supporting participants to be self-sufficient.

The aim of the intervention is to promote 'healthy ageing' in the target population, with a focus on increasing physical activity amongst the elderly, developing resilience to cope with ageing, increasing social skills to make contact with others, and increasing knowledge on aspects of healthy living.



Ministerie van Volksgezondheid,  
Welzijn en Sport



The cooperative Deltaplan for Dementia is the Dutch national platform to address and manage the growing problem of dementia.

Deriving its name from the Dutch water works that protects a large area of land from the sea, Deltaplan dementia works closely together with private and public members based on three important pillars; research, healthcare/support and a dementia friendly society.

- Eight-year programme (2013 – 2020)
- Has a special dementia research and innovation programme, currently working on over hundred different research projects
- Aims to focus on Improvement of Health Care to ensure that patients of today can continue to live at home as long as possible, supported by appropriate professional and informal care
- Also aims to stimulate a society that is more dementia friendly

Deltaplan Dementia is threefold and relies on three pillars:

- Facilitating research to prevent or cure dementia
- Care enhancement
- Creating a dementia friendly society.

The responsibility for implementing the pillars rest with the most professional organisations, with a strong contribution of members from their own commitment, expertise and background. The board facilitates and monitors the execution and progress.



The purpose of Healthy Ageing Network Northern Netherlands (HANNN) is to achieve innovations and fundamental breakthroughs that will entail structural improvements in the conditions for healthy ageing, and so stimulate economic activities in the region. It is a knowledge and development cluster in the field of healthy ageing and aims to stimulate the economic growth of the Northern Netherlands. To achieve this goal it brings together knowledge institutions, companies in the life science, biotech, pharmacy, ICT, nutrition industry sector and local authorities. The work of HANNN is focused around five areas: Care & Cure, Food & Nutrition, Healthy Lifestyle, Life Sciences and Medical Technology. The Network is involved in many projects in which it can bring added value through its potential in strengthening the collaboration between universities, medical institutions and businesses. HANNN intends to deliver to following opportunities for its members and partners:

- Expanding and further enhancing networks
- Facilitating business development
- Combining concrete needs
- Boosting the (inter)national profile and market strength
- Building relations with comparable knowledge clusters in Europe.

The Northern-Netherlands region leads the pack in Europe when it comes to Healthy Ageing, according to the European Commission. On Wednesday 13 July 2016 it presented a ranking of European Reference Regions in the field of Active and Healthy Ageing. No less than 78 regions from 22 Member States sent in an application to be on the list on which ranking is determined by the number of stars awarded. The Northern-Netherlands -under the leadership of the Healthy Ageing Network Northern-Netherlands (HANNN)- achieved the highest possible score of 4 stars according to the ranking of European Reference Regions in the field of Active and Healthy Ageing, an honor bestowed upon only a very select group of Reference Sites. The Northern-Netherlands is the only Dutch region to receive the coveted four-star status.





The Dutch National Care for the Elderly Programme was an initiative organized by the Netherlands Organisation for Health Research and Development (ZonMw) between 2008 and 2016.

The aim of the programme was to collect knowledge about frail elderly, to assess their needs and to provide person-centred and integrated care better suited to their needs. The budget of EUR 88 million was provided by the Dutch Ministry of Health, Welfare and Sports. Putting the needs of elderly people at the heart of the programme and ensuring their active participation were key to the programme's success.

The programme outcomes included the establishment of eight geriatric networks around the medical universities with 650 organisations and the completion of 218 projects. These projects, involving 43,000 elderly people and 8500 central caregivers, resulted in the completion of 45 PhD theses and the publication of more than 400 articles and the development of 300 practice toolkits, one database and a website, [www.beteroud.nl](http://www.beteroud.nl). The Dutch National Care for the Elderly Programme has since developed into a movement and continues under the consortium Ageing Better, made up of eight organisations. Through the use of ambassadors, Ageing Better promotes the message that "ageing is not a disease but a new phase of life".



An aerial night view of Singapore's skyline, featuring the Marina Bay Sands and other skyscrapers. The image is overlaid with a semi-transparent blue layer and a yellow border with decorative corner elements.

# Singapore

***Tiger Economy, Diverse Government Programs,  
Strong Focus on Continuing Education  
for the Elderly and AgeTech***



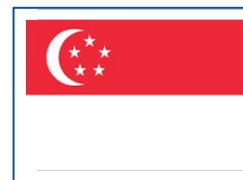
# Summary of Relevant Government-Led Longevity Initiatives in Singapore

- The Singapore Government has launched a number of progressive longevity-related initiatives, including:
  - Preventive and active ageing programs that start at the early age of 40.
  - The launch of The Silver Academy, a continuing-education program that offers 900 courses, currently with 21,000 students enrolled;
  - Barrier-free access for those with restricted mobility;
  - Traffic junctions that provide the elderly with more time to cross the street;
  - Silver Generation Ambassadors who visit citizens when they turn 65 to determine their needs, and offer referrals to relevant services where necessary;
  - Increased funding by the Health Ministry to healthcare infrastructure like hospitals, nursing homes and day care facilities;
  - A program that screens five key age-related conditions for \$5 or less.
- These initiatives are very good first steps toward making Healthy longevity a major component of their national strategic agenda, but the Government lacks a core focus on financial reform and advanced biomedicine. Despite its efficient, technocracy-driven structure, Singapore currently lacks a coordinated national development plan for Healthy longevity likely to deliver tangible results.

- 2007 — **Silver Infocomm Junctions launched by the government agency Infocomm and Media Development Authority.**  
Established "a network of community-based digital learning hubs for people aged 50 and older".
- 2011 — **National Population and Talent Division inaugurated by prime minister.**  
National Population and Talent Division run a group called Population.sg that "brings together people with diverse backgrounds to discuss and write about population matters in Singapore..."
- 2015 — **The National Silver Academy launched.**  
A continuing-education program that offers 900 courses, currently with 21,000 students enrolled, organised by the Singaporean Ministry of Health.
- 2015 — **Modern Ageing incubator, launched.**  
To identifying, developing, and scaling up startups that focus on products and services to meet the needs of older adults.
- 2016 — **The ministerial Committee for Ageing published their Action Plan for Successful Ageing.**  
The ministerial committee for ageing had launched the Plan to solve a wide range of issues related to ageing







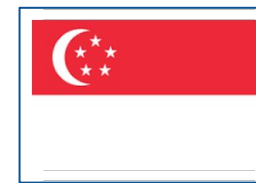
Life Expectancy	Both sexes life expectancy (2019)	85.7 years
	Male life expectancy (2018)	80.8 years
	Female life expectancy (2018)	86.1 years
GDP	GDP per capita, current prices (2018)	65.63 thousand (\$)
	GDP per capita, PPP (2018)	103.72 thousand (\$)
	GDP, current prices (2018)	372.81 billion (\$)
Population Ageing	Rate of population ageing	6 (2007-2017)
	Aged over 65 (2018)	18.8%
	Age dependency ratio (2017)	18%
Healthcare Efficiency	Health expenditure (2017)	2.2% of GDP
	Health expenditure per capita (2017)	1.948 thousand (\$)
	Healthcare efficiency score (2018)	85.6
Retirement	Total # retired	725 193
	Retired people proportion	13%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	62 years / 62 years

## Longevity Initiatives

- Age of relevant initiatives: **12 years**
- **15** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **1** initiative involves research or R&D of medicines that directly impact on ageing



# Singapore Initiatives Level of Comprehensiveness



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## Non-Medical Initiatives

Senior Citizen Concession Card  
National Innovation Challenge on Active and Confident Ageing Research

## National Master Plan on Ageing

Action Plan for Successful Ageing

## Continuing Education

Media Development Authority Striving to Improve Elderly Digital Literacy  
National Population and Talent Division's SkillsFuture Program  
Re-employment of Older Workers Guidance

## Financial Reform

Lease Buyback Scheme (LBS)  
Medisave

## Geroscience R&D

Singapore Parkinson's Disease Translational Clinical Programme

## Preventive Medicine

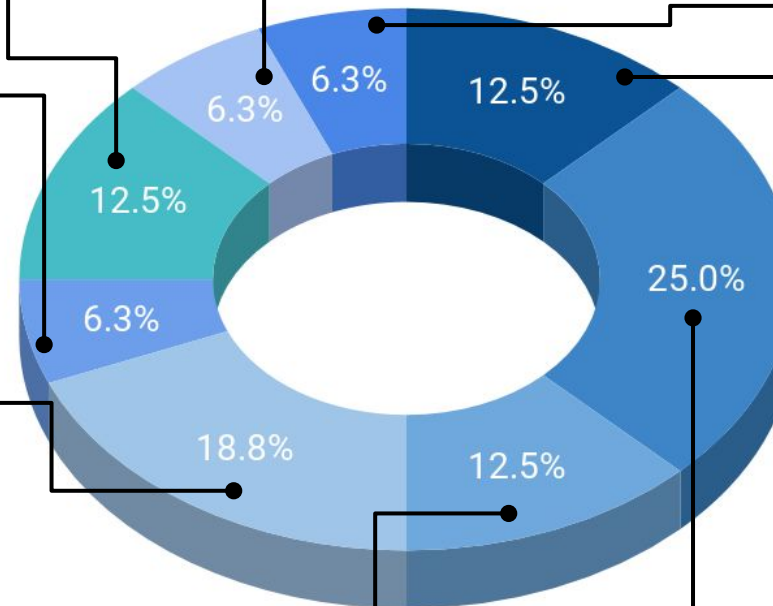
"Advancing Precision Medicine for Cardiovascular Disease and Diabetes in Asian Populations" programme

## AgeTech

SHINESeniors Program  
Licensing Experimentation and Adaptation Programme

## Elderly Healthcare Vouchers

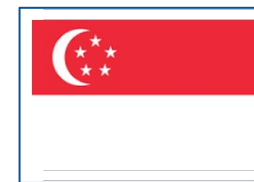
ComCare Long Term Assistance (also known as Public Assistance)  
Enhancement for Active Seniors (EASE)  
Pioneer Generation Package  
Silver Support Scheme



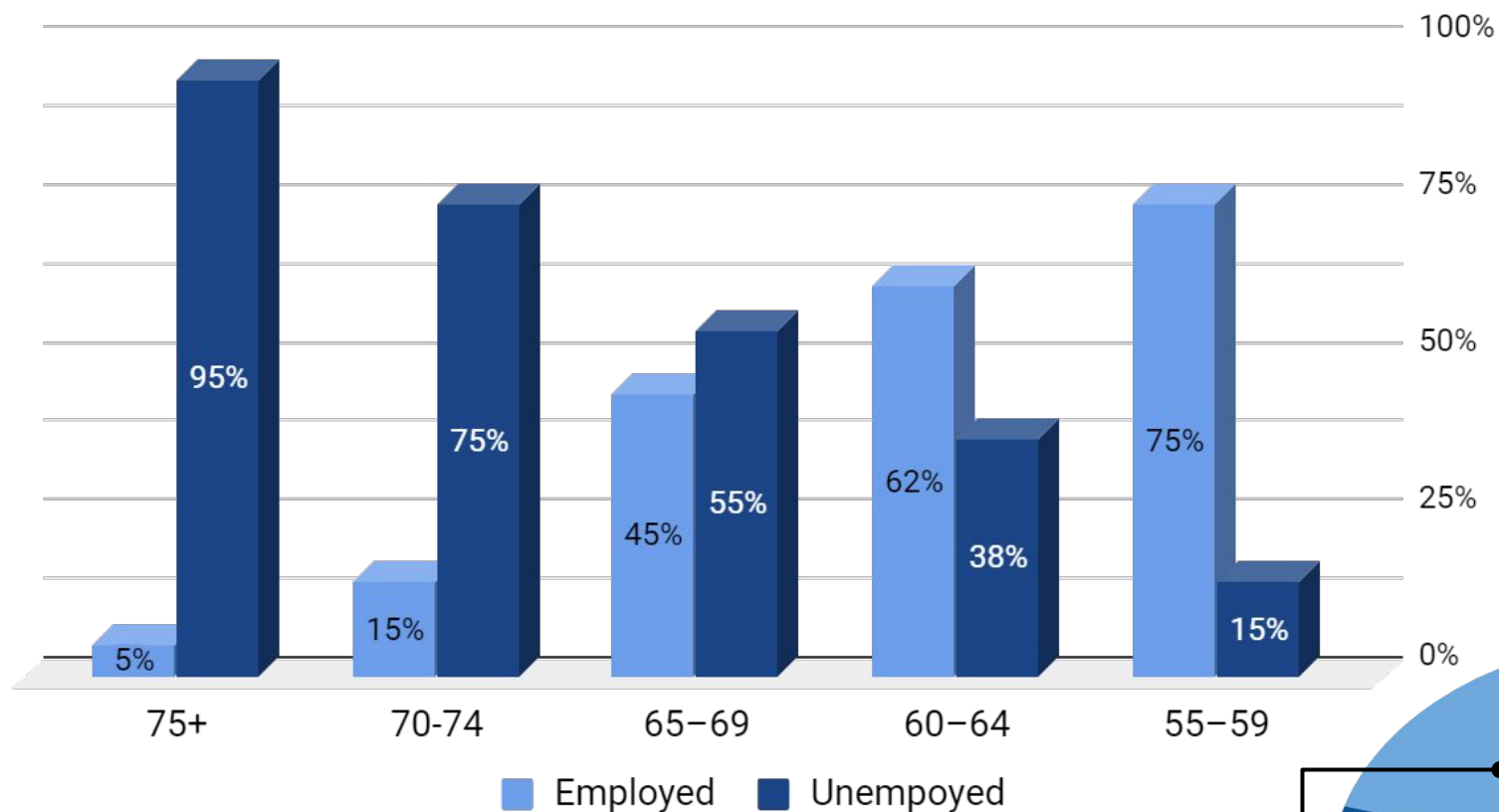
## Underrepresented Initiatives

Longevity Industrial Strategy

Healthy Ageing: Lifestyle and Fitness Programs

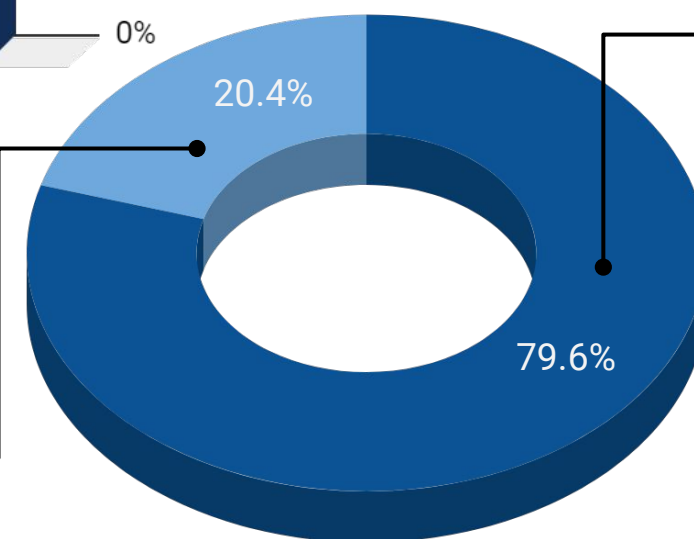


## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





## What is the Singaporean Ministry of Health Doing to Combat the Problem of Ageing Population?

In a recent the *Straits Times*-AIA roundtable entitled "Managing Singapore's Health with an Ageing Population: What more needs to be done?", Singapore's Senior Minister of State for Health, Dr. Amy Khor, noted that in 2015, the ministerial committee for ageing had already launched the Action plan for Successful Ageing, consisting of a multi-pronged approach that includes:

- Preventive and active ageing programs that start at the early age of 40;
- The launch of The Silver Academy, a continuing-education program that offers 900 courses, currently with 21,000 students enrolled;
- Barrier-free access for those with restricted mobility;
- Traffic junctions that provide the elderly with more time to cross the street;
- Silver Generation Ambassadors who visit citizens when they turn 65 to determine their needs, and offer referrals to relevant services where necessary;
- Increased funding by the Health Ministry to healthcare infrastructure like hospitals, nursing homes and day care facilities;
- A program that screens five key age-related conditions for \$5 or less.

Commenting on the progress of these initiatives over the past several years, Dr. Khor stated "I think few places in the world, if any, do this. It is being done [here] systematically, and not on an ad hoc basis," adding that the 2015 action plan is a "living document" and that "we have to build up on it and as we implement programs, we learn and we refine and implement other new programs that may be useful."

## Action plan for successful ageing

### CHANCE TO LEARN

A new National Silver Academy, which plans to provide more than 30,000 places for seniors by 2030. These could range from picking up IT skills and jewellery making to ukulele lessons and exam-free university courses.

### SHOT AT VOLUNTEERISM

The annual President's Challenge will be used as a platform to kick-start a volunteer movement for seniors interested in giving back to the community.

### KEEPING HEALTHY

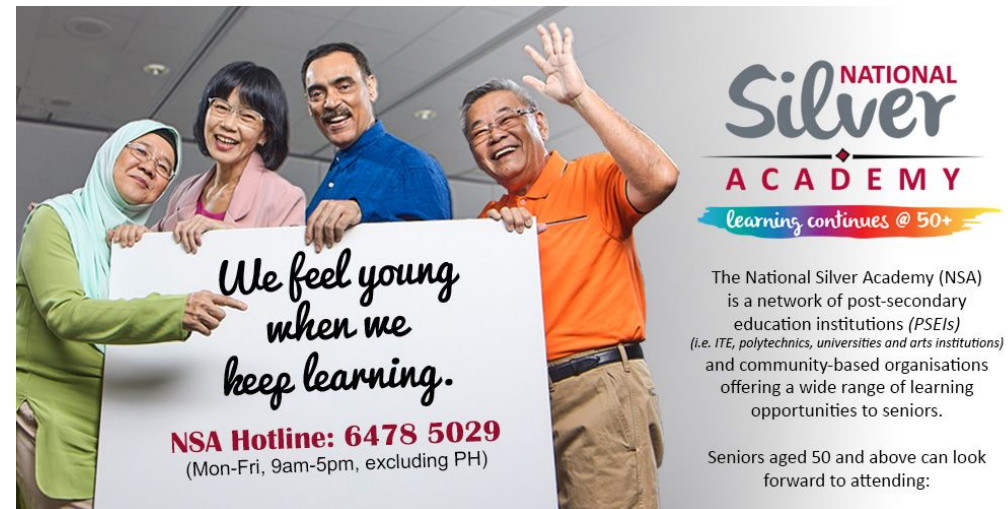
Educating seniors on issues like dementia and nutrition. By 2030, some 400,000 seniors aged 50 and older will have come under the National Seniors' Health Programme.

### INFRASTRUCTURE UPGRADES

Providing opportunities for the old to mix with the young. Over the next 10 years, 10 new Housing Board developments will get childcare and eldercare facilities side-by-side. Public transport and other public amenities will also be made more senior-friendly.

### AGEING RESEARCH

Up to \$200 million could be set aside for research on ageing - how to delay the onset of dementia, for example, or create truly ageless workplaces.





# Singapore Media Development Authority Striving to Improve Elderly Digital Literacy Through “Silver Infocomm Junctions” Program

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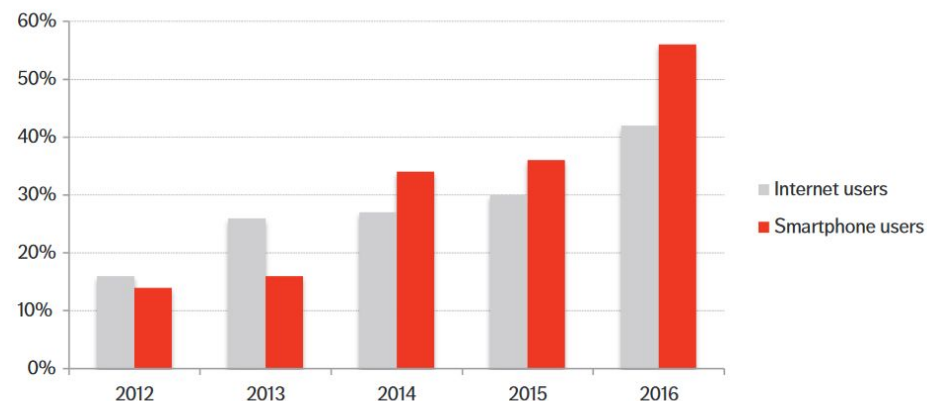
## Bridging the Divide Between Singapore’s Elderly and Digital Literacy

Singapore is a global leader in its Information Communications Technology (ICT) infrastructure, and was ranked #1 globally in the most recent World Economic Forum's Global Networked Readiness Index. It is no surprise, then, that the Singaporean government has been working for several years to promote technological engagement among its elderly population and to proactively develop its AgeTech industry through funding and partnerships with relevant stakeholders. However, interest in Singapore's burgeoning AgeTech scene has been relatively limited to health technology startups.

In recent years, adults 65+ in Singapore have been adapting to the internet and smartphones, with internet usage increasing from around 16% in 2012 to over 40% and smartphone usage to over 50% in 2016. Thus, in just four years internet usage among the elderly had tripled, and smartphone usage had quadrupled. One way the government proactively bridged the divide between the elderly and digital technology is through the Silver Infocomm Junctions, launched by the government agency Infocomm and Media Development Authority in 2007 to establish "a network of community-based digital learning hubs for people aged 50 and older". The program provides personalized training in digital literacy at the relatively low cost of 8-10 SGD (6-7.6 USD) per hour.

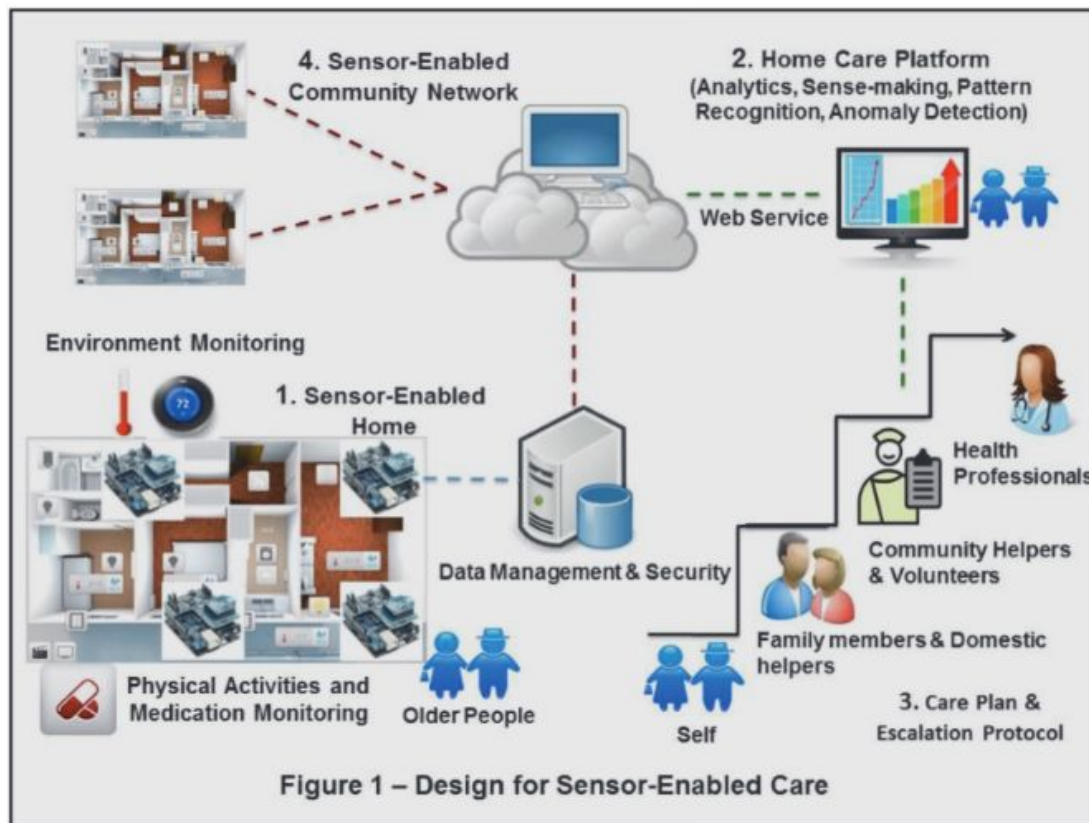
The successful program educated the elderly in computer literacy and the internet, and also taught more advanced processes such as managing banking transactions online, sharing large files and editing photos. The organization has carried out more than 80,000 training sessions by the end of 2015.

**Figure 5. Digital Technology Usage Age 60 Years and Older, 2013-2016**



Sources: Annual Surveys on Infocomm Usage in Households and by Individuals 2014, 2015, and 2016





## The Singaporean Government is Actively Promoting the Development of a Robust AgeTech Sector

In order to accelerate the development of Singapore's digital technologies, in 2014 the government launched its Smart Nation Plan, which envisions the future Singapore as a place where *"people live meaningful and fulfilled lives, enabled seamlessly by technology, offering exciting opportunities for all."* Thus far, the government has allocated SGD 4.8 billion (USD 3.5 billion) in funding to build the nation's digital infrastructure, digital analytics and digital citizenship and cybersecurity programs. The government also specifically emphasized the need to improve digital literacy among its elderly citizens in the plan, and allocated funding to a subset of the plan titled SHINESeniors (Smart Homes and Intelligent Neighbors to Enable Seniors), an R&D program actuated through Industry- university partnerships.

The program aims to "develop an integrated home system that enables ageing in place, consisting of non-intrusive sensors that detect motions and monitor medical conditions, as well as function buttons that facilitate communication with care providers."

In addition to funding, the government is also supporting the program by facilitating partnerships with care providers, and testing the technology in 100 public housing apartments free of charge in June 2018, with plans to expand to 300.

## SHINESeniors: Smart Homes and Intelligent Neighbors to Enable Seniors



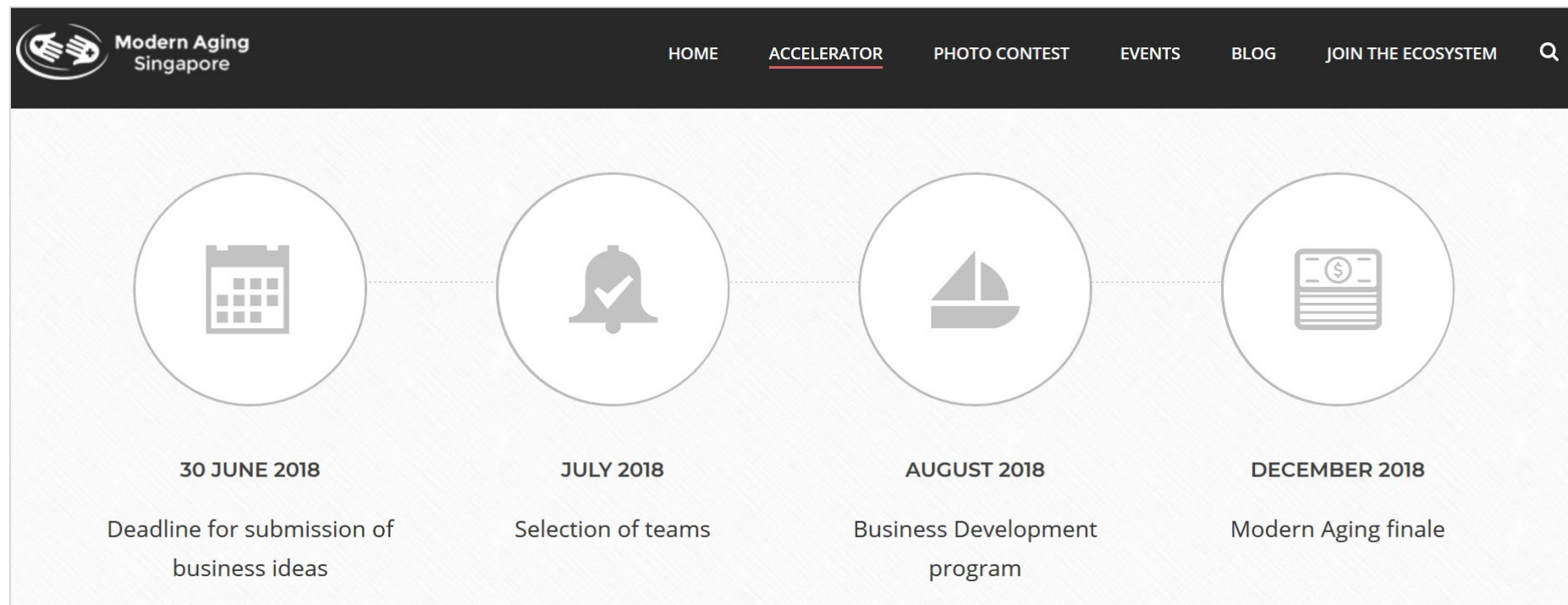
### Legend

Fixed   Semi-Fixed

-  GW Gateway
-  PIR Passive Infra-Red
-  BD Bed
-  DC Door Contact
-  WU Water Usage
-  MB Medication Box

## The Singaporean Government is Actively Promoting the Development of a Robust AgeTech Sector

Given the apathy from private sectors in growing Singapore's AgeTech landscape, the government is also providing seed funding for startups looking to improve the quality of life of the elderly through digital technologies, in hopes of propelling the industry landscape into action. The program, the Modern Ageing incubator, launched in 2015 with the aim of "identifying, developing, and scaling up startups that focus on products and services to meet the needs of older adults. "Every year Modern Ageing selects 10 companies to enter its 10-week program, where startups are mentored, provided with seed funding of up to SGD 50,000 (USD 36,300) and given the opportunity to pitch investment deals to an audience of investors and corporations.





# Singaporean National Population and Talent Division's SkillsFuture Program

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In addition to the Ministry of Health, other government divisions are also striving to make Singapore one of the most progressive countries with regards to solving the ageing population problem in the years to come.

One such agency is the National Population and Talent Division, which runs a group called Population.sg that *"brings together people with diverse backgrounds to discuss and write about population matters in Singapore, focusing on demographic challenges in Singapore and what needs to be done to create a strong Singaporean core with good opportunities and high-quality living for Singaporeans."*

**"The SkillsFuture program is a game changer and creates a platform that facilitates engagement of various stakeholders. As a result, the whole society is thinking about lifelong learning right now."**

- CHRISTOPHER GEE, Senior Research Fellow at the Institute of Policy Studies at National University of Singapore

**"Since we cannot double the care capacity within a short term to meet the increasing demand driven by the ageing population, the capacity building needs to be complemented with innovation."**

- JULIAN KOO, Co-Founder of Jaga-Me

**"The incubation program has created a network that brings stakeholders, such as service providers and young entrepreneurs, together to exchange ideas and promote better understandings of ageing issues."**

- WONG POH KAM, Director of Entrepreneurship Centre, National University of Singapore



## Retirement System Reform in Singapore

In 2011 Singapore introduced its Retirement and Re-employment Act, its largest step toward retirement system reform in its history. Part of this legislation required employers to re-employ workers past the age of 62 and before the age of 65.

Prior to this, in 2008, it released guidance titled Tripartite Advisory on the Re-employment of Older Workers on best practices for negotiation re-employment contracts between older workers and employers, and expanded these guidelines into the

**“TriCom creates opportunities for the government perspectives, such as cost concerns by employers and payment fairness concerns by employees (which) help it to make effective decisions.”**

- Walter Theseira, Associate Professor of Economics at Singapore University of Social Science

2011 Tripartite Guidelines on the Re-Employment of Older Employees in 2011.

Since being enacted, close to 98% of workers above the age of 62 have been effectively re-employed, and Singapore's labor force participation rate as of 2016 grew 30% in the space of just five years.

Nonetheless, work remains to be done. Commenting on the effectiveness of Singapore's re-employment efforts, Amos Garcia of the Milken Institute Asia Center, based in Singapore, has stated that “when re-employed, older workers are usually put at a different job position, which are oftentimes paid less, or require low skills, due to skill gaps and ageism”.





# Other Singaporean Government-Led Initiatives Promoting Healthy Ageing and Enabling Elderly Functionality and Well-Being

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There are 7 different ways the government of Singapore has developed to help seniors entering their silver years. The Singapore official government website presented the following schemes:

## 1. Medisave

Medisave is a national medical savings scheme which helps individuals put aside part of their income into their Medisave Accounts. This can be used to pay for their future personal or immediate family member's hospitalisation and certain outpatient expenses incurred at any hospital in Singapore.

## 2. Enhancement for Active Seniors (EASE)

Through EASE, seniors can enjoy subsidies of up to 95% to install improvement items such as grab bars and slip-resistant bathroom floors to make it more elder-friendly.

## 3. ComCare Long Term Assistance (also known as Public Assistance)

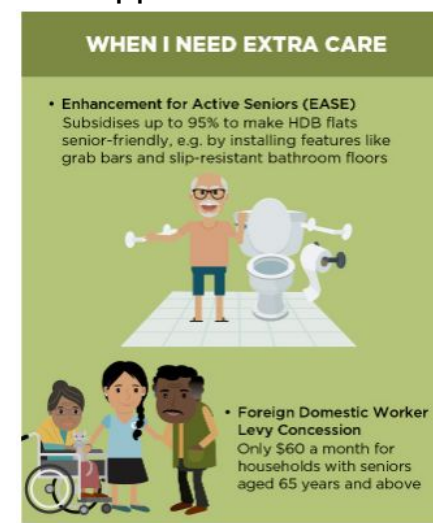
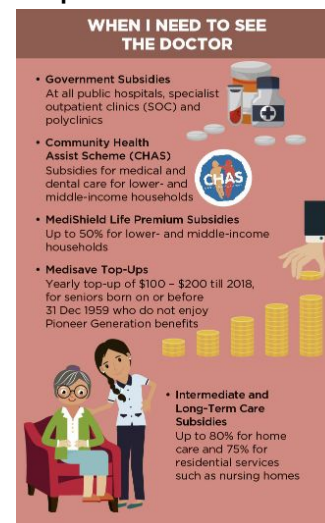
Seniors can receive up to \$1,180 in cash assistance (depending on household size) for those who are permanently unable to work due to old age, illnesses or unfavourable family circumstances. Those who qualify may also receive additional aid to help those with recurring hygiene essentials or consumables such as adult diapers and nutritional milk supplements. Additional medical assistance will also be available.

## 4. Silver Support Scheme

From end-Jul 2016, the government gave payouts of \$300 – \$750 (depending on type of HDB flat they live in) every three months for the bottom 20% of seniors who had low incomes through life and little or no family support. This is on top of the monthly cash assistance provided by the ComCare Long Term Assistance Scheme to cover their daily living expenses.

Source:

[gov.sg](https://www.gov.sg)

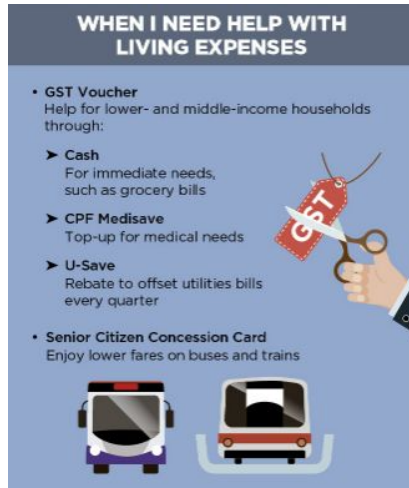




## 5. Pioneer Generation Package

Singaporeans born on or before 31 December 1949, and obtained citizenship on or before 31 December 1986 can enjoy the benefits of the Pioneer Generation Package!

Benefits include special subsidies for MediShield Life premiums, annual Medisave top-ups (up to \$800 a year for life) and an additional 50% off subsidised services and medication at polyclinics and Specialist Outpatient Clinics (SOC) in public hospitals.



## 6. Lease Buyback Scheme (LBS)

Seniors who live in a 4-room or smaller flat will be able to use this scheme as an additional monetisation option. Through the scheme, you can sell part of your flat's lease to HDB to receive a stream of income in your retirement years, while continuing to live in it. You can choose to retain the length of lease based on the age of the youngest owner. The proceeds from selling part of your flat's lease will be used to top up your CPF Retirement Account (RA), which earns you up to 5% interest.

## 7. Senior Citizen Concession Card

Senior citizens can enjoy lower rates on buses and trains with the launch of the Off-Peak Pass (OPP) on 5 July 2015. This gives senior citizen cardholders one more option when purchasing their travel pass, on top of the Hybrid Concession Pass. Now seniors can be even more active in pursuing their hobbies, visiting friends and loved ones, or even volunteering for their favourite causes.



# South Korea

***Tiger Economy, Master Plans for Age-Friendly  
Cities and Care Services***





# Summary of Relevant Government-Led Longevity Initiatives in South Korea

- In 2013 the Seoul metropolitan government established the “2020 Master Plan for the Aged Society”.
- In June 2013 Seoul joined the WHO Global Network of Age-friendly Cities and Communities.
- In November 2018, South Korea’s Ministry of Health and Welfare (MOHW) announce that it will be laying the foundation for comprehensive community care to provide the elderly with residential, medical, nursing and care services in their homes and neighborhoods by 2025, shortly before Korea becomes a super-aged society.
- The government is active in relation to preventive medicine, i.e. there is regular management of the diseases and lifestyle habits of people with high blood pressure or diabetes at local clinics (some 1,400 units), using smartphones, etc.
- There is an active development of a Regenerative Medicine Industry, as a heavy investment was made in a “Post-genome Multi-ministry Gene Project” which is a joint initiative of the Ministry of Welfare, Ministry of Future Planning, Ministry of Industry.
- In 2015 50+ policy affecting retirees life vision started. It is an innovative approach that encourages elder people to take active social actions. This programme focuses on three key points “Learning and Exploration”, “Jobs and Social Engagement” and “Culture and Infrastructure”. 50+ services include personalised counselling, education, and new job models.
- As South Korean population is actively ageing and is poised to become the first one where life expectancy will exceed 90 years, the country’s government is making the first steps towards a Healthy Longevity, though South Korea still lacks a coordinated national strategy to handle a super-aged society and all its implications.

2010

**Preparations for Seoul Masterplan Begin**

Work on what will become the Seoul metropolitan government *Master Plan for the Aged Society*.



SEOUL METROPOLITAN  
GOVERNMENT

2011

**Masterplan Implementation begins**

Work on implementation of groundwork begins

2013

**Master Plan Establishment**

In 2013 the Seoul metropolitan government established the “2020 Master Plan for the Aged Society”.

June

2013

**Joining the WHO Network**

In June 2013 Seoul joined the WHO Global Network of Age-friendly Cities and Communities.



2018

**Foundation for Providing the Elderly With Services**

In November 2018, South Korea’s Ministry of Health and Welfare (MOHW) announce that it will be laying the foundation for comprehensive community care to provide the elderly with residential, medical, nursing and care services in their homes and neighborhoods by 2025, shortly before Korea becomes a super-aged society.



보건복지부

South Korea  
Ministry of  
Health and  
Welfare



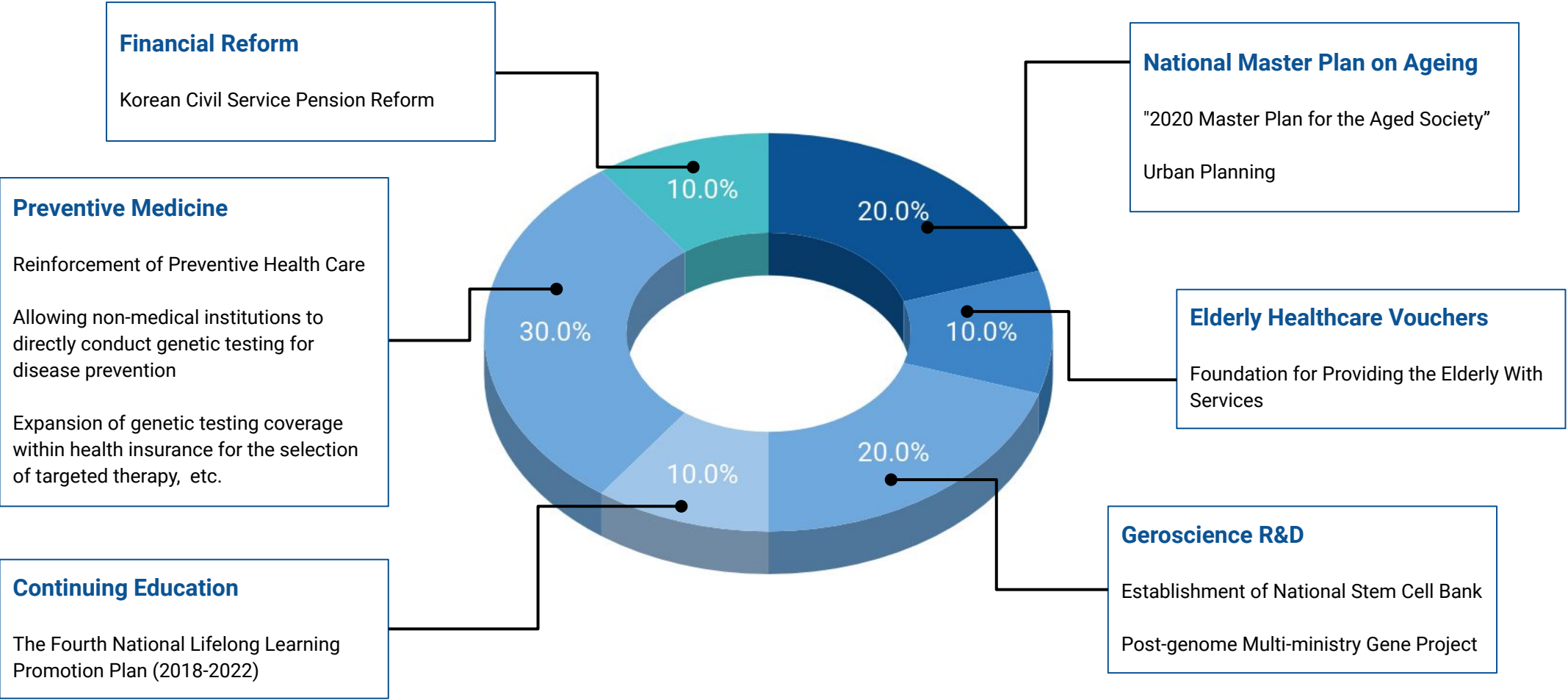
Life Expectancy	Both sexes life expectancy (2019)	80.9 years
	Male life expectancy (2018)	79.5 years
	Female life expectancy (2018)	85.6 years
GDP	GDP per capita, current prices (2018)	31.94 thousand (\$)
	GDP per capita, PPP (2018)	42.98 thousand (\$)
	GDP, current prices (2018)	1 660 billion (\$)
Population Ageing	Rate of population ageing	4.3 (2007-2017)
	Aged over 65 (2018)	14.2%
	Age dependency ratio (2017)	19%
Healthcare Efficiency	Health expenditure (2017)	7.6% of GDP
	Health expenditure per capita (2017)	2.897 thousand (\$)
	Healthcare efficiency score (2018)	67.4
Retirement	Total # retired	7 161 073
	Retired people proportion	14%
	Normal retirement age (Man/Woman)	60 years/ 60 years
	Early retirement age (Man/Woman)	50 years/ 50 years

## Longevity Initiatives

- Age of relevant initiatives: **9 years**
- **11** of WHO age-friendly cities and communities
- **3** initiatives focused on non-medical improvement of quality of life
- **2** initiatives focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



# South Korea Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

Healthy Ageing: Lifestyle and Fitness Programs	Non-Medical Initiatives	Longevity Industrial Strategy	AgeTech
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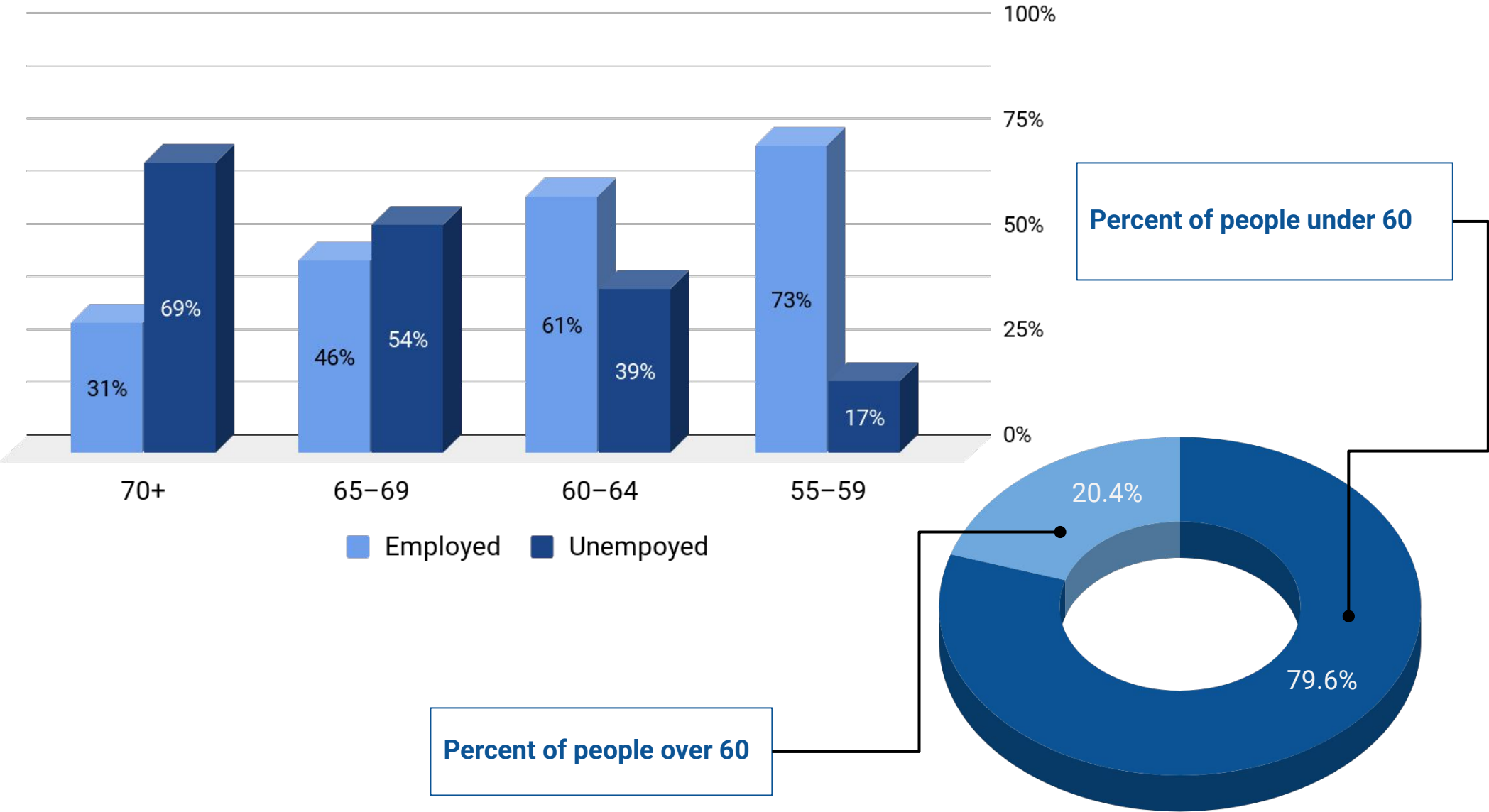




# South Korea Age/Employment Range



Fraction of the Unemployed by Age





## Age Friendly Seoul



SEOUL METROPOLITAN  
GOVERNMENT

2010 Year

### Setting strategy

Setting long-term strategy to  
prepare the aging society  
(2020 master plan of aged society)

2011 Year

### Laying the groundwork

Consist of implementation  
system and enactment of

2012 Year

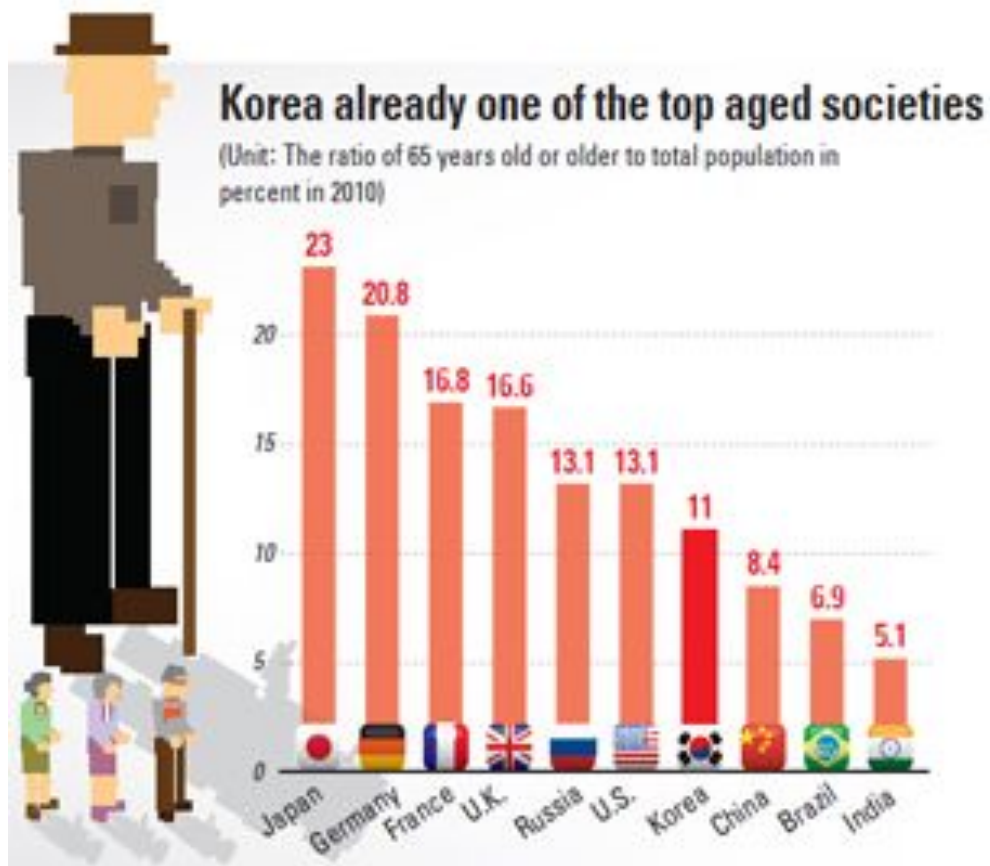
### Establishment of plan

The 1st Action plan is  
established and announced

2013 Year

### Join the GNAFCC

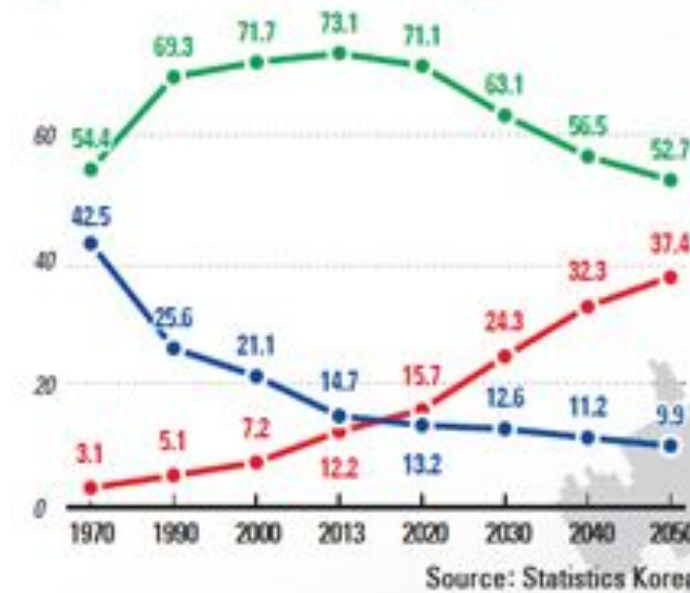
Became the 139th GNAFCC  
member city in June 2013



### Rapidly aging Korean society

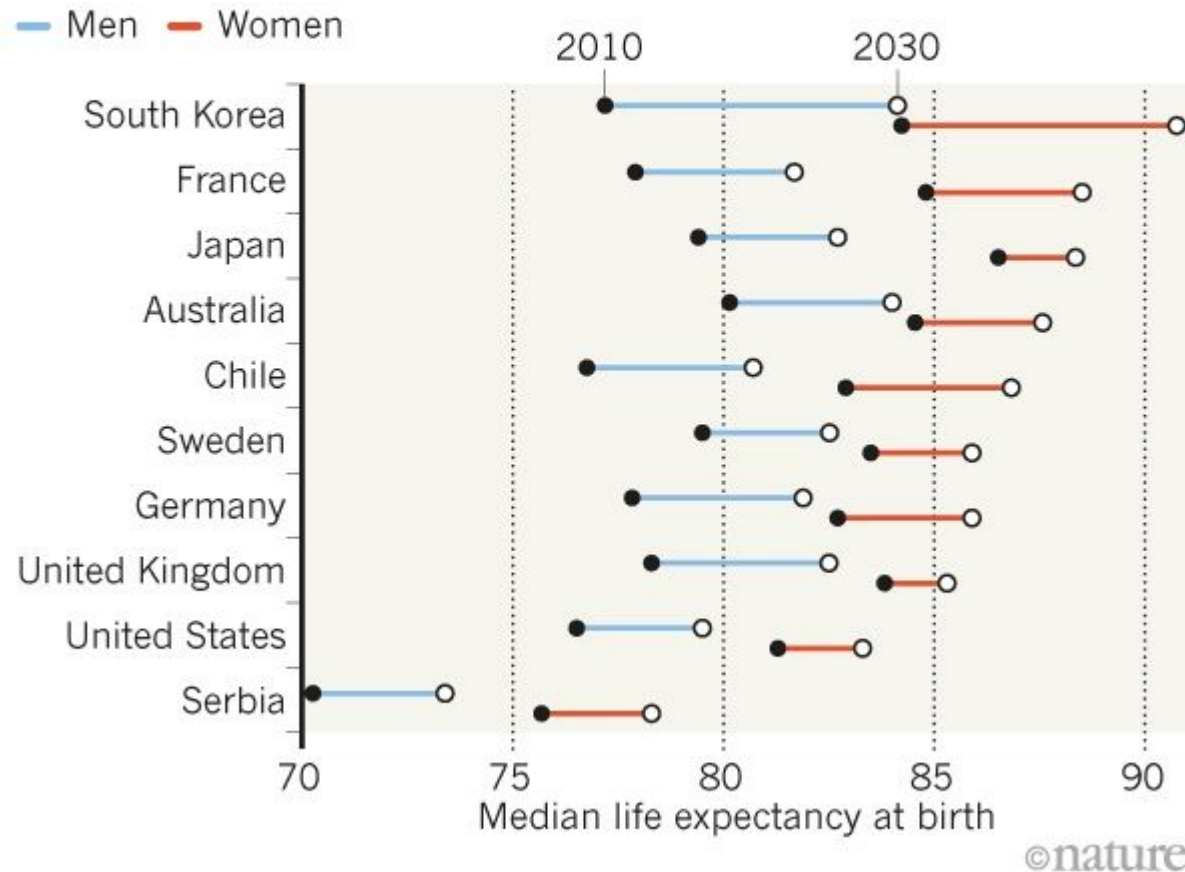
(Unit: The ratio of age groups to total population in percent)

Aged 0-14 Aged 15-64 Aged 65 and over



## AGEING POPULATIONS

By 2030, South Korean women are likely to have dethroned their Japanese counterparts as the world's longest living population.



Like Japan, South Korea is rapidly becoming a super-aged society.

The latest census statistics from the government show that the number of elderly people in Korea, defined as those aged over 65, hit 6.8 million in 2016, comprising 13.6% of its total population. The number of young people, or those aged up to 14, amounted to 6.8 million.

With over-65s on the verge of making up 14% of the population, Korea is on the cusp of becoming an “aged society” — a threshold that it reached much quicker than other developed countries. According to the National Statistics Office, it took Japan 24 years to go from an “ageing society” (defined as seniors making up 7% of the population) to an aged one — the number of over-65s stood at 34.6 million in Japan, or more than 27% of its population, according to figures released in 2016. It took Germany 40 years and France 115 years to make the same transition. Korea became an ageing society just 17 years ago. The government expects Korea’s population to peak in 2031.



There are approximately half a million over-65s at nursing homes and assisted living facilities in South Korea.

Work is underway on a system of caregiving that would enable elderly Koreans to spend their healthy years in their homes instead of in nursing homes and assisted living facilities.

There are a number of serious social issues related to this. Nursing homes often provide an excuse for hiding old people out of sight; the cost of elderly care has been spiraling; and older people prefer to spend their twilight years in their homes, even if their mobility is impaired.

South Korea's Ministry of Health and Welfare (MOHW) responded by announcing that it will be laying the foundation for comprehensive community care to provide the elderly with residential, medical, nursing and care services in their homes and neighborhoods by 2025, shortly before Korea becomes a super-aged society. Starting next June, 12 local government bodies will be taking the first step by launching two-year trial programs.

Community care refers to a social service policy of providing support so that the elderly and those with disabilities can enjoy services customized to their individual needs without leaving their homes and to be a part of their communities. Such services are provided by local governments in countries such as the UK and Japan.

The Health Ministry is working on the outline of basic legislation for comprehensive community care, which it hopes to submit in 2022, after experimenting with a variety of models for community care through these trial programs. It will also be submitting plans for other kinds of community care, first for children and later for people with disabilities, in the first half of next year.





## Community care plan



**Housing for elderly couples**  
renovating houses



**Total care residences**  
Food delivery,  
convalescent services,  
daily living support



**Communal residences**  
Convalescent and  
nursing services,  
transportation support



**Residences for elderly living alone**  
Food delivery and check-ups  
on general wellbeing



Convalescent facilities



Convalescent hospitals  
chronic illnesses



Acute care hospitals  
acute illnesses





## **Expanding residential infrastructure tailored to the elderly**

The government is planning to greatly expand the residential infrastructure that is tailored to the elderly. Between now and 2022, it will be building 40,000 additional units of public rental housing customized for the elderly that are in close proximity to facilities that provide health care and other care services. These housing units will be equipped with motion sensors and apparatus to automatically shut off the gas. The government will also be increasing the links between 140,000 permanent rental apartments, which house many elderly individuals, and social welfare centers.

A project will also be launched to provide home repairs for 270,000 households. This project will involve installing slip-resistant flooring and safety railing in bathrooms in the homes of the elderly, who have trouble using the bathroom and taking baths. Last year, the medical cost of treating fractures caused by elderly people falling down amounted to 1.3 trillion won (US\$1.15 billion).

This year a service will be launched to send doctors on house calls. At the moment, a health visitation service that sends nurses to check on old people's chronic diseases and lifestyles is only being provided to 1.1 million households (1.25 individuals), most of them in the low-income bracket. The government is planning to expand this program more than threefold by 2025, to 3.46 million households (around 3.9 million individuals).

The service will be available to elderly individuals who have been released from long hospital stays and to those who live alone. One variable here is pushback from the Korean Medical Association, which has been demanding a guarantee of appropriate compensation. By 2022, "resident health centers" will also be built in all cities, counties and districts and social welfare teams installed in "local connection offices" at 2,000 hospitals to connect discharged patients with caregiving services in the area.



In 2010, the World Health Organization (WHO) created the WHO Global Network of Age-Friendly Cities and Communities, a global network of cities that are committed to using the WHO guidelines to make their community more age-friendly. For the last seven years, the Network has grown to include 380 cities in 37 countries.

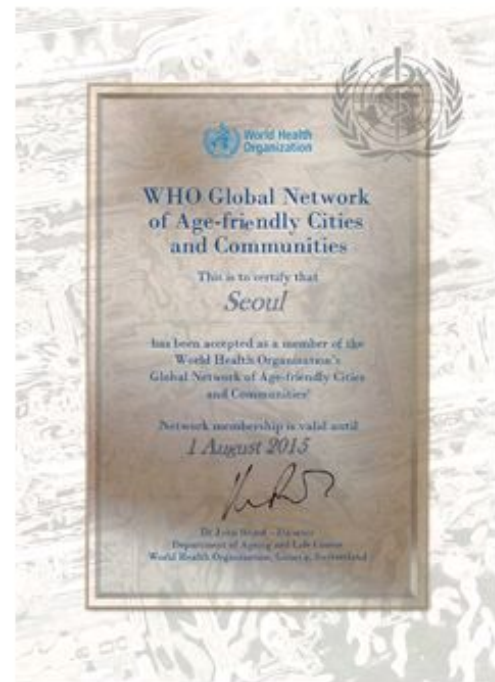
Since then the Seoul city government has consistently made efforts to respond to the needs of the aged.

In 2013 the Seoul Metropolitan Government established the 2020 Ageing Society Master Plan, which sets 'the realization of an age-friendly city' as its main policy goal, under the vision of a "healthy and lively city of citizens over

age 100", and this was the first time that the concept of age-friendliness was mentioned in any plan. Under this goal.

Seoul has begun to lay the basic foundations for promoting itself as an age-friendly city, enacting and announcing the "Basic Senior Welfare Act for an Age-friendly Seoul City" and creating a public-private partnership committee in 2011.

On the basis of opinions collected from citizens, Seoul also established and announced the "Seoul Comprehensive Plans(for seniors citizens)" as the 1st Action plan to realize an age-friendly city for senior citizens in 2012. As these efforts were recognized by the WHO, Seoul Metropolitan City became the 139th GNAFCC member city in June 2013, as well as being the second city with a population of 10 million, and the first Korean city, to join.



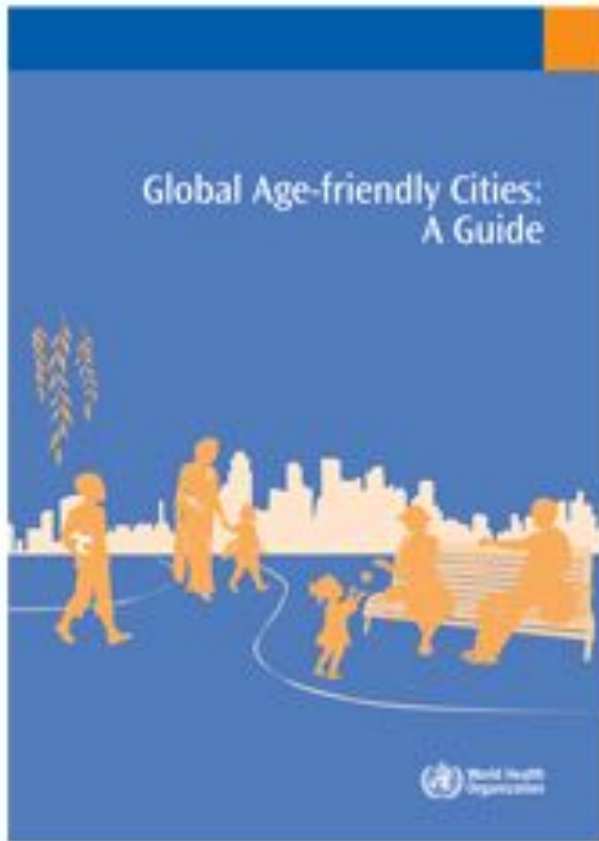
In 2014 the city organized a monitoring team jointly with the Seoul Welfare Foundation and Seoul Association of Social Welfare Centers to gather opinions and suggestions to improve services provided by the city.

The senior citizen monitoring group is a project designed to reflect the ideal of the **GNAFCC**, emphasizing direct participation by senior citizens, and has been operating every year since its initiation in 2012. The senior citizen monitoring group includes senior citizens aged over 65, as well as younger generation and baby boomers in their 50s, and conducts various research and debate activities. The senior citizen monitoring group conducts direct research and debate on diverse agendas covering main issues related to senior citizens in Seoul, and carries out projects for the construction of an age-friendly city. On the basis of these outcomes, the senior citizen monitoring group is constantly proposing tasks for senior welfare necessary for the city of Seoul.









In 2017 the journal *Innovation in Ageing* conducted a series of interviews with stakeholders such as the public administrators of the age-friendly Korean cities of Seoul, Jeongseup, Suwon, and Busan, in order to find out whether it was mainly social, political, or cultural forces that have led cities in South Korea to join the WHO Network of Age-Friendly cities.

The primary findings were that:

- Political motivation was the most influential force behind their development.
- The driving force behind the political motivations took several forms, from election year platforms to a new local government department needing to find work projects for itself.
- Degree of municipal autonomy was a factor. Implementation patterns showed great variability between the metropolitan cities and the self-governing cities. This study contributes to closing the knowledge gap in age-friendly initiatives in Asia, and future research needs to compare factors affecting the participation in the Network between countries within and across continents.





# Israel

***National Master Plan on Ageing,  
Strong Political Support for Elderly,  
Joint Geroscience Research  
Initiative with the UK***



# Summary of Relevant Government-Led Longevity Initiatives in Israel

- VETEK Association (an Israeli non-profit) developed a national Master Plan for Ageing and presented it to relevant legislative bodies in Israel in 2018, but the national development plan failed to be officially adopted.
- Through BIRAX Ageing, in the last year the Israeli government has taken a large first step towards recognizing ageing as a condition amenable to biomedical intervention. They have also taken progressive stances on a number of related and convergent areas, including preventive medicine and digital health.
- Although an excellent beginning, more is needed to cement longevity and healthspan extension as high-priority national agendas. Over the past several years, Israel has intensified its focus on the preventive and personalized treatment of ageing, and BIRAX Ageing is the culmination of these activities.
- The nation has all of the resources necessary to grow their academic geroscience landscape and their burgeoning longevity Industry into a full-fledged longevity-focused national agenda. The only missing element is a coordinated effort to unite these trends and resources into a coherent, synergetic national development plan.



- 1989 — **Long-Term Care Insurance Program (LTCIP) begins**  
The Long-Term Care Insurance Program (LTCIP) in Israel is a social security program administered by the National Insurance Institute (NII).
- 2006 — **Election of Mr. Rafi Eitan**  
Mr. Rafi Eitan established the Ministry for Senior Citizens specifically to address the problems and needs of the ageing population.
- July 2007 — **Ministry for Senior Citizens formed**  
A vote of approval by the Knesset on 25 July 2007.
- 2015 — **Ministry for Senior citizens becomes ministry for Social Equality**  
It becomes the main ministry for dealing with elderly welfare of all kinds.
- 2017 — **National Program for Long-term Nursing Care for the Elderly announced**
- 1 April 2018 — **National Master Plan on Ageing initiated**  
Developed by a topical Knesset committee under the leadership of Member of Knesset Tali Ploskov, as a joint effort of the Knesset committees on Health, Labor and Welfare.
- Sept 2018 — **Birax 4-day conference**  
BIRAX Ageing was the hosting of the conference that brought together 80 leading Israeli scientists with British peers to discuss the problem of demographic ageing, and what possible solutions could be brought to bear upon it.



המשרד לשוויון חברתי  
MINISTRY FOR SOCIAL EQUALITY

BIRAX Ageing







Life Expectancy	Both sexes life expectancy (2019)	81.8 years
	Male life expectancy (2018)	80.3 years
	Female life expectancy (2018)	84.2 years
GDP	GDP per capita, current prices (2018)	42.14 thousand (\$)
	GDP per capita, PPP (2018)	36.16 thousand (\$)
	GDP, current prices (2018)	381.57 billion (\$)
Population Ageing	Rate of population ageing	1.9 (2007-2017)
	Aged over 65 (2018)	11.7%
	Age dependency ratio (2017)	19%
Healthcare Efficiency	Health expenditure (2017)	7.4% of GDP
	Health expenditure per capita (2017)	2.834 thousand (\$)
	Healthcare efficiency score (2018)	67.0
Retirement	Total # retired	1 022 251
	Retired people proportion	12%
	Normal retirement age (Man/Woman)	70 years/67 years
	Early retirement age (Man/Woman)	63.3 years/68.3 years

## Longevity Initiatives



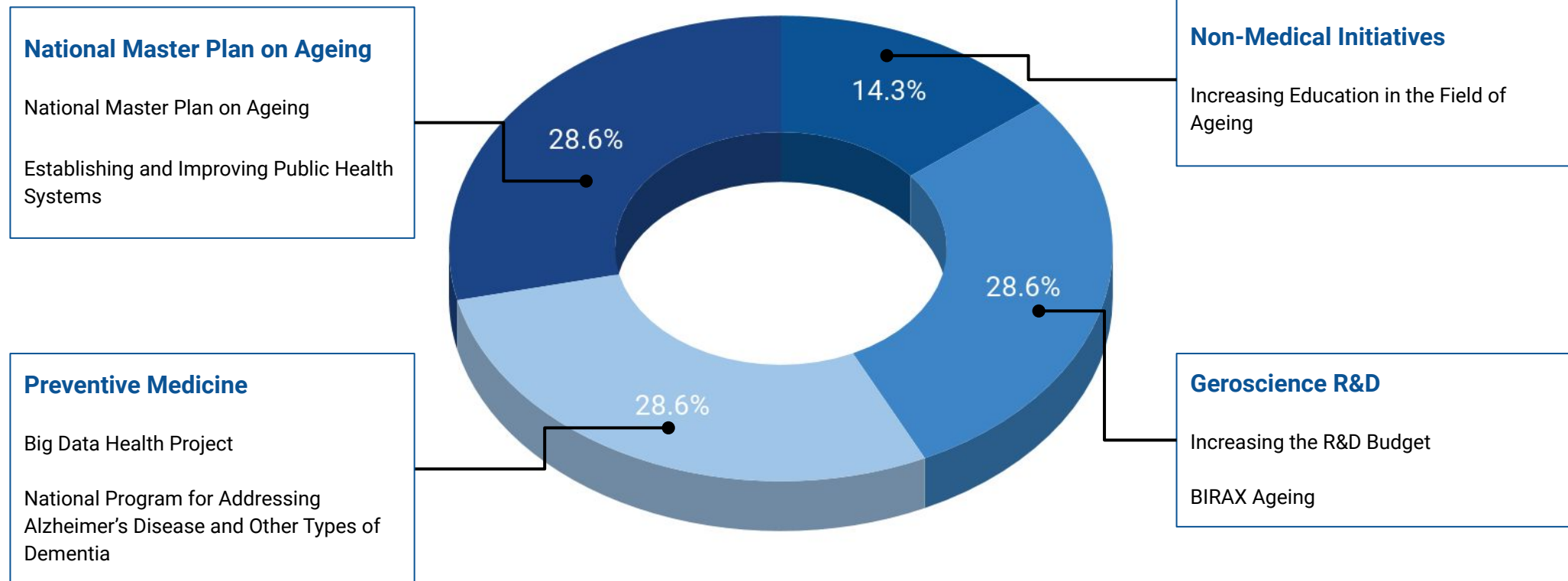
- Age of relevant initiatives: **30 years**
- **4** of WHO age-friendly cities and communities
- **2** initiatives focused on the non-medical improvement of quality of life
- **2** initiatives focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



# Israel Initiatives Level of Comprehensiveness



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## Underrepresented Initiatives

Healthy Ageing: Lifestyle and Fitness Programs	AgeTech	Longevity Industrial Strategy	Elderly Healthcare Vouchers	Financial Reform	Continuing Education
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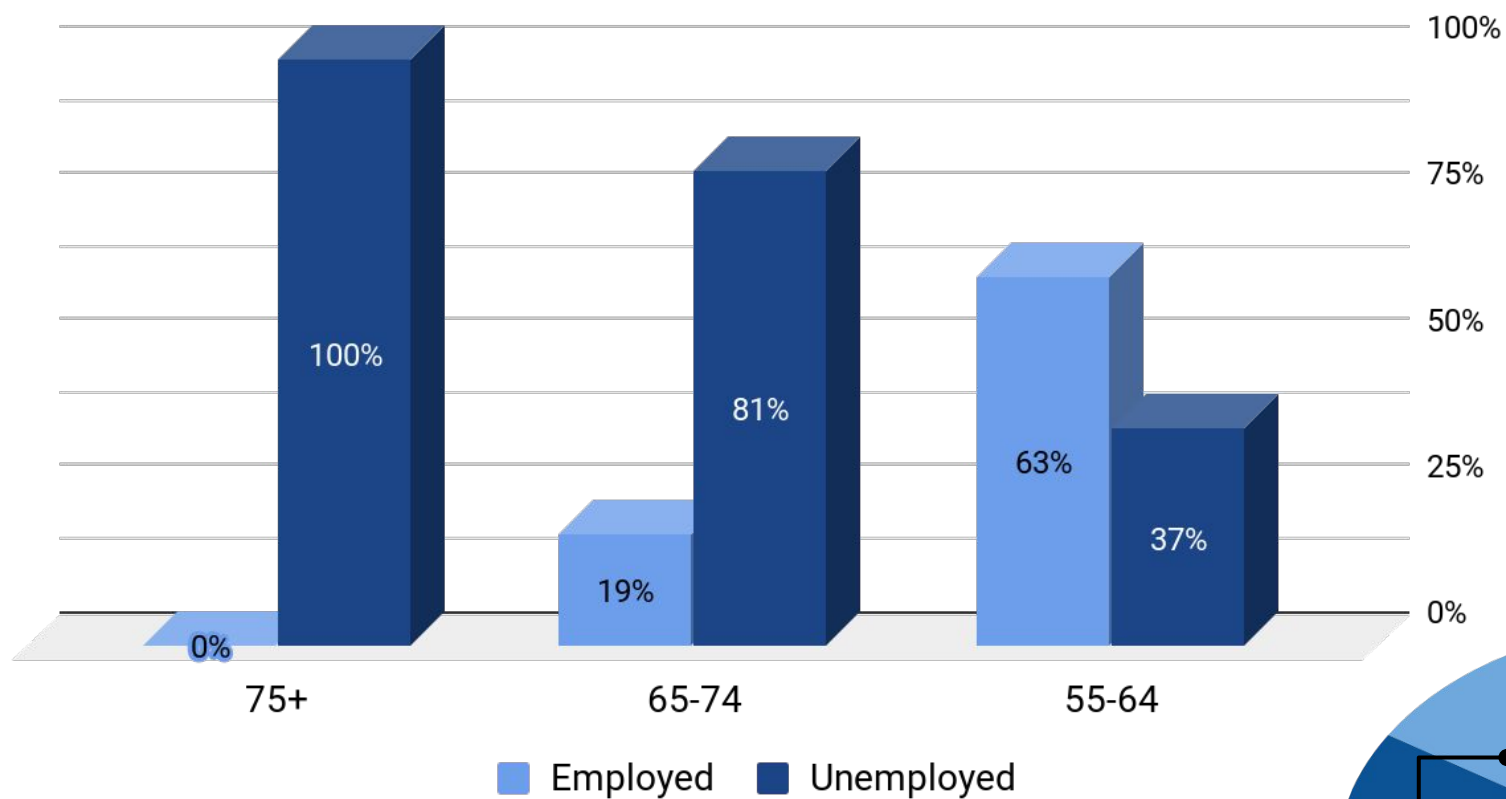


# Israel Age/Employment Range



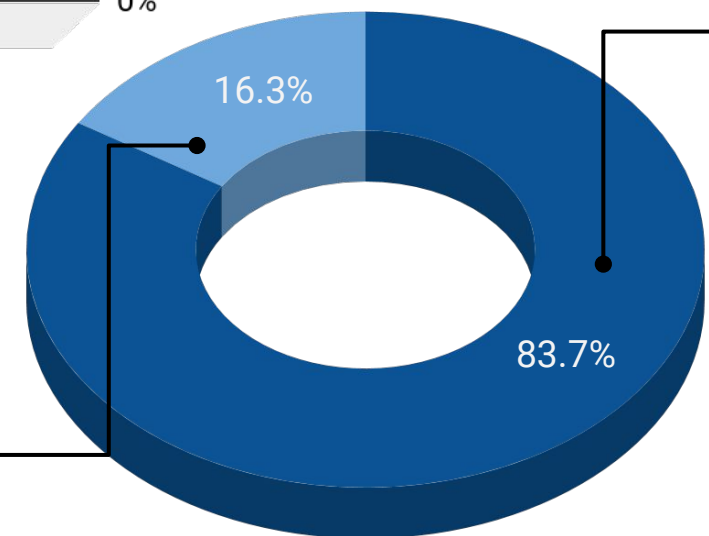
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## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60







Today, there are about 980,000 people in Israel over the age 65 (about 11% of the country's population), and it is expected that the number of elderly will increase to 1.6 million by 2035. This reality demands the preparedness of the healthcare and welfare system to provide worthy and sufficient services for the elderly, adequate solutions for the prevention of systemic economic collapse, as well as for the equitable social inclusion of the elderly, and as a result the improvement of their quality of life and the country's economic growth. Presently, the level of preparedness for the ageing population problem is still inadequate.

The national expenditure, both private and public, for the long-term nursing care of the elderly in Israel are about NIS 14.5 billion (~\$ 4 billion) yearly, which comprises 1.2% of the entire gross domestic product, and are expected to grow by over 300% by 2059.

Presently, the level of scientific knowledge and technological capabilities are not sufficient to provide comprehensive solutions for severe chronic ageing-related diseases.

Research and development must therefore be intensified and accelerated in order to improve those capabilities. The research and development are needed in order to create novel therapeutic means based on a deeper fundamental understanding of ageing processes, as well as to optimize and implement the means that are already ostensibly known, such as existing therapeutic means and healthy lifestyle (nutrition, physical activity, etc.).

Nonetheless, the State of Israel expends only about 0.5% of its general research budget for the research of ageing and ageing-related diseases. It is imperative to establish priorities for the support of the field.



An increasing number of governments are releasing policies and initiatives that recognize demographic ageing as a pressing modern social and socioeconomic concern.

But BIRAX Ageing may be the first such government initiative that explicitly aims to treat ageing directly, as the underlying cause of age-related disease, and as such demonstrates the progressive stance that both the British and Israeli governments have taken in response to the socioeconomic challenges posed by demographic ageing.

The BIRAX group consists of over 1000 scientists from 120 institutions, including four Nobel Prize winners and three members of the UK House of Lords.

In addition to BIRAX's founding partners, BIRAX Ageing is also supported by a host of other prominent UK foundations and charities, including the **British Heart Foundation, JDRF, Parkinson's UK, MS Society, Alzheimer's Society, Weizmann UK, Clore Foundation, the Wolfson Foundation** and the **Ministry of Science, Technology and Space** in Israel, **Diabetes UK, Arthritis Research UK, Dementia Discovery Fund, the Rosetrees Trust, Brightfocus Foundation** and **Dunhill Medical Trust**.

One of the first acts of BIRAX Ageing was the hosting of a 4-day conference in September 2018 that brought together 80 leading Israeli scientists with British peers to discuss the problem of demographic ageing, and what possible solutions could be brought to bear upon it. The conference was held at King's College London, and featured representatives of the British Embassy in Tel Aviv, Lord Winston, and senior dons from Oxford and Cambridge.

Remarking on the importance of the meeting, David Quarrey, British Ambassador to Israel, stated that *"This week saw a fantastic exchange of ideas between top researchers from both countries. Partnership between the UK and Israel can help us address one of the biggest challenges facing all societies – that is, ageing societies. Working together we can improve many people's lives."*

Speaking at the event, UK Science Minister Sam Gyimah said that *"The BIRAX Ageing program will bring together our brightest and best scientists, researchers and entrepreneurs to help with one of our greatest challenges – the ageing populations. We are living longer than ever before. In fact, the UK government's Industrial Strategy highlights that one in three children born in the UK today can expect to live to 100. While our ageing population poses new demands, it also comes with new opportunities to develop new treatments, enhance existing ones and diagnose diseases more quickly."*



National & International BIRAX Ageing Sponsors & Partners



UK Science Minister Sam Gyimah Announcing The Launch of BIRAX Ageing



Ageing is increasingly recognized in Israel as an important national challenge, including the recognition of the need to develop specific policies to prepare for and address the ageing challenge.

Following the significant electoral gains of the Israel Pensioners Party **Gil** in the election of 2006 under the leadership of Mr. Rafi Eitan, in 2007 there was established the **Ministry for Senior Citizens** specifically to address the problems and needs of the ageing population. Yet, in 2015 the ministry became the **Ministry for Social Equality**, and the relative proportion of involvement with the ageing challenge diminished.

In recent years, several policy initiatives have sought to address particular areas of the ageing challenge, such as *the National Program for Long-term Nursing Care for the Elderly* of 2017. Yet, perhaps the first truly comprehensive and far-reaching policy program to improve the preparedness of the Israeli society for the ageing population problem, including all of its aspects, is the **National Master Plan on Ageing** initiated in 2018, and developed by a topical Knesset committee under the leadership of Member of Knesset Tali Ploskov, as a joint effort of the Knesset committees on Health, Labor and Welfare.

The Master Plan generally considers the improvement of well-being of the elderly in Israel, addressing such problems as: poverty, employment and retirement, nursing in community and institutions, family caregivers, loneliness, inter-departmental coordination, abuse and neglect, independency, healthcare services, welfare services, pensions and allocations, public housing, and technologies.



***Member of Knesset Tali Ploskov leads committee on the National Master Plan on Ageing.***

Currently, government responsibility for services to the elderly are split between ministries. Two ministries – one for social welfare, the other for social equality – deal with elderly welfare, while the Health Ministry is responsible for old-age homes and the Finance Ministry incorporates the Holocaust Survivors' Rights Authority. In addition, the National Insurance Institute deals with nursing care and financial benefits.

The National Master Plan on Ageing recommends a stronger coordination and pooling of resources among the relevant ministries for the benefit of the ageing population. During the program preparation, there was a recognition of the critical need to support biomedical research and development for the amelioration of degenerative ageing process and ageing-related diseases and extension of healthy longevity. For this purpose, two special hearings were held in Knesset by the masterplan preparation committee on the *"Research, development and education for the promotion of healthy longevity and prevention of ageing-related diseases"*.

Specific **draft recommendations** have been suggested specifically to enhance *"Research, Development and Education for the Promotion of Healthy Longevity and Prevention of Ageing-related Diseases"* as a part of the National Masterplan on Ageing, and were discussed at a special Knesset Committee hearing dedicated to the subject, on December 24, 2018.

Though not included in the committee report, the recommendations will be further promoted following the next general election in Israel in April 2019.







# Recommendations for the Promotion of Healthy Longevity and Prevention of Ageing-Related Diseases

**1. Increasing the R&D budget for the field** – A significant increase in the level of governmental and non-governmental funding must be ensured for basic, applied, translational and clinical research and technological development for the prevention of degenerative ageing processes, ageing-related chronic non-communicable diseases and disabilities, in order to extend the healthy and productive life expectancy for the entire population throughout the entire life course. Specifically, a defined significant percentage of the research and development budgets of the relevant ministries must be dedicated to the field. These include the Ministry of Health; the Ministry of Science, Technology and Space; the Planning and Budgeting Committee of the Council for Higher Education; the Israel Innovation Authority; the Israel Science Foundation; the Israel Academy of Sciences and Humanities including the National Infrastructure Forum for Research and Development; the Ministry for Social Equality; the National Insurance Institute; the bi-national and international research programs in which Israel is a partner, particularly in the divisions concerning the research and treatment of non-communicable chronic diseases.

**Explanation** – Except for the budget framework for science, technology and innovation for the older persons within the Ministry of Science, Technology and Space, there are no other defined budget frameworks in Israel for research and development in the field of ageing, healthy longevity and prevention of ageing-related diseases. There are limited support frameworks that can be adapted to the subject, such as research budgets for specific diseases, such as Alzheimer's disease, diabetes, cancer, etc., which by their nature are ageing-related diseases. But in fact, there are no dedicated support frameworks specifically addressing ageing-related ill health as a whole (old-age multimorbidity), neither addressing ageing as the primary risk factor for age-related diseases, and there is almost no reference to the special medical needs and characteristics of the ageing individuals and the older population. Their characteristics and medical needs are often dramatically different in terms of diagnosis and treatment from the younger population, and the difference may have a decisive impact on the effectiveness of treatment. There is also a lack of centralized R&D support frameworks for the field of ageing in Israel, such as the NIH's National Institute on Ageing that exists in the US. Therefore, budget frameworks must be established for medical research and development that will specifically address the issue of ageing, and promote healthy longevity and prevention of ageing-related diseases. These frameworks will provide calls for research proposals, grants, scholarships, services and action plans designed to alleviate the degenerative ageing process and improve the longevity and quality of life of the older population, on behalf and in cooperation of the relevant ministries.





# Strong Need to Encourage Governmental and Private Investments into Biomedical R&D Programs for Healthy Longevity

FUNDING BODY	GENERAL RESEARCH FUNDING - MILLIONS NIS	EXISTING FUNDING FOR AGEING RESEARCH - MILLIONS NIS
Ministry of Science. Allocations for research centers, researches and stipends	150	15 in 2015,2016 6.5 in 2018
Israel Science Foundation	500	2
National Innovation Authority. Ministry of Economy	1500	0
Ministry of Health. Research fund	10	0
The Council for Higher Education in Israel. Research programs apart from ISF	350	0
National Insurance Institute. Research fund	180	0
Israel Academy of Sciences("miscellaneous" in the Council for Higher Education in Israel)	10	0
Ministry for Social Justice (former Ministry for Senior Citizens)	0	0
<b>Total</b>	<b>2700</b>	<b>17 - 0.63%</b>



# Recommendations for the Promotion of Healthy Longevity and Prevention of Ageing-Related Diseases

**2. Increasing education in the field** – Academic and public education frameworks and programs must be created and expanded considering the basic and applied research on ageing processes and ageing-related diseases, promoting healthy longevity, preventing ageing-related diseases and improving the quality of life for the elderly, including biological, medical, technological, environmental and social aspects.

**Explanation** – Due to the severe deficit of educational material in the field in Israel, educational teaching and training material should be developed and disseminated for people at all education levels, both for the academia and the general public, for all age groups, for different sectors and in different languages, in accordance with their specific abilities and characteristics. Teaching programs that increase motivation and stimulate scientific thinking in the field should be developed for children, university students at different study stages (undergraduate and graduate), for interns and specialists, and as a part of adult enrichment studies. In particular, it is necessary to develop study materials, such as courses and professional specialization programs in the biology of ageing (biogerontology), especially for physicians and biologists in the fields adjacent to ageing research, as well as educational materials for the general public.

The materials for the general public should include lectures, reviews of the latest scientific developments in the field and practical recommendations for the promotion of healthy longevity and for the preparation of the younger generation to the challenges that expect them. There must be prepared and disseminated authoritative, evidence-based information about lifestyle regimens (such as nutrition and physical activity) that promote healthy longevity and prevent ageing-related ill health. A variety of educational teaching and training means should be developed, including conferences, printed materials, interactive web platforms and other accessible technological means. Relevant ministries and institutions should be involved in the development of and providing access to these educational programs, from the Ministry of Education and the Council for Higher Education to local authorities, third sector organizations, and community centers. In order to facilitate the progress, there is a need to encourage the establishment of educational pilots and the examination of good practices in relevant ministries and other frameworks.

**3. Establishing and improving public health systems for the early detection and prevention of ageing-related diseases** – Evidence-based measures and indicators must be developed and applied to estimate the effects of ageing, predict and detect at an early stage multiple ageing-related diseases, and examine the effectiveness of therapeutic and preventive interventions against them. Concomitantly, measures and indicators must be advanced for the functional and employment capacity of the elderly and for the improvement of their functional capacity.

**Explanation** – In order to develop and implement improved measures for assessing the ageing process, for the early diagnosis and prediction of multiple ageing-related diseases, for examining the effectiveness of treatments for their prevention and for estimating and improving the older persons' functional and employment abilities, it is necessary to increase and improve the collection and processing of various types of data on ageing, including biological and medical data in combination with behavioral and social, economic and environmental data. In this process, it is necessary to establish and/or expand relevant databases (registries) and analytical platforms and tools (knowledge centers) in order to facilitate the collection, design, accessibility, analysis, integration and sharing of data on ageing, promotion of healthy longevity and prevention of ageing-related diseases. These databases and analytical tools should be used predictively to model large amounts of data for more effective diagnosis and treatment and to allow personalized medicine for the older subjects, with reference to their ageing process. In order to establish and expand these measurement and analysis systems, it is necessary to involve the relevant ministries and institutions, in particular the Ministry of Health, with the maximum possible cooperation of other entities who have access to data on ageing, such as research institutions, hospitals, health management organizations, local authorities and public and commercial research communities.

The goals of evaluating the ageing processes, early detection and prevention of ageing-related ill health as a whole (preventing old-age multimorbidity) and extension of healthy lifespan, should be specifically defined in relevant frameworks and programs, such as the National Program for Personalized Medicine and the National Program for Digital Health as well as relevant international health promotion programs where Israel takes part. Initiatives and pilots of different extents on the subject should be encouraged in all sectors, while supporting their cooperation.





# Switzerland

*Strong Bioscience Initiative,  
Diverse Policies for the Elderly  
in a Small Geographical Area,  
Strong Focus on FinTech for the Elderly*

- Adopted the Global Strategy and Action Plan on Ageing and Health by the 69th World Health Assembly in Geneva in May 2016, and co-sponsored its long-term strategies for what Swiss Ambassador for Global Health, Tania Dussey-Cavassini described as "multisectoral action" to "develop age-friendly environments and to transform our understanding of ageing and health."
- Home of the Swiss Personalised Health Network, set up by the State Secretariat for Education, Research and Innovation and the Federal Office of Public Health. It is intended to be designed to develop personalised medicine in Switzerland. It integrates health data from many electronic sources, and its initial task is to sort out data interoperability between local and regional information systems, especially clinical data management systems. The ethical, legal and social implications of personalized medicine are among its first tasks.
- Unique multi-tier welfare system.
- Decentralised healthcare system.
- Government Masterplan for the Promotion of Biomedical Research: impacts research and development, clinical research.





2010	<b>National Platform for Palliative Care Strategy</b> The Confederation and cantons have promoted palliative care in Switzerland in a national strategy.
2012	<b>Elderly Care Bank established</b> St Gallen the first Swiss city to introduce a novel banking scheme in which retired care volunteers “deposit” hours worked looking after elderly people.
2013	<b>Masterplan for the Promotion of Biomedical Research</b> The plan impacts the entire chain, from research and development, clinical research, market entry for biomedical products, and pricing and reimbursement by social security, all the way to the availability of these products in day-to-day healthcare.
2014	<b>Retirement 2020</b> Swiss government advocates that “living longer means working longer”.
2016	<b>Roadmap 2016–2021</b> For developing the next generation of clinical researchers
2017	<b>2017 Swiss Personalized Health Network (SPHN) established.</b>
2018	<b>Masterplan for the Promotion of Biomedical Research renewed</b>
2018	<b>The VIA project launched</b> The overall goal of the VIA project is to promote the health of older people and to strengthen their self-determination and independence in order to maintain or improve their quality of life and overall well-being, allowing them to continue living at home for as long as possible.

**SERI**





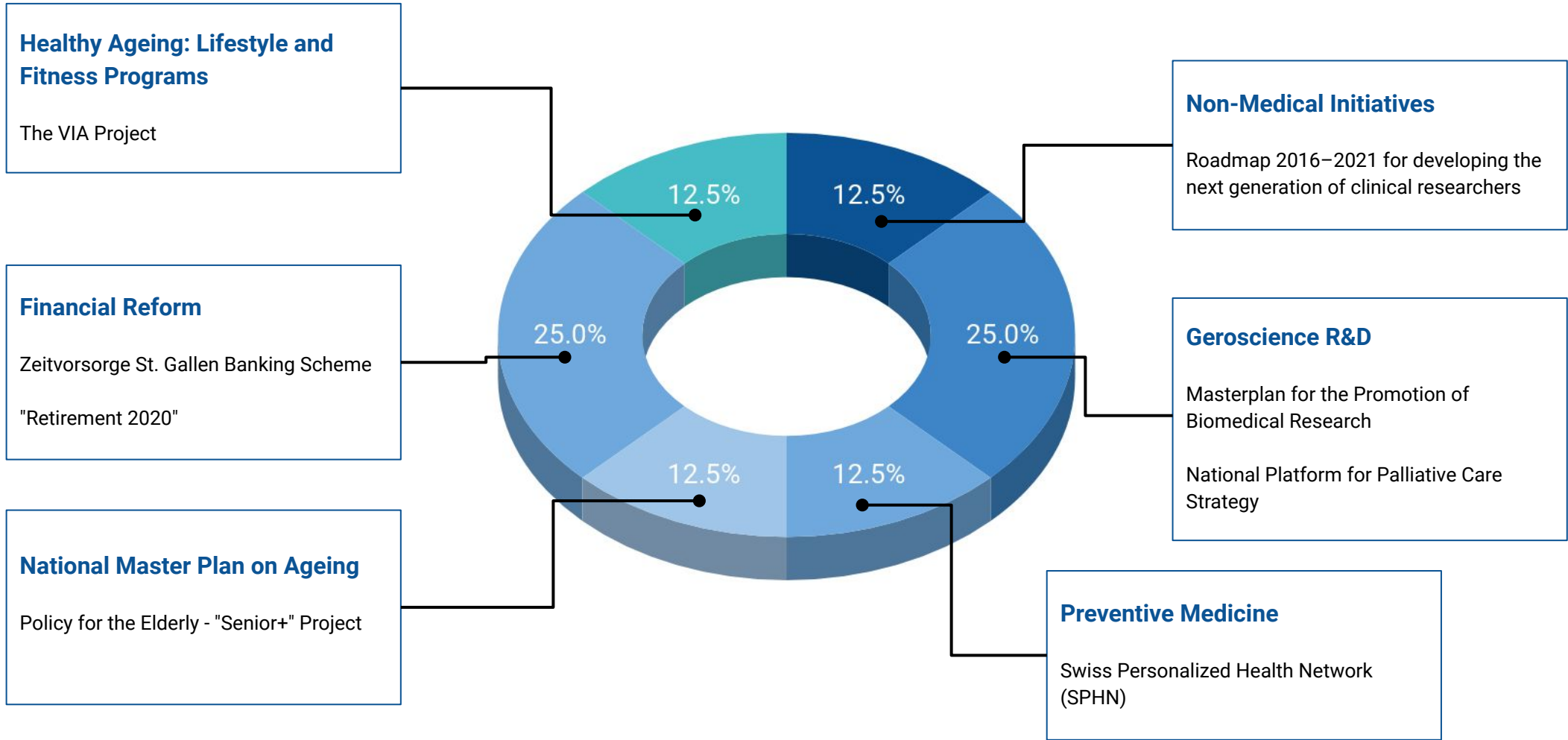
Life Expectancy	Both sexes life expectancy (2019)	81.8 years
	Male life expectancy (2018)	81.2 years
	Female life expectancy (2018)	85.2 years
GDP	GDP per capita, current prices (2018)	82.41 thousand (\$)
	GDP per capita, PPP (2018)	65.71 thousand (\$)
	GDP, current prices (2018)	707.54 billion (\$)
Population Ageing	Rate of population ageing	1.9 (2007-2017)
	Aged over 65 (2018)	18.34%
	Age dependency ratio (2017)	28%
Healthcare Efficiency	Health expenditure (2017)	12.3% of GDP
	Health expenditure per capita (2017)	8.009 thousand (\$)
	Healthcare efficiency score (2018)	58.4
Retirement	Total # retired	1 560 790
	Retired people proportion	18%
	Normal retirement age (Man/Woman)	65 years/ 64 years
	Early retirement age (Man/Woman)	63 years/ 61 years

## Longevity Initiatives

- Age of relevant initiatives: **15 years**
- **3** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing



# Switzerland Initiatives Level of Comprehensiveness

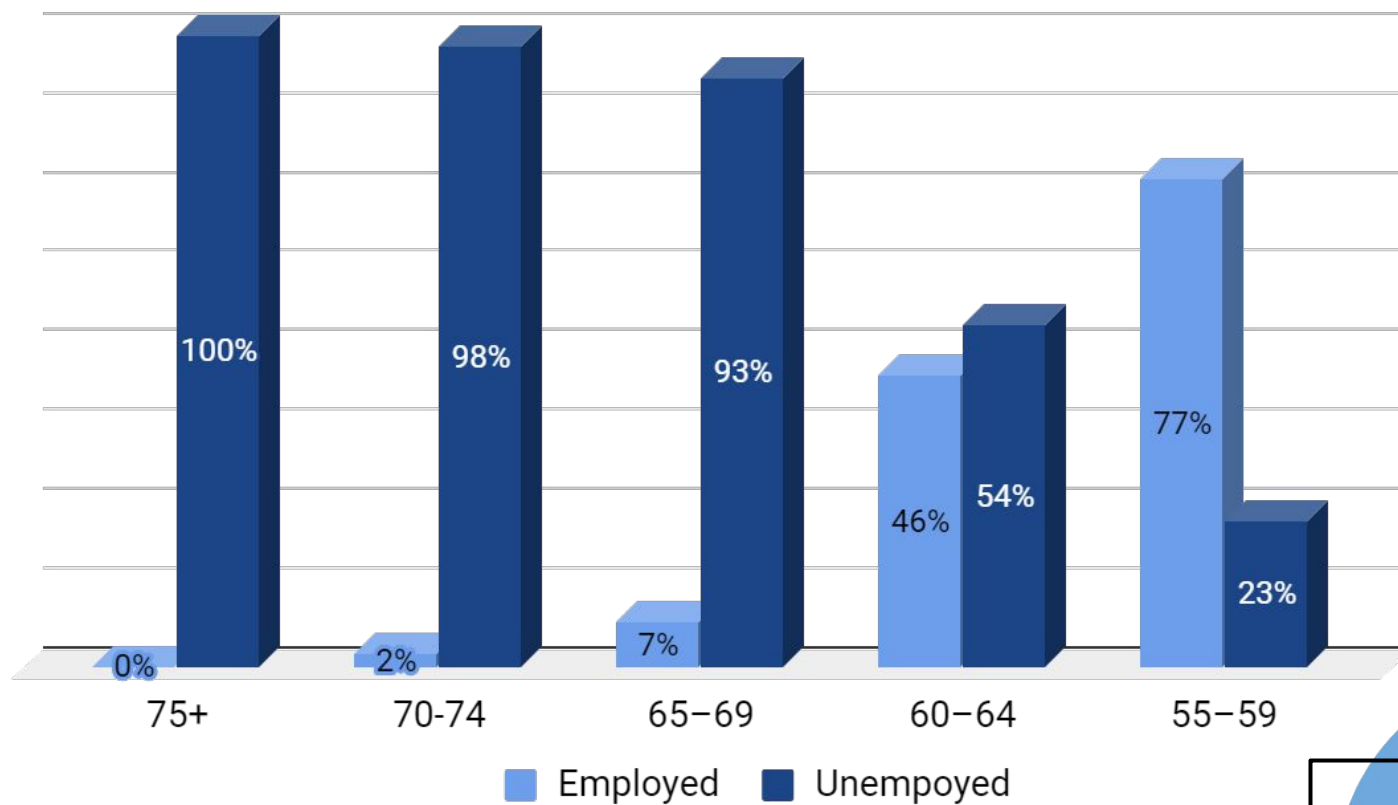


## Underrepresented Initiatives

AgeTech	Elderly Healthcare Vouchers	Longevity Industrial Strategy	Continuing Education
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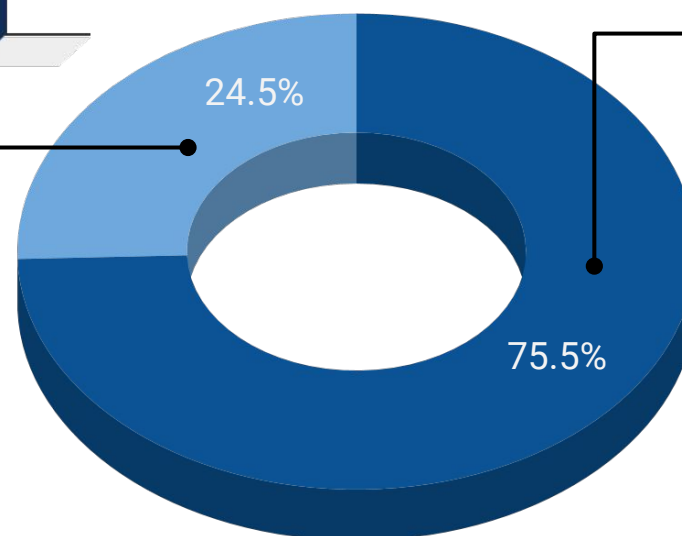


## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60

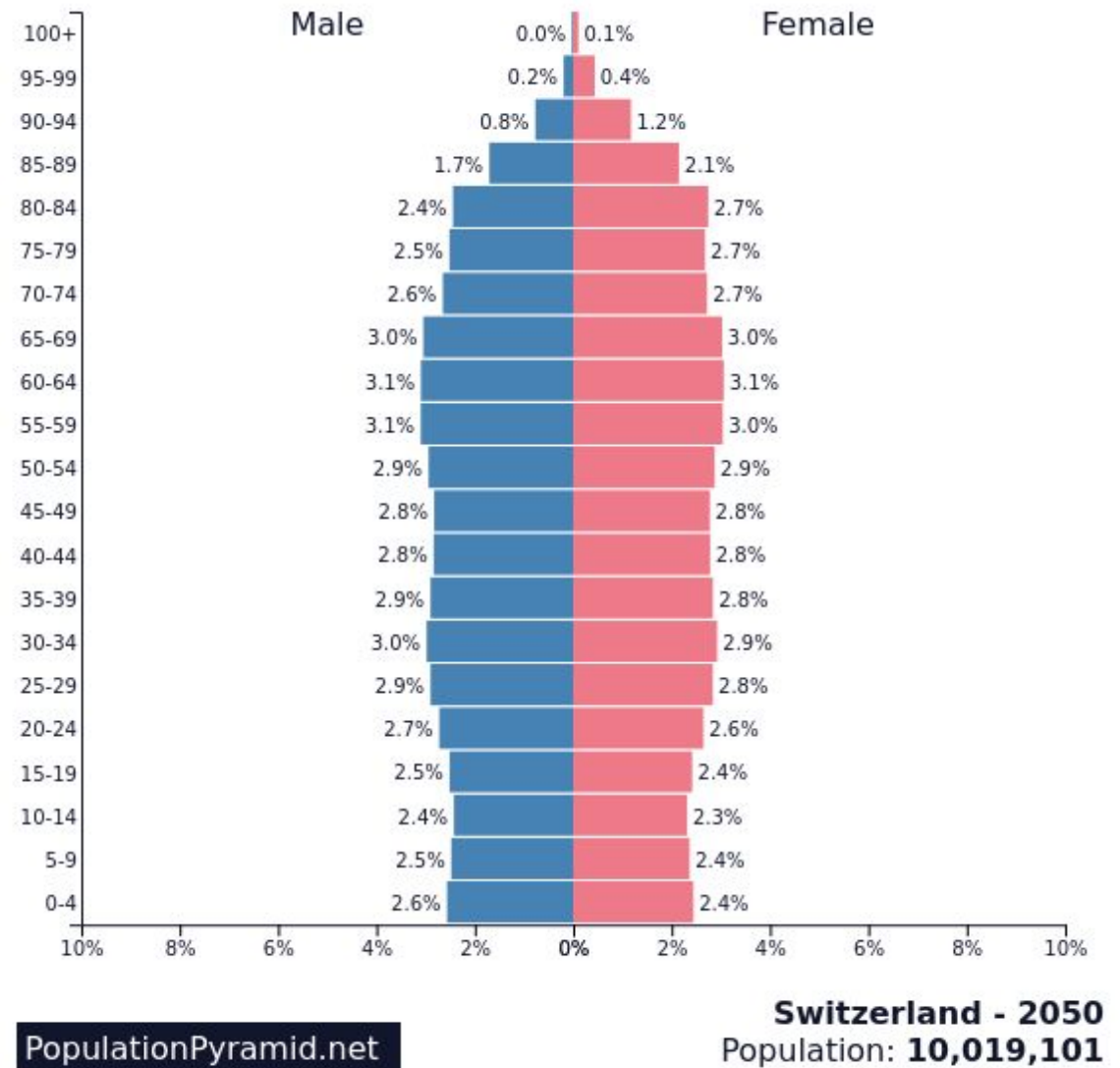


The Swiss population is one of the oldest on the planet. This is a consequence of low fertility, increased life expectancy (in 2018 Swiss life expectancy ranked 5th in the world, with an annual life expectancy of 83.489 years) and a societal appreciation for preventative health and healthy ageing.

An ageing population has two longevity-progressive benefits:

- It galvanises government action. The challenges of an ageing society make themselves felt at all levels, and this forces governments to confront the global 'silver tsunami' head on.
- Money and power are concentrated in the hands of the elderly, and more likely to be directed toward solutions which improve the lives of the elderly.

In these respects, and in others, Switzerland has become something of a *longevity-progressive nation*: A term defined in previous reports to describe a country which provides fertile ground for the Longevity Industry to take root.





Switzerland has more centenarians than any other European nation, thanks to high standards of living, health care and nutrition over the past 50 years. Researchers at Lausanne University said the country had the highest life expectancy in Europe.

Proportionally, Switzerland is thought to be second only to Japan with regard to the number of people who have reached 100. According to the study conducted by the Institute for Social and Preventive Medicine, about 40 out of every 10,000 people born in 1900 in Switzerland made it to their 100th birthday. Life expectancy has increased by 98 per cent for men and 96 per cent for women in the past century and a half. A slight dip was due to an influenza epidemic in 1918.

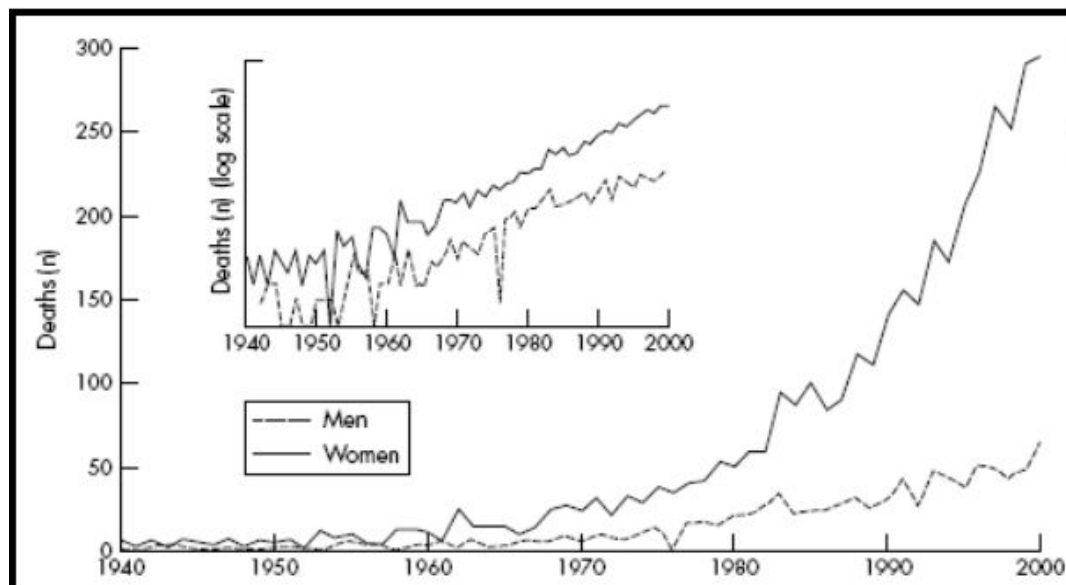
Swiss women live longer than men, clocking up an average of 83 years, whereas males can expect to make it to their 77th birthday. Factors that shortened male life spans included smoking and alcohol. High standards of living were the most important factor in ensuring longevity.

Another factor was that neutral Switzerland, unlike many other European countries, did not suffer major loss of life during the two world wars.

Most of the available studies are based on population census and vital statistics, i.e., on an information system available only since the mid-19th century in the developed countries. A substantial amount of information is provided by demographic history on the pre-modern patterns of mortality, including in Switzerland.

In Europe, there is a slow and steady increase of the life expectancy at birth since the Middle-Age, i.e., well before the sanitary and hygienic reforms of the late 19th century, possibly in relation with factors such as diet, infectious environment, etc. This raises the possibility that future changes in mortality might be determined by unexpected changes of currently unknown factors.

Life expectancy at birth has increased steadily in Switzerland since 1876, from about 40 and 42 years for men and women, respectively, to the current values of 79 and 84 years <sup>2</sup>. In other words, Life expectancy at birth almost doubled in both genders, with a yearly increase amounting to about 4 or 5 months from 1876 until 1950, slightly faster among women than among men. It then dropped off to a slower rhythm, about 3 months per year, during the period 1950-2000.



Number of deaths at age 100 and over, by gender, Switzerland, 1940- 2000  
(Source: Robine J-M, Paccaud F. 2005)





A small, intricately subdivided nation such as Switzerland means less bureaucracy, less political deadlock, and greater consensus at a national level. This makes national programs easier to develop and detailed visions easier to implement, a fact which makes possible Switzerland's unique multi-tier welfare system.

A related advantage here is the constitutional structure of Switzerland: both very small yet also very decentralised into administratively distinct 'cantons', in which services to the elderly are developed on a local basis, close to the needs of older people.

These two advantages combined could make Switzerland a rapid and efficient testing ground for political initiatives carried out for the benefit of its own population, with multiple permutations of each strategy visible to the federal government at once. But for now there is no overall monitoring or coordination mechanisms in place.

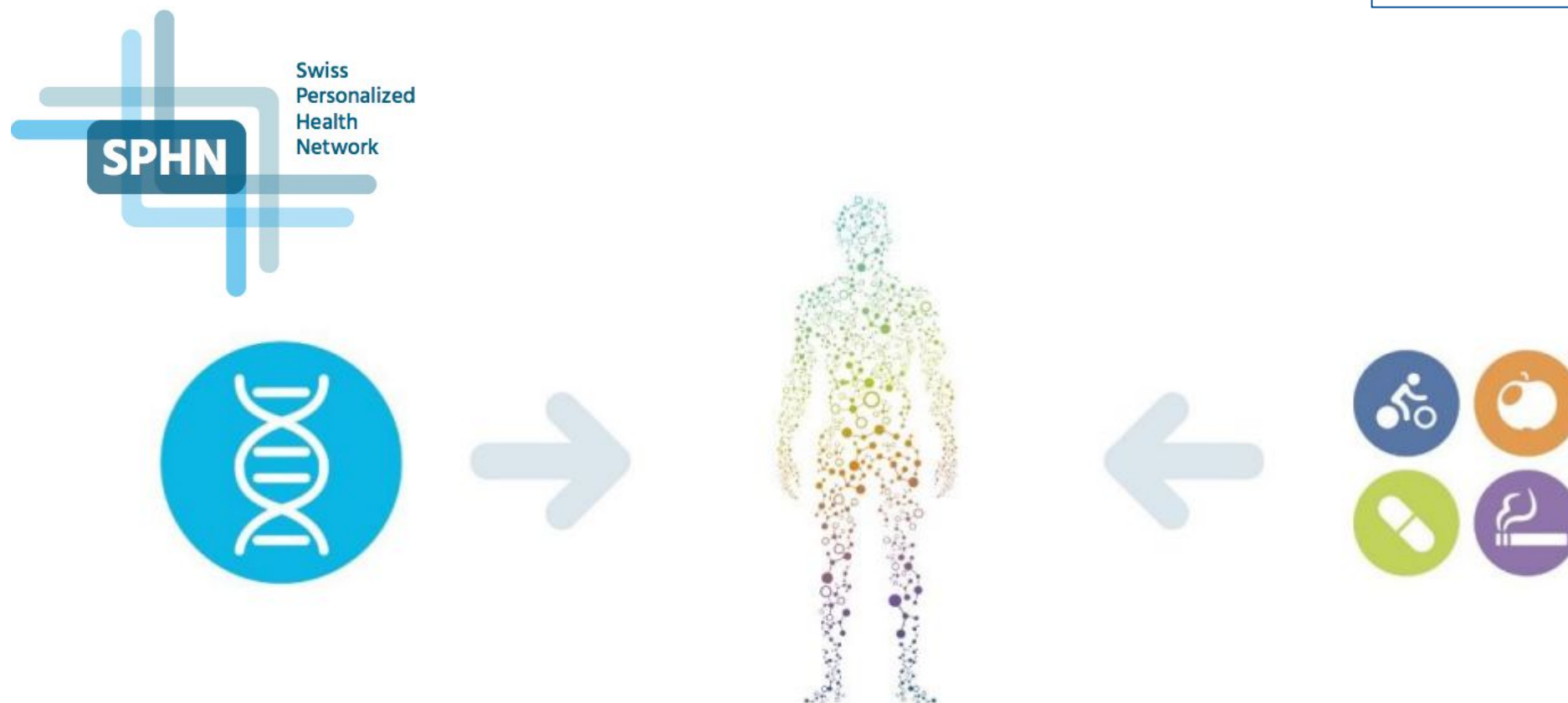
This has not prevented Switzerland from taking some political initiative on the world stage with regard to the global ageing population.

Switzerland supported the adoption of the Global Strategy and Action Plan on Ageing and Health by the 69th World Health Assembly in Geneva in May 2016, and co-sponsored its long-term strategies for what Swiss Ambassador for Global Health, Tania Dussey-Cavassini described as "multisectoral action" to "develop age-friendly environments and to transform our understanding of ageing and health. "





# Swiss Personalized Health Network (SPHN)



The main goal of the SPHN initiative is to bring Switzerland to the forefront of personalized health research by establishing nationwide interoperability of biomedical information. Data sharing must be the guiding principle.

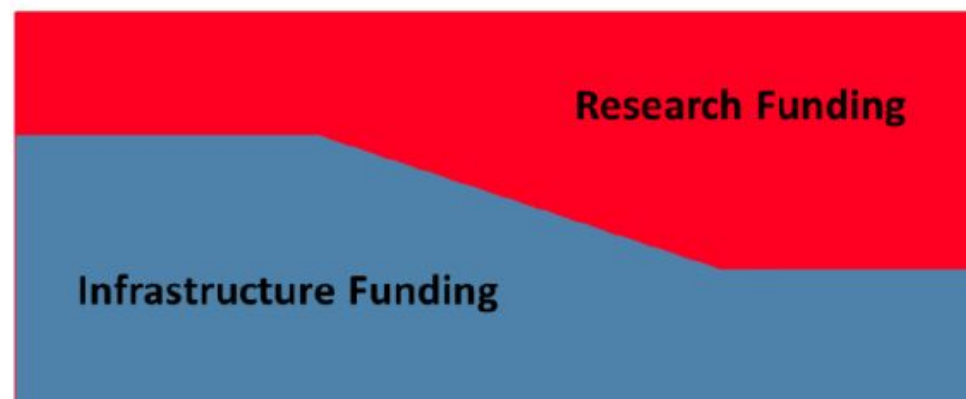


## Infrastructure Implementation Projects.

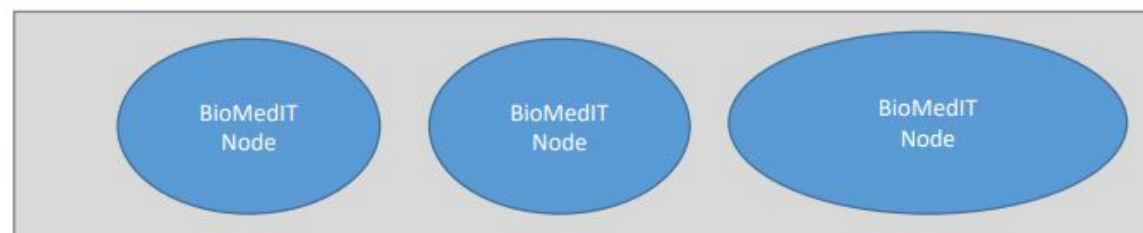
Data Management  
Infrastructure at Hospitals



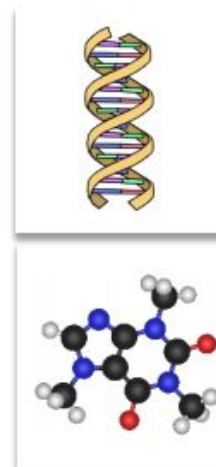
 SAMWASSM



Secure Research  
Environment (BioMedIT)



Universities



Strategic Focus Area  
**Personalized Health  
and Related Technologies**



Swiss Institute  
Bioinformatics

It is the job of the federal administration to maintain and develop as good a framework as possible for biomedical research and technology, and at the same time to enable people in Switzerland to physically benefit from the achievements of biomedicine and give them affordable access to the latest biomedical products. The FOPH plays a key role in this. It is responsible for the legal framework (for example in relation to human research, therapeutic products, cancer registers and e-patient dossiers), and is charged with ensuring that the healthcare system remains high-quality, effective and affordable. Besides the FOPH, efforts to promote biomedicine and biomedical research also involve units of other departments, including the following:



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

The State Secretariat for Education, Research and Innovation (SERI), part of the Federal Department of Economic Affairs, Education and Research (EAER) is the federal administration's centre of competence for the domestic and international aspects of education, research and innovation policy. The State Secretariat for Economic Affairs (SECO), also part of the EAER, is responsible for business and economic development across industries, encouraging foreign companies to locate to Switzerland. Swissmedic, the Swiss agency for the authorisation and supervision of therapeutic products, guarantees that only high-quality, safe and effective therapies are marketed in this country. The Swiss Federal Institute of Intellectual Property is the federal centre of competence for all matters related to patents, trademarks, indications of source, the protection of designs, and copyright.

In response to requests from parliament, in 2013 the Federal Council presented a package of measures designed to boost Switzerland as a centre of biomedical research and technology. The master plan contains more than 20 actions covering the promotion of research and innovation, market entry, health insurance reimbursements, rare (orphan) diseases and intellectual property. The Department of Biomedicine at the FOPH is responsible for coordinating the master plan. The Federal Council decided in December 2018 to continue the master plan.





The city of St Gallen in Switzerland has introduced a novel banking scheme in which retired care volunteers “deposit” hours worked looking after elderly people.

In return they can use any time saved up for their own care provision later in life. The St Gallen government hopes the pilot project will lower social service costs and encourage local solidarity as it copes with a steadily ageing population.

Under the proposed scheme, a retired person in good health who has time on their hands can provide care and support for elderly locals in need. Every hour worked is recorded as a “deposit” on a special personal account, which can later be used to pay for care workers’ time when the volunteer in turn needs assistance.

The idea for the project emerged as a result of the new situation facing many local authorities.

*“We haven’t noticed a reduction of solidarity in Switzerland. But it’s more about greater individual mobility and new family structures; family ties and networks are not as resistant as in the past. It’s therefore important to look for help from outside the family circle”* explained Ludwig Gartner, deputy director of the Federal Insurance Office which leads the project.

The bank is part of the Swiss tradition of time banking. Such programs are primarily regional, with around 40 different time exchanges in operation countrywide. This limits your opportunities for earning and spending time.

Time banking initiatives in Switzerland include Zürich Tauscht (Zurich), Zeittauschbörse Basel, Luzerner Tauschnetz (Lucerne), Zittbörse Chur und Umgebung (Chur), ZeitTausch Solothurn, Zeitbörse Benevol (St. Gallen), Scambio di Favori (Ticino), Zytbörse Thun, Tauschnetz Länggasse Bern, Tauschnetz Freiburg (Fribourg), Give&Get (Winterthur), and TALENT (Basel, Biel, St. Gallen, Zug, Aarau).



An aerial night view of the Hong Kong skyline, featuring numerous illuminated skyscrapers and buildings. The Victoria Harbour is visible in the center, with the city's dense urban landscape extending to the surrounding hills. The image is overlaid with a semi-transparent blue filter and a yellow border.

# Hong Kong

***Tiger Economy, Detailed Schemes for the Elderly  
with an Emphasis on Preventive Care***



# Summary of Relevant Government-Led Longevity Initiatives in Hong Kong

- In 2009 vouchers were introduced in the form of a pilot scheme for the over 70s to use private health services, including preventive care, to supplement existing public services, and in 2017, the government lowered the age threshold to 65.
- In 2018 Health Secretary Professor Yeoh presents the proposal, *"Fit for Purpose: A Health System for the 21st Century"*.
- Since 2015, four universities have been working with District Councils to develop a three-year action plan for each district, identifying directions and actions to enhance the age-friendliness of Hong Kong.
- In March 2018 finance chief Chan Mo-po rolled out some incentives that target the elderly and allocate more resources to improve services for them.
- Labor department has employment programmes specifically for the middle-aged, to provide subsidies to employers of unemployed jobseekers or retirees aged above 60. It is the government's latest effort to promote re-employment of the elderly.
- The Food & Health Bureau, has taken forward the Dementia Community Support Scheme, which aims to provide support services for elderly persons with mild or moderate dementia at District Elderly Community Centres through a "medical-social collaboration" model.
- Given its respectable science base and acute awareness of its demographic challenges, Hong Kong is notable for its lack of geroscience initiative.



# History of Hong Kong Government Involvement in Longevity

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- 1997 — **Handover from British Empire to Chinese suzerainty.**
- 1998 — **Health Centres Establishment.**  
In July 1998 the Department of Health established 18 Elderly Health Centres in Hong Kong, one in each district, to offer older people screening services and medical examinations, aiming to enhance primary health care by improving self-care ability, encouraging healthy living.
- 2008 — **Age-Friendly City Concept.**  
In 2008 the Hong Kong Council of Social Service (HKCSS) took the lead in promoting the concept of an age-friendly city by establishing the Age-Friendly Hong Kong Steering Committee.
- 2009 — **Pilot Scheme of Private Health Services Usage.**  
In 2009 vouchers are introduced in the form of a pilot scheme for the over 70s to use private health services, including preventive care, to supplement existing public services, and in 2017, the government lowered the age threshold to 65.
- 2015 — **Novel Plan for Age-Friendliness.**  
Since 2015, four universities have been working with District Councils to develop a three-year action plan for each district, identifying directions and actions to enhance the age-friendliness of Hong Kong.
- 2016 — **Estate-Based Approach in Service Provision.**  
Elderly commission publish blueprint, drafted by experts from five universities, suggesting an “estate-based approach” in service provision so that new residential developments would be “self-containing” where possible. Suggestions include at least one neighbourhood elderly centre in each new or redeveloped public housing estate, as well as in private housing.
- 2018 — **“Fit For Purpose”, New Incentives and Employment Programme Expansion.**  
In 2018 Health Secretary Professor Yeoh presents the proposal, *“Fit for Purpose: A Health System for the 21st Century”*. In March 2018 finance chief Chan Mo-po rolled out some incentives that target the elderly and allocate more resources to improve services for them. Also in 2018, the Labour Department expanded its Employment Programme for the Middle-aged to provide subsidies to employers of unemployed jobseekers or retirees aged above 60. It is the government’s latest effort to promote re-employment of the elderly.



衛生署  
Department of Health

社聯  
HKCSS



勞工處  
Labour Department



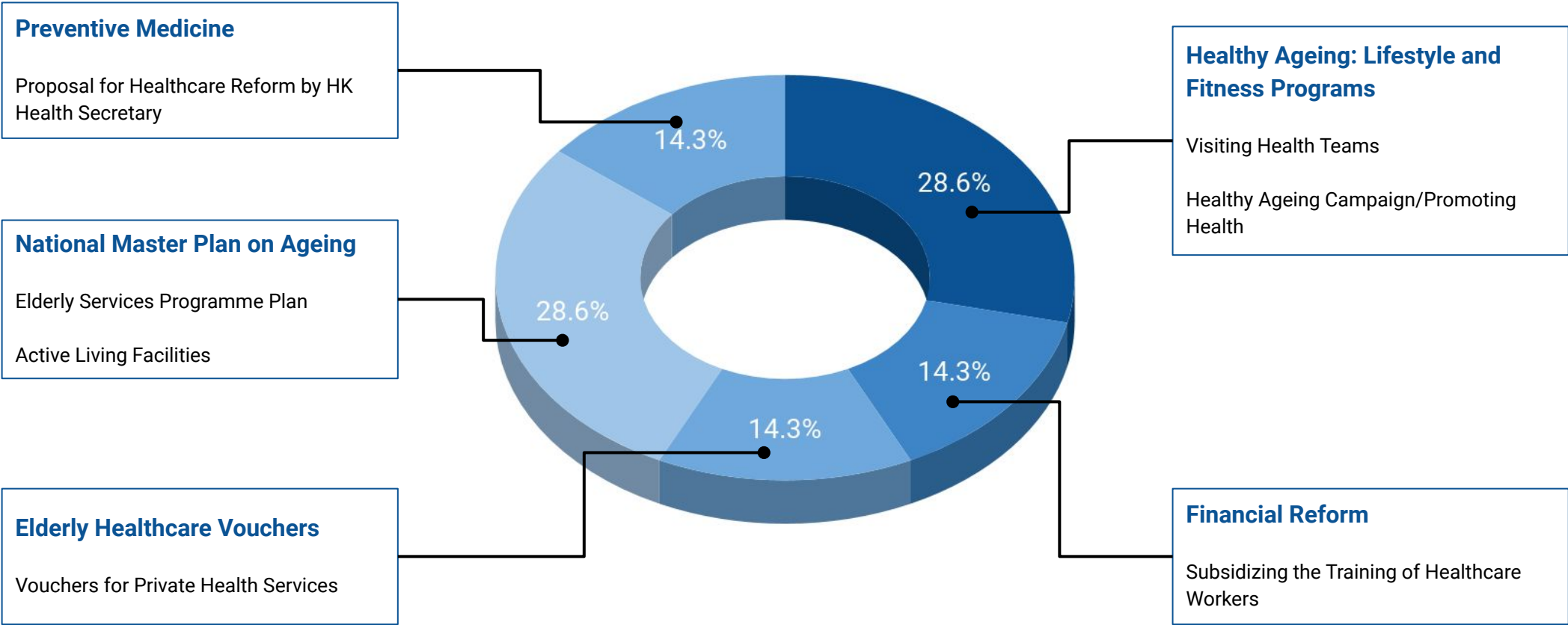
Life Expectancy	Both sexes life expectancy (2019)	82.7 years
	Male life expectancy (2018)	80.4 years
	Female life expectancy (2018)	85.53 years
GDP	GDP per capita, current prices (2018)	50.54 thousand (\$)
	GDP per capita, PPP (2018)	66.52 thousand (\$)
	GDP, current prices (2018)	381.72 billion (\$)
Population Ageing	Rate of population ageing	3.8 (2007-2017)
	Aged over 65 (2018)	17.4%
	Age dependency ratio (2017)	23%
Healthcare Efficiency	Health expenditure (2017)	6.2% of GDP
	Health expenditure per capita (2017)	3.670 thousand (\$)
	Healthcare efficiency score (2018)	87.3
Retirement	Total # retired	1 205 056
	Retired people proportion	16%
	Normal retirement age (Man/Woman)	65 years/ 65 years
	Early retirement age (Man/Woman)	65 years/ 65 years

## Longevity Initiatives

- Age of relevant initiatives: **20 years**
- **9** of WHO age-friendly cities and communities
- **6** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches



# Hong Kong Initiatives Level of Comprehensiveness

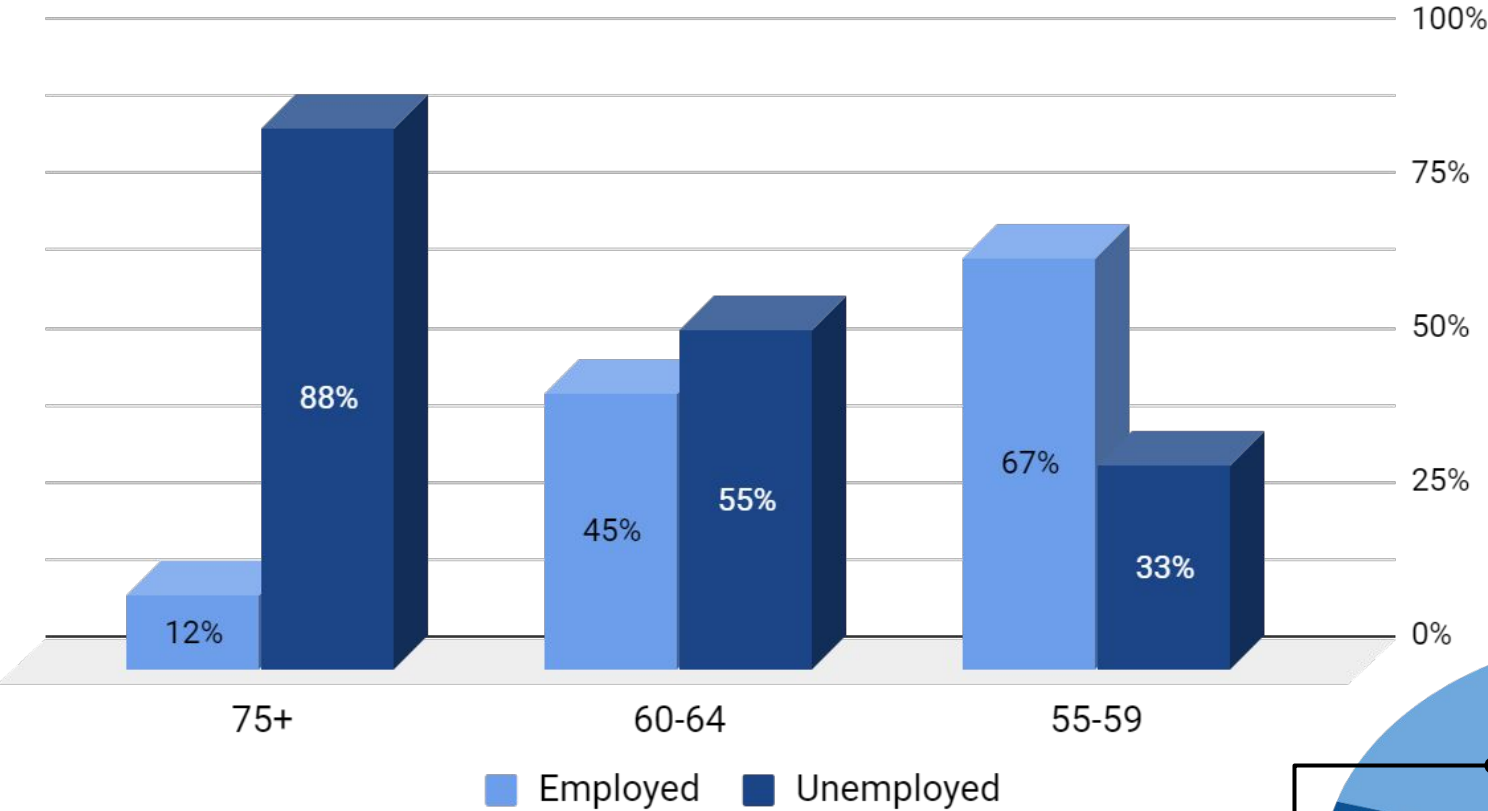


## Underrepresented Initiatives

Non-Medical Initiatives	Geroscience R&D	Longevity Industrial Strategy	AgeTech	Continuing Education
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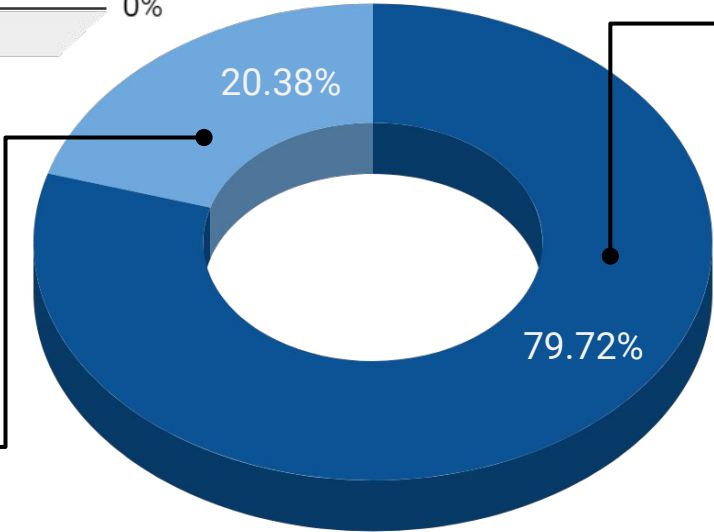


Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60





# FIT FOR PURPOSE: HEALTH SYSTEM FOR THE 21<sup>ST</sup> CENTURY

30<sup>th</sup> November 2011

FIT FOR PURPOSE:  
A HEALTH SYSTEM FOR  
THE 21<sup>ST</sup> CENTURY





In the past ten years, a voucher scheme for private health care that began with HK\$250 (US\$32) given to each elderly resident annually, and rose to HK\$2,000 five years ago, has become a normal part of life for many. It is commonplace for users to get flu treatment or a new pair of eyeglasses in clinics and optical shops displaying a characteristic green sticker. So why is the government now imposing restrictions on the vouchers' usage and how does that affect the elderly and practitioners? The vouchers were first introduced in the form of a pilot scheme in 2009 for the elderly to use private health services, including preventive care, to supplement existing public services. Five vouchers of HK\$50 each were provided annually to each resident aged 70 or above. In 2014, the scheme became a recurrent programme and the annual voucher amount was increased to HK\$2,000. In 2017, the government lowered the age threshold to 65. In 2018, elderly residents also received a one-off additional voucher of HK\$1,000. The arrangement will continue this year, according to the recent budget announcement. A study by Chinese University found that although the percentage of elderly residents who used vouchers rose from 28 per cent in 2009 to 94 per cent in 2018, the scheme failed to bring down the number of public hospital visits. Former health secretary Professor Yeoh Eng-kiong, who led the study, said even years after the programme was adopted, 78 percent of elderly patients still went to public clinics, while 73 percent did so before the vouchers were introduced.



The report, **“Fit for Purpose: A Health System for the 21st Century”** was prepared by former health secretary Professor Yeoh Eng-kiong for the Our Hong Kong Foundation. It showed that the present hospital-based medical system is unsustainable as Hong Kong faces a rapidly ageing society.

Hong Kong life expectancy is increasing, their health is not improving. At present, the hospitalisation rate of people aged 65 or above is four times higher than those below 65, with older adults taking up more than 50 per cent of all patient days. The public hospital system’s resources have come under tremendous pressure, with the bed occupancy rate frequently exceeding 100 per cent capacity.

**Hong Kong now seeks a two-pronged approach: increasing the supply of medical and health services while decreasing demand without compromising on quality.**

On the supply side, they are not only short of doctors but have an imbalance between the private and public hospital systems: public hospitals employ 40 per cent of the doctors, while caring for 90 per cent of the patients.

While the private medical market is flourishing, it is too expensive for most people when it comes to hospitalisation. Private health insurance coverage provides limited support in directing the flow of patients to private hospitals. Some insurance policies actually encourage patients to seek treatment in the public system.

Despite the manpower shortage, it is extremely difficult for doctors from overseas to qualify to practise there, with the licencing exam having an overall pass rate of only 20 per cent. While legitimate concerns have been raised about ensuring the quality of medical practitioners in Hong Kong, many of the objections have protectionist undertones. Although the city’s medical schools have begun boosting their student intake, it takes over nine years to train a specialist.

In contrast, Singapore has rapidly increased the institutions from which it accepts overseas-trained doctors, to over 150. The number of doctors in Singapore has increased 55 per cent, with a rate of 2.3 per 1,000 people, whereas Hong Kong still only has 1.9 doctors per 1,000.

Historically the Singapore government has been reluctant to increase the quota for medical students as it wants to ensure that sufficient talent can be spared for other disciplines.

Meanwhile, Hong Kong's hospital system has been falling behind in using technology to improve its efficiency. The number of people visiting the Hospital Authority's accident and emergency department fell by 4 per cent after the increase in charges from HK\$100 to HK\$180, which was intended to curb the number of non-urgent cases showing up at A&E departments. In an ageing society, with more patients with chronic illnesses, the increase in urgent cases may be unavoidable.

The Hong Kong Health Secretary has now proposed 24-hour triage hotlines to help people make informed choices, to substantially reduce the number of admissions. And more after-hours clinics, which could operate at a lower cost than A&E departments.

Hong Kong has not embraced the public health approach to keeping its population fit by promoting a healthier lifestyle. Long working hours and less physical exercise have been shown to be important in diminishing their wellness. Deprived living conditions also pose adverse risks to physical and mental health.

The Hong Kong Secretary plans to move away from a conventional health care system that focuses on acute hospital-centric care to primary care-led integrated people-centred care. This, he argues, requires a *"change in the mindset of leaders and health care providers to make possible the transition from a disease-focused and doctor-centred system to people-centred care that encourages individuals to take ownership of their own health"*.

Over the last ten years Hong Kong society has shown a growing interest in *Age-Friendliness*, with initiatives ranging from late life education opportunities and the age-friendly design of housing units and hospital wards, to priority seats on public transport and even in some fast food shops. In 2008 the Hong Kong Council of Social Service (HKCSS) took the lead in promoting the concept of an age-friendly city by establishing the **Age-Friendly Hong Kong Steering Committee**.

The aims were broad and inclusive: to promote public understanding, devise solutions to improve the lives of older people through consultation with elders and stakeholders, and to share information on best practice and successful initiatives.

In 2016 when the Hong Kong Chief Executive's Policy Address featured building an age-friendly community as a specific policy focus. To date, age-friendly platforms have been established in all 18 districts, with older adults empowered to raise their concerns, advocate change, negotiate with local government departments, and report to the media to raise awareness of public concerns. The district level is seen as the key level for collaborative projects because it is at the grassroots that people know the most urgent local needs of older people.

Progress towards a more age-friendly urban environment can be found across a number of different sectors. The Elder Academy scheme, an education and social inclusion initiative, was launched in early 2007 by The Labour and Welfare Bureau and the Elderly Commission. The activities provide access to learning opportunities in schools and university campuses and are aimed primarily at older people who have had little or no education. The scheme optimizes the use of existing educational facilities and has been successful in promoting both lifelong and initial learning for older people, encouraging participation and helping to maintain physical and mental wellbeing. School and university students are engaged in the scheme, thereby also promoting civic education and intergenerational understanding. Currently, some 125 elder academies in various districts and seven tertiary institutions offer a wide variety of courses.

Another intergenerational scheme is run by the NGO Aberdeen Kai Fong Welfare Association. This focuses on community education, intergenerational learning, and volunteer development, and promoting cultural heritage. Older people interact with students of all ages in activities including: creating stories and plays with primary school children; mentoring secondary school children and helping with homework; and secondary school children organizing trips with older people to explore Hong Kong sites.

The Hong Kong Housing Society (HKHS), a non-profit organization that dates back to 1948, is in charge of age-friendly accommodation design and development.

Its housing units emphasize home safety, care and support, health and wellness, so that people can grow old in their own homes. While HKHS provides only a relatively small part (just over 4%) of Hong Kong's extensive public housing system, it is offering affordable housing in a niche position between the expensive private sector and government public rental housing.

In terms of health infrastructure one example is age-friendly hospital wards, a response to the large number of hospitalized frail older people, up to one-third of whom may have dementia. Care can be inadequate because of a lack of awareness of their needs. Currently two hospitals have adopted a principle of age awareness when refurbishing their wards.

Securing wider support for age-friendly policies is also important. The aims of the Hong Kong Jockey Club CADENZA Project include changing the mindset and attitudes of the general public through a range of training and public education programmes as well as nurturing academic leadership in gerontology.

Collaboration between organizations and the implementation of innovative elderly services are also encouraged in order to bring about a new mode of elderly care services to prepare for a rapidly ageing society, including planning for the needs of the "soon to be old" (Phillips et al., 2018).

In order to assess the age-friendliness of the 18 districts, between 2015 and 2017 the Hong Kong Jockey Club conducted a baseline assessment using questionnaire surveys and focus group interviews, in partnership with ageing research centres in four universities: The Chinese University of Hong Kong, Hong Kong Polytechnic University, The University of Hong Kong and Lingnan University.



Meetings at the district level included older people, district councillors, and local government officials who reviewed findings and proposed improvement projects.

Using these findings, professional support teams from the four universities have worked with District Councils to develop a three-year action plan for each district, identifying directions and actions to enhance their age-friendliness.

Hong Kong has demonstrated considerable enthusiasm and practical outcomes in the age-friendly city movement at both central and local levels. However, a number of policy questions remain. For example, should the young-old, the old, or the oldest-old be listed first in a policy agenda? Should healthy older adults or the frail be given prior attention in policy planning? Should the most socially deprived older adults be targeted in planning?

Some stereotypes of older persons are also enduring and when resources are tight older people are not always seen as high on the list of priorities.

For example, research indicates that the Hong Kong public values technological advances in health services above care of the elderly and end-of-life care, in contrast to a similar British survey in which end-of-life care was ranked the second highest.

Further shifts in public attitudes may need to be part of Hong Kong's ongoing evolution into a more age-friendly city. Nevertheless, the progress in territory-wide engagement with the concept of age-friendliness at official, charity, NGO, community and even family levels, bodes well for future progress in Hong Kong.



- As Hong Kong is comparatively new to the concepts of Healthy Ageing, the Health and Welfare Bureau (HWB) and concerned departments, are taking the lead to explain the concepts and the strategies to the community and the service providers, and to initiate community wide discussions on Healthy Ageing. This will be done in the short term through a three year campaign on Healthy Ageing.
- The focus in the first year of the campaign is on the promotion of physical well-being, highlighting the benefits of a healthy lifestyle for the whole community, particularly for the older persons. This will be followed by the promotion of psychosocial well-being in the subsequent two years with continued reinforcement on the promotion of physical well-being.
- To encourage extensive community participation, the Committee will also launch a Community Partnership Scheme (CPS) aimed at rallying multi-sectoral participation in the promotion of Healthy Ageing by supporting innovative projects and programs on Healthy Ageing. CPS is supported by a grant of \$21 million from the Hong Kong Jockey Club Charities Trust.
- The Committee acknowledges that efforts to promote Healthy Ageing in Hong Kong should be sustained and perhaps further refined as we gain more experience. A Steering Group will be set up to oversee the organization of the three year campaign, and to tender advice to the EC on future developments.



By the end of 2018, the Labour Department expanded its Employment Programme for the Middle-aged to provide subsidies to employers of unemployed jobseekers or retirees aged above 60. It is the government's latest effort to promote re-employment of the elderly.

Under the expanded programme, eligible employers would be given HK\$4,000 per month for six to 12 months, according to an official blog posting by Chief Secretary Matthew Cheung Kin-chung on April 15.

Currently, employers who take on unemployed jobseekers aged above 40 can get a HK\$3,000 subsidy per month for three to six months under the programme.

According to Cheung, those aged between 50 and 64, and "young olds" aged from 65 to 74, are being encouraged to work because of Hong Kong's fast-ageing population and labour shortage.

As at the end of 2017, 363,800 individuals aged above 60 – or more than 20 per cent of the population group – were working, among which more than one-third were aged above 65, according to the statistics department.

The number of workers aged above 60 increased by nearly 1.7 times over the past decade and by more than half (59 per cent) in the last five years, official statistics show.

Meanwhile, elderly poverty has become more acute in Hong Kong as living costs have risen and the establishment of a universal retirement pension remains out of sight.

From 2012 to 2016, the number of those aged above 65 in poverty increased from 388,000 to 478,000, or from 43.5 percent to 44.8 per cent of the population group, according to a Commission on Poverty report.

The Elderly Services Programme Plan, a two-year study commissioned by government advisory group Elderly Commission, suggests introducing long-term health care insurance for the city's ageing population to ease the financial burden of the government. Demand for long-term nursing facilities is projected to double from about 60,000 this year to 125,000 by 2051. This is the first time since 1997 that long-term planning for the city's elderly has been done. Dr Lam Ching-choi, chairman of the Commission, said it was "never too late" for such a plan.

Lam is confident that the suggestions would be implemented by the government, but acknowledged the challenges ahead.

Released in 2016, the blueprint, drafted by experts from five universities, suggested an "estate-based approach" in service provision so that new residential developments would be "self-containing" where possible. Suggestions include at least one neighbourhood elderly centre in each new or redeveloped public housing estate, as well as in private housing. There should also be a district elderly community centre in each new town with a population of 170,000. The report also called on the government to reinstate population-based planning ratios for elderly services in the Hong Kong Planning Standards and Guidelines, a practice ditched in 2003.

Meanwhile, the importance of a more cost-effective model for public expenditure on long-term elderly care services was highlighted. The report questioned the sustainability of subsidised long-term elderly care services, with a suggestion to introduce long-term insurance as an alternative. Labour Party lawmaker Dr Fernando Cheung Chiu-hung welcomed the study's suggestions and said they were long overdue. "We have been criticising the government's ignorance of elderly needs during the town planning process for so long. A community should be self-contained," he said.

Lawmaker Chan Kin-por from the insurance sector agreed with the long-term health care insurance, which he said, could be a way out for the city amid its ageing population. "People nowadays usually only purchase medical insurance as they do not know much about long-term care – but the latter can actually provide alternatives, such as home-care services," he said. "It would also encourage better retirement planning for residents who are more well-off."



Other recommendations made by the report include:

- Strengthening services for elderly persons with dementia and considering the disease as an integral part in the planning of elderly services.
- Specific caregiver training for foreign domestic helpers to enhance their capability in the role.
- Encouraging private developers to provide more elderly service facilities and be “age friendly”.
- Strengthening public education to promote a positive image of the elderly, enhance their role in society as well as foster positive intergenerational relations.





The Food & Health Bureau, in collaboration with the HA and the Social Welfare Department, has taken forward a two-year pilot scheme called the Dementia Community Support Scheme, which aims to provide support services for elderly persons with mild or moderate dementia at District Elderly Community Centres through a "medical-social collaboration" model. Since its launching in February 2017, the scheme has been well received by the patients, carers and the healthcare and social service professionals involved. To this end, the Government will regularise the scheme and expand it to all District Elderly Community Centres in Hong Kong.

## **Research - quality of healthcare for the ageing**

Given the ageing population and prevalence of chronic and complex diseases, the Government has been putting elderly care and service at the top of the policy agenda. To enhance the quality of healthcare services for the elderly, in 2015, the Government commissioned the Chinese University of Hong Kong to conduct a three-year research study on the quality of healthcare for the ageing. The study will inform policy in response to the challenge of the ageing population in healthcare, which includes healthcare services supporting elderly people with chronic diseases and quality of end-of-life care. The Government will study the findings and recommendations of the report when it is available, and consider carefully the next step forward on the provision of healthcare services for the elderly. In the meantime, the Hospital Authority, being the major public palliative care service provider, has formulated the Strategic Service Framework for Palliative Care to guide the development of palliative care service in the coming five to 10 years. Besides, as pledged in the Chief Executive's Policy Address 2017, we will consider amending the relevant legislation to give patients the choice of "dying in place".

## **Non-communicable diseases**

On the other hand, there is an increased prevalence of unhealthy lifestyle practices driven by the problem of ageing population,, changes in social fabrics and behavioural patterns, and globalisation. Hong Kong is thus facing an unprecedented threat from NCDs. NCDs are major causes of ill health, disability and death. In 2016, the major NCDs, namely cardiovascular diseases including heart diseases and stroke, cancers, diabetes and chronic respiratory diseases, accounted for about 55% of all registered deaths in Hong Kong. In the same year, NCDs caused about 104,600 potential years of life lost before the age of 70. The health conditions of individuals also have a bearing on families, healthcare systems, and the entire society and economy as a whole.



# Promoting Health in Hong Kong: A Strategic Framework for Prevention and Control of Non-communicable Diseases

The Hong Kong SAR Government is committed to protecting population health and reducing the burden of NCDs. As prevention and control of NCDs require the combined and sustained efforts of the Government, the community and individuals, the Government launched in 2008 "Promoting Health in Hong Kong: A Strategic Framework for Prevention and Control of Non-communicable Diseases" to guide and give impetus to the efforts. A high-level multi-disciplinary and inter-sectoral Steering Committee on Prevention & Control of Non-communicable Diseases, under the chairmanship of the Secretary for Food & Health, me and former, was set up at the same time to oversee the overall roadmap to combat NCDs. These paved the way for launching various action plans subsequently to promote a healthy diet and physical activity participation, reduce alcohol-related harm and strengthen injury prevention in Hong Kong.

They have taken actions and devoted substantial amounts of resources on the prevention and control of NCDs over the past decade. Overall, the risk of premature mortality from cardiovascular diseases, cancers, diabetes and chronic respiratory diseases has been steadily decreasing over the past three decades. Yet they remain concerned about the risk factors for NCDs taking a toll on their general population.

The Population Health Survey 2014-15 conducted by the DH showed that for those aged 15 to 84, the prevalence of hypertension, diabetes mellitus and high blood cholesterol were significant and were as high as some 28%, 8%, and 50% respectively. This is the "Rule of Half" : for every person known to be suffering from any of these conditions, at least one other person with the disease went undiagnosed and untreated. The fact that half (50%) of Hong Kong people aged 15 to 84 are overweight or obese would make the situation worse as being overweight and obesity are significant risk factors for development of NCDs, including cancers.

The survey also revealed that in the past 12 months, some 95% of the Hong Kong people aged 15 or above consumed less than five servings of fruit and vegetables a day as recommended by the World Health Organization (WHO); 13% did not have adequate level of physical activity to be of benefit to health; and some 61% had consumed alcohol, a proven cancer-causing agent for over 200 disease and injury conditions. This represents a 84.4% increase in regular or occasional drinkers, when compared with the findings of our first survey conducted 10 years earlier.



# Promoting Health in Hong Kong: A Strategic Framework for Prevention and Control of Non-communicable Diseases

Moreover, alcohol drinking is common among young people, with 30.5% of the people aged 15 to 17 being regular or social drinkers in the past 12 months. Apart from the above, the Thematic Household Survey conducted by the government showed that 10% of Hong Kong people aged 15 years or above had a daily cigarette smoking habit. If these modifiable behavioural and biomedical risk factors are left uncontrolled, we can expect significant health, social and economic consequences for Hong Kong population and society.

As a member of the public health arena Hong Kong receives WHO guidance in their work in the fight against NCDs. For instance, just to name a few, the WHO's "Global Action Plan for the Prevention and Control of NCDs 2013-2020", "Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of non-communicable diseases" and "Report of the Commission on Ending Childhood Obesity" provide a road map and a menu of policy options for Governments to work systematically and collectively to reduce the NCD burden.

The Hong Kong SAR Government has recently launched (on May 4, 2018) a new strategy and action plan entitled "Towards 2025: Strategy & Action Plan to Prevent & Control Non-communicable Diseases in Hong Kong" (SAP), with a view to reducing the burden of NCDs, including disability and premature death, in Hong Kong by 2025. It sets out an armoury of overarching principles, approaches and strategic directions in line with the WHO's recommendations, and provides us new impetus for stronger partnerships and closer collaborations for the good of the community and our future generations. It is a product of collaboration among stakeholders from different sectors in society.

Aligning with the WHO's Global Action Plan, the SAP in Hong Kong will focus on four NCDs (namely cancers, cardiovascular diseases, diabetes and chronic respiratory diseases) and four shared behavioural risk factors (namely unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol) that are potentially preventable or modifiable.



# Promoting Health in Hong Kong: A Strategic Framework for Prevention and Control of Non-communicable Diseases

The SAP has set out nine local targets to be achieved by 2025, with "a 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancers, diabetes or chronic respiratory diseases by 2025" being the ultimate target. The other eight targets aim to achieve reduction in binge drinking and harmful use of alcohol as well as daily intake of salt or sodium and tobacco use. They shall also aim to encourage more physical activity and contain the prevalence of raised blood pressure, diabetes and obesity, prevent heart attacks and strokes through drug therapy and counselling, and improve the availability of affordable basic technologies and essential medicines to treat NCDs.

In order to reach their targets, new strategic directions will be adopted to accelerate actions on the NCD reduction agenda. The Hong Kong SAR Government will demonstrate leadership in many ways, such as by transforming schools into healthy settings for students' development, creating supportive physical and social environments for physical activity, fostering effective partnerships with primary care professionals, and keeping in view accumulating evidence and overseas experience on interventions recommended by the WHO. Their overall objective is to promote healthy life through less alcohol, less salt and sugar, less tobacco and more exercise.

The SAP has put forward a sustained and systematic portfolio of initiatives to introduce interventions throughout the course of life to help prevent occurrence and progress of NCDs, thereby addressing the NCD burden. These include:

- (a) Strengthening NCD surveillance by enhancing the existing surveys and information collection to keep track of population-based NCD status and key behavioural and biomedical risks;
- (b) Carrying out alcohol screening and brief interventions, including to strengthen treatment services for people with alcohol problems and support people who want to cut down or stop drinking alongside stepped up education;
- (c) Promoting physical activity participation in schools and society by collaborating with the education sector and other sectors with enhanced opportunities and accessibility to physical activity;
- (d) Continuing discussion with the trade on product reformulation to reduce salt in food alongside ongoing efforts to implement various salt reduction schemes and dialogue with the catering industry to supply a greater variety of food with less salt;



# Promoting Health in Hong Kong: A Strategic Framework for Prevention and Control of Non-communicable Diseases

(e) Adopting a multi-pronged approach in tobacco control including the expansion of statutory no-smoking areas, strengthening the regulatory regime on e-cigarettes and heat-not-burn tobacco products and the implementation of a smoking cessation public-private partnership programme; and,

(f) Strengthening the health system at all levels, in particular comprehensive primary care for prevention, early detection and management of NCDs based on the family doctor model.

The SAP will adopt 34 local NCD indicators including 25 key indicators derived from the WHO's global monitoring framework (such as cancer incidence and mortality; prevalence of binge drinking among adolescents; and the detection rate of being overweight and obesity in primary and secondary students) and nine supplementary indicators of local relevance (such as prevalence of daily cigarette smoking among persons aged 15 years and above, and the breastfeeding rate on discharge from hospitals) to monitor the plan's effectiveness.

Although Hong Kong enjoys the status of one of the economies with the longest life expectancy, there are real challenges in achieving healthy ageing. To this end the DH and the steering committee are committed to taking a leading role in implementing the agenda. Moreover, the health sector now works in concerted efforts with all sectors in the community, to foster cooperation across sectors and work in close partnership with the community and members of the public to build a health-enhancing physical and social environment to promote health of all Hong Kong people.

They also closely monitor, review progress of implementation and communicate their achievement of the stated actions with members of the community. We must also keep in view global, regional and local developments and emerging evidence of strategies in light of changing social and environmental circumstances, e.g. the UK's recent introduction of sugar tax to curb sugar consumption.





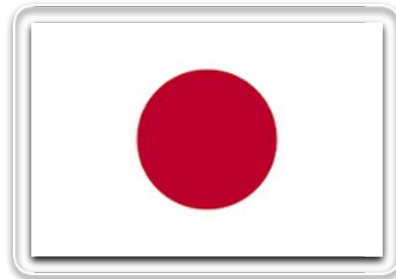
# Japan

*Early Nation to Face Silver Tsunami,  
Age-Friendly Urban Planning,  
Robotics for the Elderly and  
Joint Research Initiative with the UK*



# Summary of Relevant Government-Led Longevity Initiatives in Japan

- In 2013, the government passed a measure requiring companies to raise the mandatory retirement age to 65. But full compliance won't be required until 2025.
- In 2019 Medical researchers in Britain and Japan joined forces to research treatments for some of the most debilitating degenerative diseases, including dementia.
- In 2018 Japan's government commits to an 'ageless society' with planned policies encouraging seniors to stay healthy and keep working.
- In 2018 the Ministry of Economy, Trade and Industry (METI) recently inaugurated the Well Ageing Society Summit Asia-Japan in Tokyo in order to ride the wave of the silver tsunami and turn a negative into a positive.
- Urban planning : Japan has stepped up to the challenge of apply the WHO's principles for an age-friendly city, with its municipal plans for Akita and Kanagawa neighbourhoods.
- Investment in robotics : Ministry of Economy, Trade and Industry (METI) has not only renewed its commitment to robotics but has sought to extend their function to improving the lives of the elderly.



2011 — **Akita City joined WHO Global Network for Age-friendly Cities and Communities in 2011.**



2013 — **Government passed a measure requiring companies to raise the mandatory retirement age to 65.**  
But full compliance isn't required until 2025.



2013 — **Akita City established the First Akita Age-friendly City Action Plan (2013-2016).**  
In the first Action Plan, Akita City promoted senior citizen's social participation, and facilitated motivation and public awareness of Age-friendly City with the help of local community association.

2016 — **Kanagawa prefecture publishes *Healthcare New Frontier - Initiatives based on the Concept of ME-BYO*.**  
“Curing ME-BYO” the scope of which is something broader than that of “disease prevention” in the context of Western medicine.



2016 — **Society 5.0, Japan's industrial strategy, is introduced**  
It includes addresses to the challenges of ageing population. with “*smart approaches, enabled by technology but shaped by smart people*”.

Jan 2018 — **Japan's government aims for 'ageless society' planned policy encouraging seniors to stay healthy and keep working.**  
The ruling Liberal Democratic Party's related committee broadly approved the draft, and Prime Minister Shinzo Abe's Cabinet endorsed it the same month.

July 2018 — **The Ministry of Economy, Trade and Industry (METI) inaugurate the Well Ageing Society Summit Asia-Japan in Tokyo.**  
In order to ride the wave of the silver tsunami and turn a negative into a positive.





## Life Expectancy

Both sexes life expectancy (2019) 85.8 years

Male life expectancy (2018) 81.1 years

Female life expectancy (2018) 87.1 years

## GDP

GDP per capita, current prices (2018) 41.02 thousand (\$)

GDP per capita, PPP (2018) 45.56 thousand (\$)

GDP, current prices (2018) 5 180 billion (\$)

## Population Ageing

Rate of population ageing 6.2 (2007-2017)

Aged over 65 (2018) 28.3%

Age dependency ratio (2017) 45%

## Healthcare Efficiency

Health expenditure (2017) 10.7% of GDP

Health expenditure per capita (2017) 4.717 thousand (\$)

Healthcare efficiency score (2018) 64.3

## Retirement

Total # retired 34 293 754

Retired people proportion 27%

Normal retirement age (Man/Woman) 65 years / 65 years

Early retirement age (Man/Woman) 60 years / 60 years

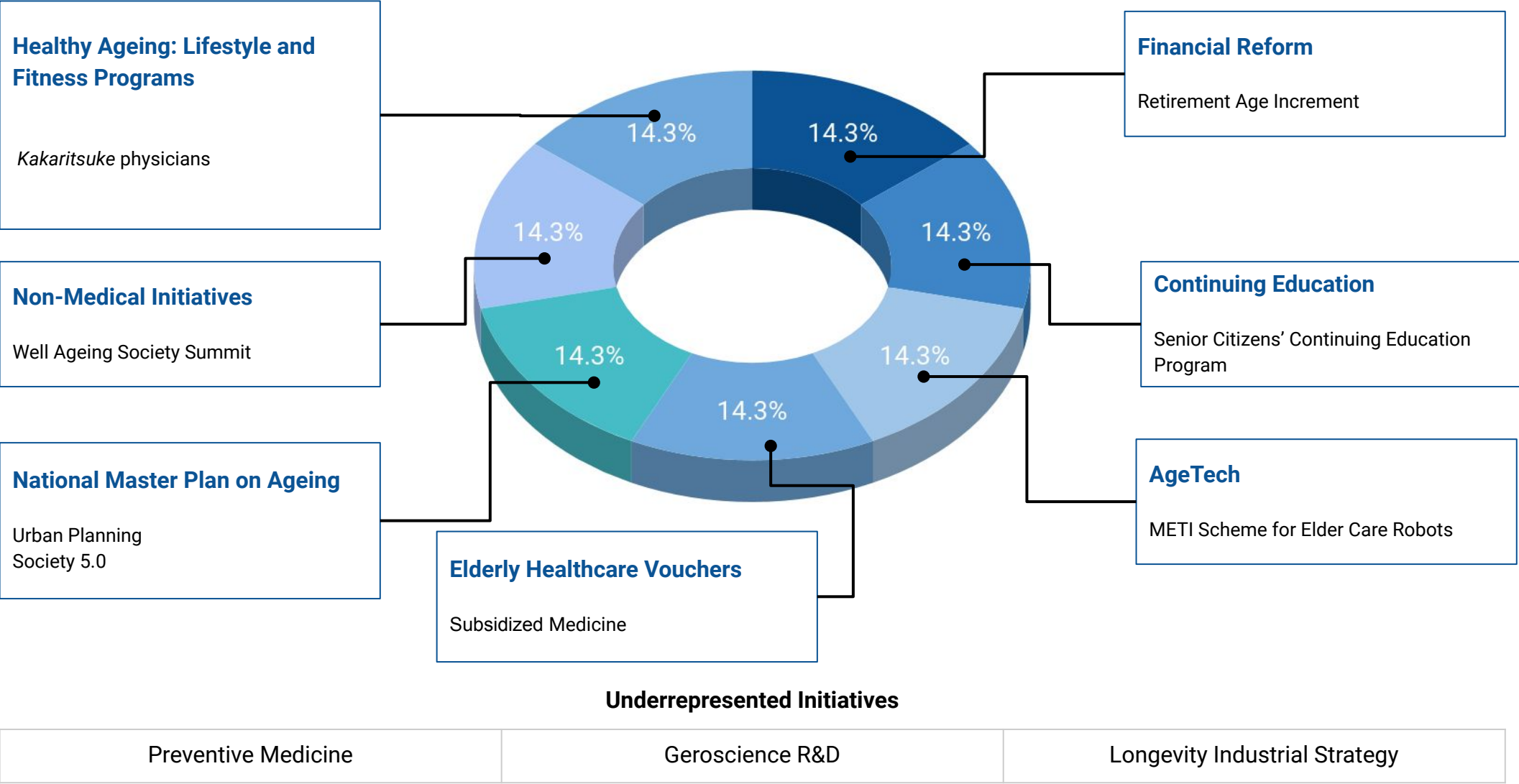
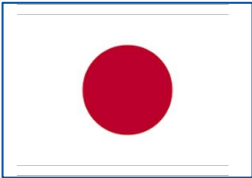
## Longevity Initiatives

- Age of relevant initiatives: **8 years**
- **24** of WHO age-friendly cities and communities
- **6** initiatives focused on non-medical improvement of quality of life





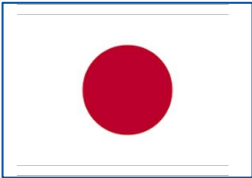
# Japan Initiatives Level of Comprehensiveness





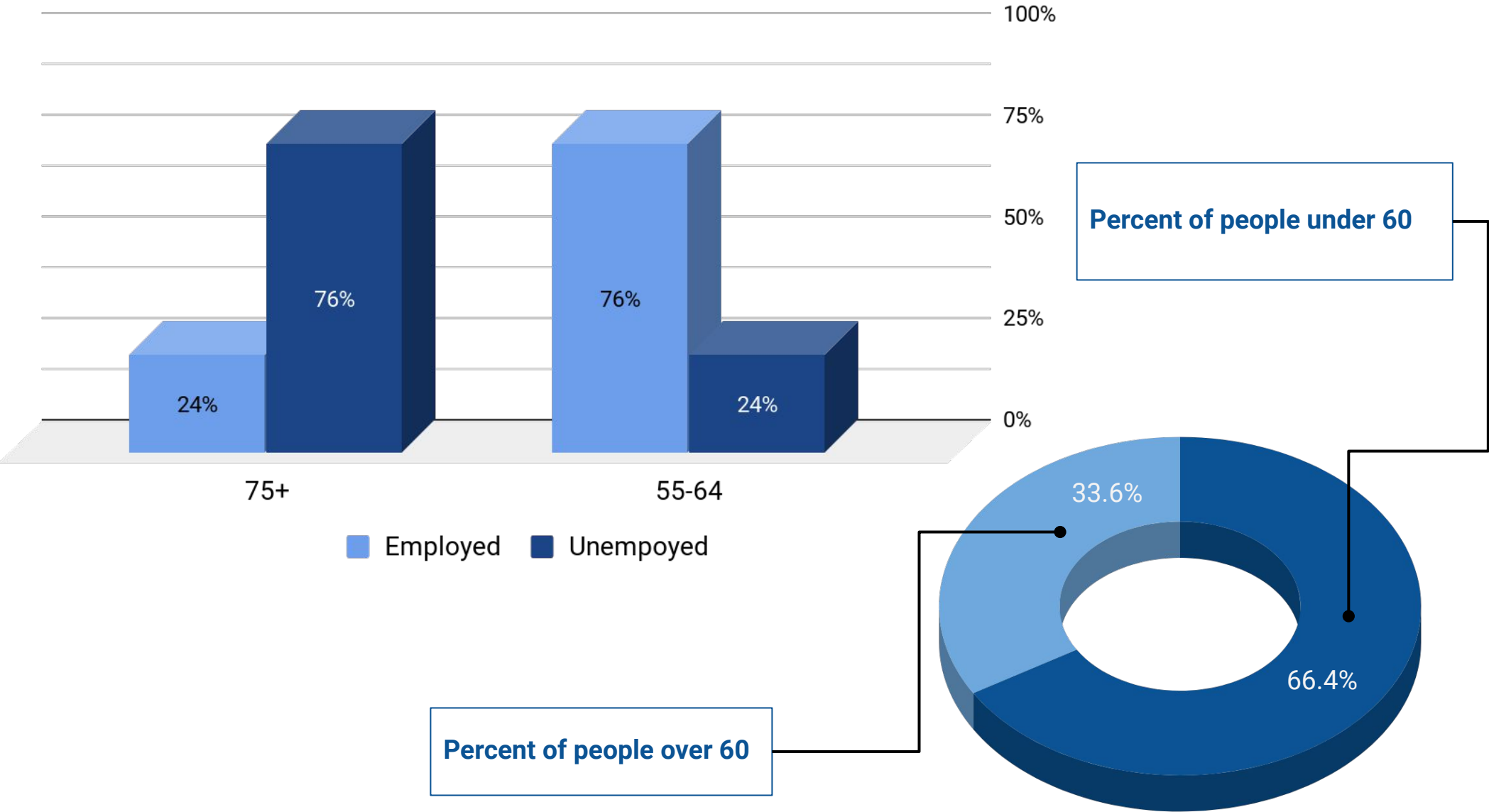


# Japan Age/Employment Range



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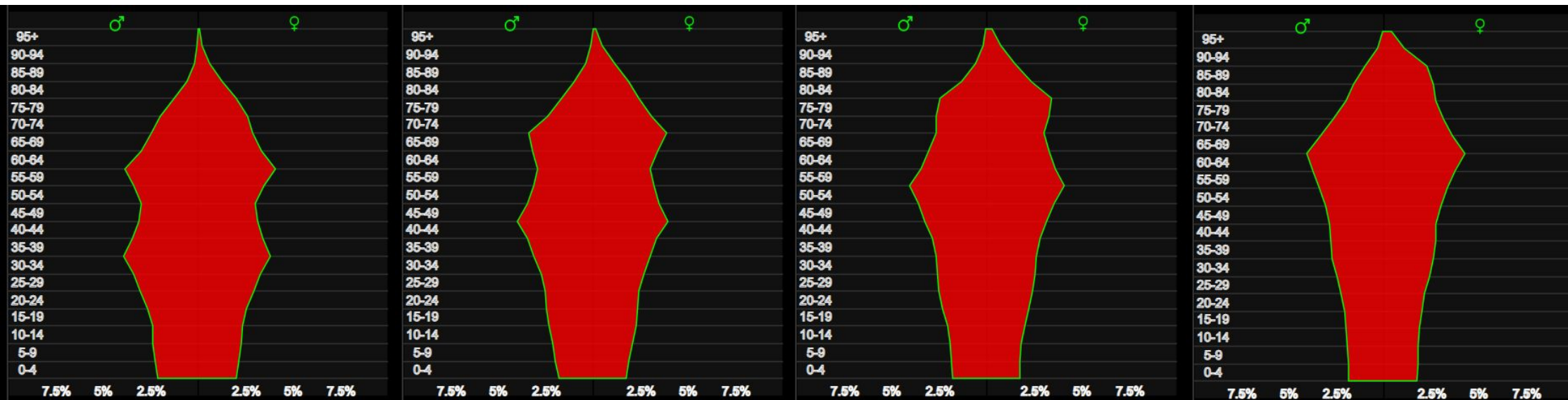
Fraction of the Unemployed by Age



Japan is currently the world's oldest country, and it's set to get even older. The number of elderly people aged 65 or older accounts for 26.7 percent of the 127.11 million total population, up 3.7 percentage points from five years ago, a summary report of the 2015 national census shows. In 2050, it's estimated by the government that 40% of Japan's population will be over 65. In the last few decades, the country's social security budget has increased 15%. While 5 decades ago there were 12 workers for every retiree, there will be an equal 1:1 ratio in 50 years. This is one of many demographics problems Japan must address.

By 2020, the world will have 13 “super-aged” societies – societies such as Japan where more than one in five of the population is 65 or older – up from just three today, according to a report from the Moody’s rating agency. It said the number of “super-aged” countries would reach 13 in 2020 and 34 in 2030. Only Germany, Italy and Japan meet that definition today, it said. Most of the countries set to join the “super-aged” club by 2020 are in Europe and include the Netherlands, France, Sweden, Portugal, Slovenia and Croatia. But by 2030 they will be joined by a more diverse group including Hong Kong, Korea, the US, **the UK** and New Zealand.

## Ageing demographic projections 2010 - 2050



Perhaps the equivalent of the UK's Industrial Strategy is Japan's Society 5.0. Society 5.0 was proposed in the 5th Science and Technology Basic Plan as an idealised future society that Japan should work toward.

Japan's vision for the future is a super-smart society where technology such as big data, Internet of Things (IoT), artificial intelligence (AI), and robots fuse into every industry and across all social segments.

Like the UK Industrial Strategy, Society 5.0 also recognises the ageing society as a grand challenge.

Now a new UK-Japanese research programme aims to help treat patients with chronic degenerative diseases and bring together British and Japanese businesses to develop a new generation of assisted living products and services both countries also agree new collaboration on science and innovation, the ethical use of big data and robotics today measures aim to harness mutual strengths in science and innovation as part of both nations' industrial strategies.

The partnership includes a £10 million programme led by the UK's Medical Research Council (MRC) and Japan's Agency for Medical Research and Development (AMED) that will advance regenerative medicine. The research will help understanding in critical **regenerative processes** in human health and translate research into tools and technologies to treat the diseases of ageing.

Britain will join Japan in its **Well Ageing Society Summit and Global Round Table for Dementia** (see slide 'Ministry of Economy, Trade and Industry (METI) Well Ageing Society Summit Asia-Japan').

British and Japanese businesses will also be working together to develop and showcase a new generation of assisted living products. Through a joint competition focused on employing Artificial Intelligence (AI) and robotics in assisted living, they can access funding to help create safe, ethical and intelligent home environments.

Previous government initiatives have already specified the need for advances in telemedicine, monitoring Service, and **nursing robots** (see next slide) for improving the lives of the elderly.



Japanese Prime Minister Shinzo Abe promised after his election in 2012 to increase the country's gross domestic product by almost a fifth to 600 trillion yen (€4.95 trillion) by 2020.

Robotics, artificial intelligence and smart connected devices are expected to contribute almost a third of this anticipated growth.

But the government sees a wider range of potential applications and recently revised its list of priorities to include robots that can predict when patients might need to use the toilet. Dr Hirohisa Hirukawa, director of robot innovation research at Japan's National Institute of Advanced Industrial Science and Technology, said the aims included easing the burden on nursing staff and boosting the autonomy of people still living at home. "Robotics cannot solve all of these issues; however, robotics will be able to make a contribution to some of these difficulties," he said. **The Ministry of Economy, Trade and Industry (METI)** hopes that four in five care recipients accept having some support provided by robots by 2020. Elderly people dealing with social isolation and loneliness are at increased risk of a variety of ailments, from cardiovascular disease and elevated blood pressure to cognitive deterioration and infection. A new wave of elderly support robots are now springing up, which not only provide a rudimentary form of company and comfort, but also help the elderly out of bed, remind them owners to take medication, remain hydrated, and so on.

**Top:** A robot "Robear" lifting a woman for a demonstration in Nagoya, central Japan. The robot can transfer frail patients from a wheelchair to a bed or a bath. Photograph: Jiji Press/AFP/Getty Images.

**Bottom:** Elderly support robot providing comfort.







*On February 16, 2018, Prime Minister Shinzo Abe held the 29th meeting of the Ageing Society Policy Council at the Prime Minister's Office*

The new General Principles Concerning Measures for the Aged Society has the following pillars:

- Aim to develop an ageless society where people of all generations can play an active role based on their desires.
- Create local communities where people can clearly envision their livelihoods in the golden years at any stage of their life;
- Utilize new measures enabled by the achievements of technological innovation to deal with an ageing society.

On February 16 2018, the Japanese government approved a new **General Principles Concerning Measures for the Aged Society** describing guidelines for medium- to long-term policies for dealing with an ageing society. This is the first time in approximately five years (since 2013) that the General Principles have been updated, and for the first time, it has been clearly indicated that consideration will be given to expanding the age to begin receiving pension payments to 71 or older, in order to make up for the shortage of workers due to declining birth rates, as well as creating an environment in which seniors with a desire to work can continue working.

One of the pillars of the General Principles is to create an “ageless society” in which people of all ages can be as active as they want, revising the current system that handles people uniformly based on their age and the existing social structure of the working generations supporting seniors. Currently, the age to begin receiving public pension payments is normally 65, but people can choose to start receiving them as early as 60 or as late as 70, with monthly payments increased if the starting age is 65 or older. The new General Principles include guidelines for expanding this system beyond 70 years old. The government plans to proceed with discussions on organizing this system, and revise the law in 2020. Anticipating people working at older ages, the goal is to increase flexibility in starting ages for receiving pension payments.

*“ The general trend of uniformly seeing those aged 65 or over as elderly is losing credibility. The government will review the (current) standardization by age bracket and aim to create an ageless society where people of all generations can be active according to their wishes. ” ~ 2018 General Principles Concerning Measures for the Aged Society policy document*





# Ministry of Economy, Trade and Industry (METI) Well Ageing Society Summit Asia-Japan

In July 2018 the Ministry of Economy, Trade and Industry (METI) inaugurated the Well Ageing Society Summit Asia-Japan in Tokyo in order to ride the wave of the silver tsunami and turn a negative into a positive.

Aimed at showcasing Japanese healthcare and research and development as well as investment in these sectors, the summit brought together large corporations, startups, investors, healthcare experts and policymakers. About 20 startups participated in pitch contests themed on high-quality digital health and ageing.

Participants discussed the importance of Japan's universal health insurance system, which dates to 1961. The public-private regime provides a high standard of care and user costs are relatively low compared to other advanced countries. As one of the largest systems of its kind in the world, with over 127 million subscribers, Japan's healthcare system has accumulated a treasure trove of medical data.

Under a recent legal revision, medical data will be anonymized and provided for various uses. While records on procedures and medication prescribed were previously available, the new regime allows researchers to see outcomes as well. Large volumes of high-quality data will be used for disease research as well as drug development and side effects. Industry players may also use the data to improve care regimes and develop clinical support software.



経済産業省

*Ministry of Economy, Trade and Industry*



Akita City's three key priorities for its age-friendly programme have been:

- To involve the residents of Akita City in a leading role;
- To ensure co-operation between private enterprises, administrative organisations and citizens;
- To encourage cooperation between all the relevant departments in the City Government.

In 2011, Akita became the first Japanese member of the Global Network for Age-friendly Cities and Communities, committing to applying WHO's age-friendly principles in its work. Since then, the city has made great strides through creative and innovative action. In this article, AARP's Stephanie Firestone highlights the many ways that Akita is transforming its physical and social environments to better meet the needs and desires of its older residents.

Much of Akita City's age-friendly work is guided by what it calls a "soft" approach, based on community-building and strengthening the social fabric of the city.

Unlike physical change in buildings or roads, which take time to conceive, plan and execute, some social efforts can create quick results. One example is the popular one-coin bus service, which is designed to encourage older adults to be socially active by charging a single fee for rides on fixed-route buses. The project started in 2001 by targeting people 70 and older. When the qualifying age was cut to 68, the number of users increased by 11.4 percent, and the program lowered the age again to 65 in October 2017 hoping for greater expansion. The one-coin program purposely interfaces with the Age-Friendly Partner Program — discounts and free drinks are offered by stores and bathhouses to anyone showing a one-coin certificate.

The government of the prefecture of Kanagawa, the second most populous in Japan (adjacent to Tokyo), has been promoting its own grand policy package called “Healthcare New Frontier (HCNF)”. This is a bundle of healthcare and industrial/regional policies which aims to bring the longest healthy life expectancy of Japan to Kanagawa and to create new market and industry, by integrating two policy approaches:

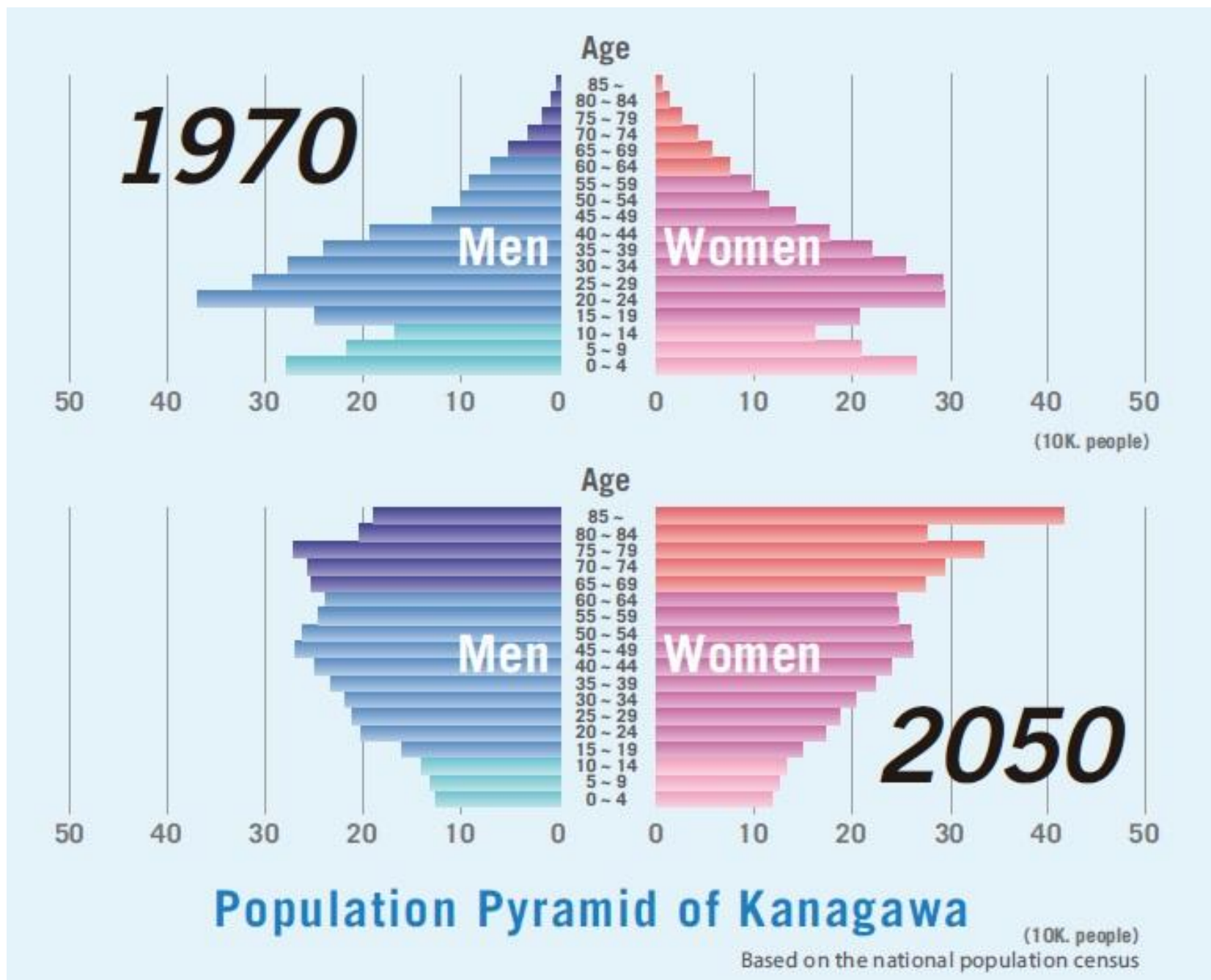
- 1) Pursuing the most advanced medical technology
- 2) “Curing ME-BYO” the scope of which is something broader than that of “disease prevention” in the context of Western medicine. Combining this concept with the utilization of advanced medical treatment / information technology, we aim to achieve healthy longevity of the citizens and to create new markets and industries at the same time. The Kanagawa Prefectural Government continues to work closely with WHO on the matter of age-friendly cities.

## Industry for Healthcare Robotics

Healthcare robotics will play an essential role in addressing various issues of aging. This technology is used not only in medical treatments, but also in support of frail seniors and people with disabilities who need daily and long-term care. Robotics also supports healthcare workers who aid such people. Japan is advanced in this field, and HCNF initiatives are utilizing this strength to build a new system of care and support.

### Examples of Robotics Use in Kanagawa Center for the Promotion of Care Robot









## ***Problems Arising from Changes in Population Structure***

*The current social (welfare) system with the working generation supporting elderly citizens will not be sustainable with the unprecedented changes in social structure demonstrated by the change in the population pyramid.*

## ***Dual Approaches to Solve the Problem***

*Kanagawa Prefecture will promote the HCNF Policy in order to address the problem. HCNF Policy consists of two approaches, a) pursuing cutting-edge medical treatments and technologies, and b) curing ME-BYO.*



## Industry for Healthcare Robotics

Healthcare robotics will play an essential role in addressing various issues of aging. This technology is used not only in medical treatments, but also in support of frail seniors and people with disabilities who need daily and long-term care. Robotics also supports healthcare workers who aid such people. Japan is advanced in this field, and HCNF initiatives are utilizing this strength to build a new system of care and support.

### Examples of Robotics Use in Kanagawa Center for the Promotion of Care Robot





# United States of America

*Economic Giant with a Strong Scientific Base,  
the Federal Government Demands Integrated  
Ageing Strategies from All its Member States*





# Summary of United States Federal Government Involvement in Longevity Initiatives

- The Federal Government's most integrated strategy on aging is the 1965 Older Americans Act, which has created a large number of State Units on Aging. These in turn have been largely responsible for each US state's individual initiatives
- The Community Innovations for Ageing in Place Initiative (CIAIP) was authorized by Congress in the 2006 reauthorization of the Older Americans Act (OAA) and funded from 2009 to 2012 by the United States Administration on Ageing (AoA).
- The US is no stranger to geroscience initiatives. The National Institute of Health (NIH) has a geroscience initiative, supporting the conducting of genetic, biological, clinical, behavioral, social, and economic research related to the ageing process. It is published in a document titled Ageing Well in the 21st Century.
- In 2019 the bill to create an Alzheimer's public health infrastructure across the country was passed. Bill to create an Alzheimer's public health infrastructure across the country to implement effective Alzheimer's interventions focused on public health issues such as increasing early detection and diagnosis, reducing risk and preventing avoidable hospitalizations.
- **But** there is little evidence of any geroscience initiatives emerging from the State Units on Aging. That is, no integrated national geroscience development plan.



1965

**State Plan on Ageing (Older Americans Act)**

It created the National Ageing Network comprising the Administration on Ageing on the federal level, State Units on Ageing, and Area Agencies on Ageing at the local level. These State-level agencies are providing noteworthy government plans on ageing to this day.



2009

**2009 - CIAIP (USA)**

The Community Innovations for Ageing in Place Initiative (CIAIP) was authorized by Congress in the 2006 reauthorization of the Older Americans Act (OAA) and funded from 2009 to 2012 by the United States Administration on Ageing (AoA).



2010

**2010 - Affordable Care Act (elderly services)**

The Patient Protection and Affordable Care Act, often shortened to the Affordable Care Act or nicknamed Obamacare, is a United States federal statute enacted by the 111th United States Congress and signed into law by President Barack Obama on March 23, 2010



2017

**2017 - NIH National Institute on Ageing: Ageing Well in the 21st Century**

NIH publishes a strategic document for supporting and conducting genetic, biological, clinical, behavioral, social, and economic research related to the ageing process



National Institute  
on Aging

2012

**2019 - The Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act**

Bill to create an Alzheimer's public health infrastructure across the country to implement effective Alzheimer's interventions focused on public health issues such as increasing early detection and diagnosis, reducing risk and preventing avoidable hospitalizations





Life Expectancy	Both sexes life expectancy (2019)	79.4 years
	Male life expectancy (2018)	77.0 years
	Female life expectancy (2018)	81.9 years
GDP	GDP per capita, current prices (2018)	64.77 thousand (\$)
	GDP per capita, PPP (2018)	64.77 thousand (\$)
	GDP, current prices (2018)	21 340 billion (\$)
Population Ageing	Rate of population ageing	3 (2007-2017)
	Aged over 65 (2018)	15.6%
	Age dependency ratio (2017)	23%
Healthcare Efficiency	Health expenditure (2017)	17.2% of GDP
	Health expenditure per capita (2017)	10209.4 thousand (\$)
	Healthcare efficiency score (2018)	29.6
Retirement	Total # retired	50 204 174
	Retired people proportion	15%
	Normal retirement age (Man/Woman)	66 years/66 years
	Early retirement age (Man/Woman)	62 years/62 years

## Longevity Initiatives

- Age of relevant initiatives: **55 years**
- **288** of WHO age-friendly cities and communities
- **Master Plans** on states level
- **6** initiatives focused on non-medical improvement of quality of life
- **1** initiative focused on preventive medicine and healthcare approaches
- **2** initiatives involve research or R&D of medicines that directly impact on ageing





# USA Initiatives Level of Comprehensiveness



**Financial Reform**

ACL Strategic Plan

**National Master Plan on Ageing**

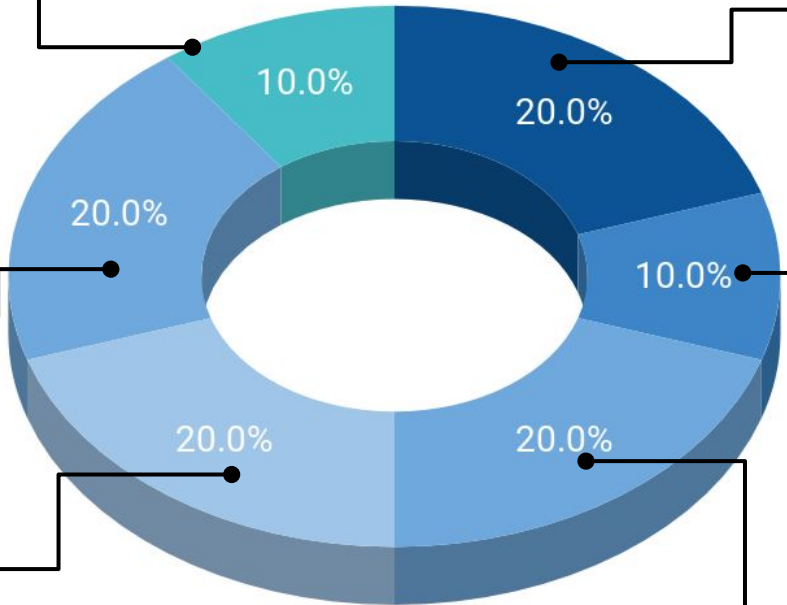
State Plan on Ageing

CIAIP

**Elderly Healthcare Vouchers**

Medicaid

Affordable Care Act



**Healthy Ageing: Lifestyle and Fitness Programs**

Healthy Ageing Program

GO4Life

**Non-medical Initiatives**

Feeding America

**Geroscience R&D**

Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act

NIH National Institute on Ageing: Ageing Well in the 21st Century

Underrepresented Initiatives

Preventive Medicine	AgeTech	Longevity Industrial Strategy	Continuing Education
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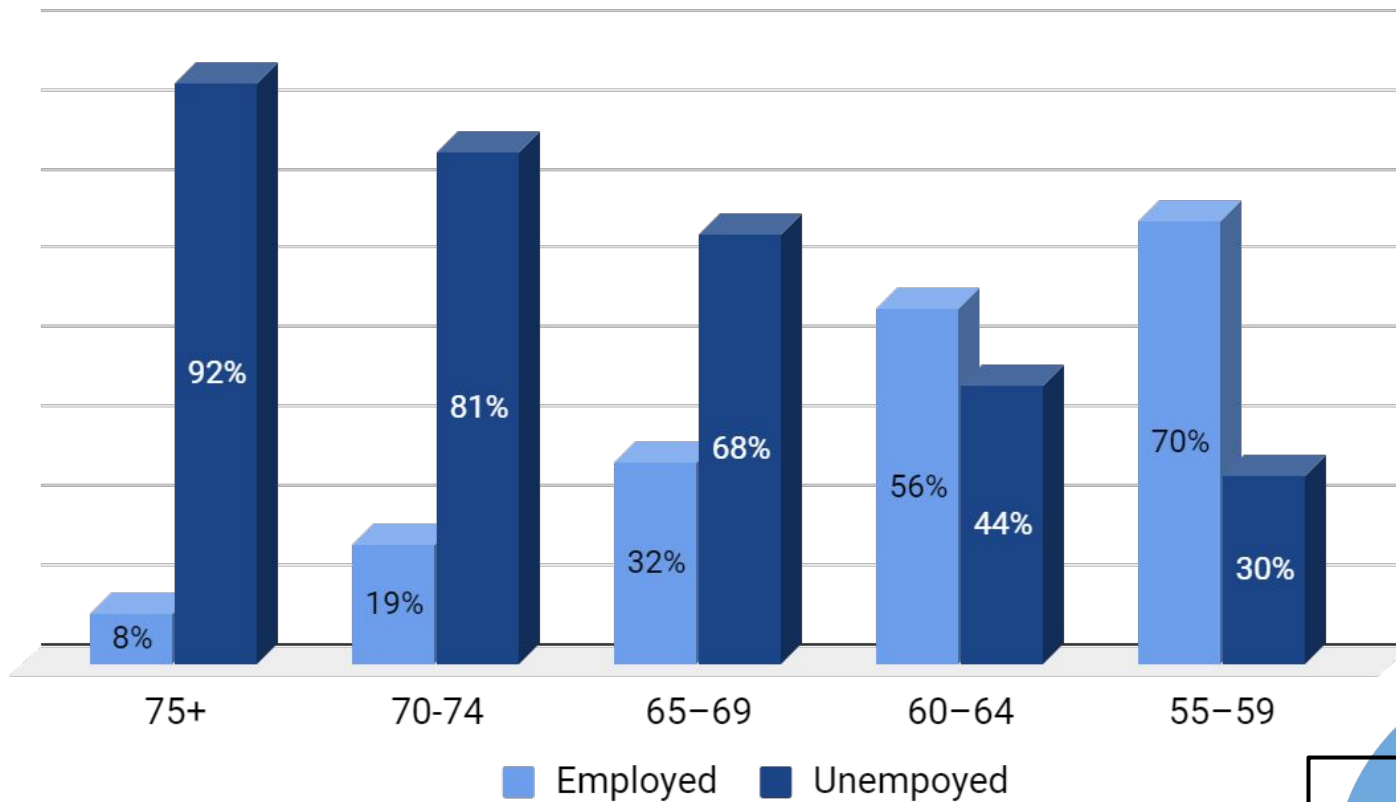


# USA Age/Employment Range



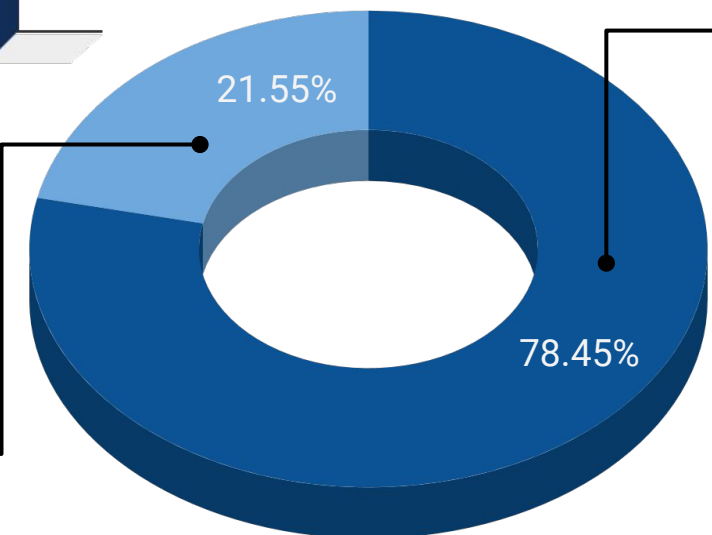
265

## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60



# Federal Plan on Ageing (Older Americans Act)

The Older Americans Act signed into law on July 14 1965.

The Act authorizes a wide array of service programs through a nationwide network of 57 state agencies on ageing and 665 area agencies on ageing, supports the sole federal job creation program benefiting low-income older workers, and is a major source of federal funding for an extensive grant program for training, research, and demonstration activities in the field of ageing. The Act has been amended 13 times since the original legislation was enacted.

It established the Administration on Ageing within the Department of Health, Education and Welfare, and called for the creation of State Units on Ageing (SUAs).

Many of these SUAs have proceeded to develop advanced state plans for ageing. One outstanding example is California's 2019 Master Plan on Ageing and Launch of Alzheimer's Task Force. Governor Gavin Newsom called for state development plan that must address "person-centered care, the patchwork of public services, social isolation, bed-locked seniors in need of transportation, the nursing shortage and demand for in-home supportive services". New Alzheimer's Prevention and Preparedness Task Force was launched



# The Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act

267



On December 31, 2018, The BOLD Infrastructure for Alzheimer's Act was introduced by Senators Susan Collins (R-Maine), Catherine Cortez Masto (D-Nev.), Shelley Moore Capito (R-W.Va.), Tim Kaine (D-Va.), and by Representatives Brett Guthrie (R-Ky.), Paul Tonko (D-N.Y.), Chris Smith (R-N.J.) and Maxine Waters (D-Calif.). Developed in close partnership between the sponsors, the Alzheimer's Association and AIM, the bill quickly developed enormous bipartisan support. More than half of the 115th Congress — 58 Senators and 256 Representatives — cosponsored the bill. The bill unanimously passed in the Senate on December 12 and passed in the House 361-3 on December 19.

## Key steps:

- Support early detection and diagnosis.
- Reduce risk of avoidable hospitalizations.
- Reduce risk of cognitive decline.
- Enhance support to meet needs of caregivers.
- Reduce health disparities.
- Support care planning and management.





# The Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act

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1. Centers of Excellence in Public Health Practice dedicated to promoting effective Alzheimer's disease and caregiving interventions as well as educating the public on Alzheimer's disease, cognitive decline, and brain health. The centers would implement the CDC's Healthy Ageing Public Health Road Map, and would take key steps to support health and social services professionals as well as families and communities. Authorizes \$12 million for centers across the nation.
2. Core Capacity and Enhanced Activity Cooperative Agreements with the CDC would be awarded to State Health Departments to carry out key steps. Core capacity awards would help states build a foundation and enhanced activity awards would help those states that are carrying out public health Alzheimer's steps to amplify their initiatives through public-private partnerships. Authorizes \$20 million.
3. Data Analysis and Reporting Cooperative Agreements with CDC would ensure that data on Alzheimer's, cognitive decline, caregiving, and health disparities are analyzed and disseminated to the public in a timely manner. Authorizes \$5 million for awards and CDC data collection





# The Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act

The NIH National Institute on Ageing's mission is to:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the ageing process, diseases and conditions associated with ageing, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in ageing.
- Provide research resources.
- Communicate information about ageing and advances in research on ageing to the scientific community, health care providers, and the public.



National Institute  
on Aging

NIA pursues this mission by funding extramural research at universities and medical centers across the United States and around the world; maintaining an active communications and outreach program; and conducting a vibrant intramural research program at NIA laboratories in Baltimore and Bethesda, Maryland.

NIH has published a strategic document for supporting support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the ageing process. The document outlines the broad strategic directions of the Institute. It provides a point of reference for setting priorities and a framework for systematically analyzing the Institute's scientific portfolio and assessing progress. NIA developed and refined these goals over a period of approximately one year, in close consultation with stakeholders in the research community, non-governmental organizations, partners within the NIH and elsewhere within the federal government, and members of the general public.



The document's goals are as follows:

## **Understanding the Dynamics of the Ageing Process**

**Goal A:** Better understand the biology of ageing and its impact on the prevention, progression, and prognosis of disease and disability.

**Goal B:** Better understand the effects of personal, interpersonal, and societal factors on ageing, including the mechanisms through which these factors exert their effects.

**Goal C:** Develop effective interventions to maintain health, well-being, and function and prevent or reduce the burden of age-related diseases, disorders, and disabilities.

**Goal D:** Improve our understanding of the ageing brain, Alzheimer's disease, and other neurodegenerative diseases. Develop interventions to address Alzheimer's and other age-related neurological conditions.

**Goal E:** Improve our understanding of the consequences of an ageing society to inform intervention development and policy decisions.

**Goal F:** Understand health differences and develop strategies to improve the health status of older adults in diverse populations.

## **Supporting the Research Enterprise**

**Goal G:** Support the infrastructure and resources needed to promote high-quality research.

**Goal H:** Disseminate information to the public, medical and scientific communities, and policymakers about research and interventions.



# Spain

***Elderly Population Twice the Age of its  
Democratic Institutions, Rapidly Producing  
Piverse Programs***



# Summary of Relevant Government-Led Longevity Initiatives in Spain

- In Spain some incentives for government initiatives are reduced: elderly little need for winter fuel and many live out their final days in care of family.
- Spanish Government Raised Retirement Age to 67 in 2011
- Low-wage workers are protected by a minimum retirement benefit, which is partially financed by direct government transfers. There is also a basic non-contributory welfare scheme for the elderly, financed out of general government revenues.
- Immigrants pay contributions but will not receive benefits.
- There are living centers that provide which improve the lives of dependent elderly people and people with disabilities, also providing active and healthy ageing.
- National Health System frameworks for health promotion and primary prevention cycle of life are created.
- In 2012 a system that provides care for people with problems of temporal and spatial orientation, and support for their carers is created.



- 2001 — **Tarjeta Junta 65 launched**  
Used for a period of 5 years. Its renewal is also free. With this card elderly people can enjoy of services and benefits in a very quickly and easy way: discounts, grants, access to programmes, etc.
- 2002 — **Spain hosts Madrid Plan of Action (United Nations)**  
Its implementation changed attitudes, policies, and practices at all levels in all sectors so that the enormous potential of ageing.
- 2007 — **Independent Living Centres for dependent elderly (CVI) scheme introduced**  
Living centers are introduced which provide for the dependent elderly people and people with disabilities, making possible active and healthy ageing.
- 2011 — **Spanish Government Raised Retirement Age to 67**
- 2012 — **Ezaintza is created**  
A system that provides care for people with problems of temporal and spatial orientation, and support for their carers is created.
- 2017 — **National Health System frameworks for health promotion and primary prevention cycle of life are created.**  
Spanish NHS proposes the progressive development of interventions aimed at improving health and preventing diseases, injuries and disability.







Life Expectancy	Both sexes life expectancy (2019)	81.9 years
	Male life expectancy (2018)	80.3 years
	Female life expectancy (2018)	85.7 years
GDP	GDP per capita, current prices (2018)	30.63 thousand (\$)
	GDP per capita, PPP (2018)	41.54 thousand (\$)
	GDP, current prices (2018)	1 430 billion (\$)
Population Ageing	Rate of population ageing	2.5 (2007-2017)
	Aged over 65 (2018)	18.15%
	Age dependency ratio (2017)	30%
Healthcare Efficiency	Health expenditure (2017)	8.8% of GDP
	Health expenditure per capita (2017)	3.371 thousand (\$)
	Healthcare efficiency score (2018)	69.3
Retirement	Total # retired	9 051 928
	Retired people proportion	19%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	60 years / 60 years

## Longevity Initiatives

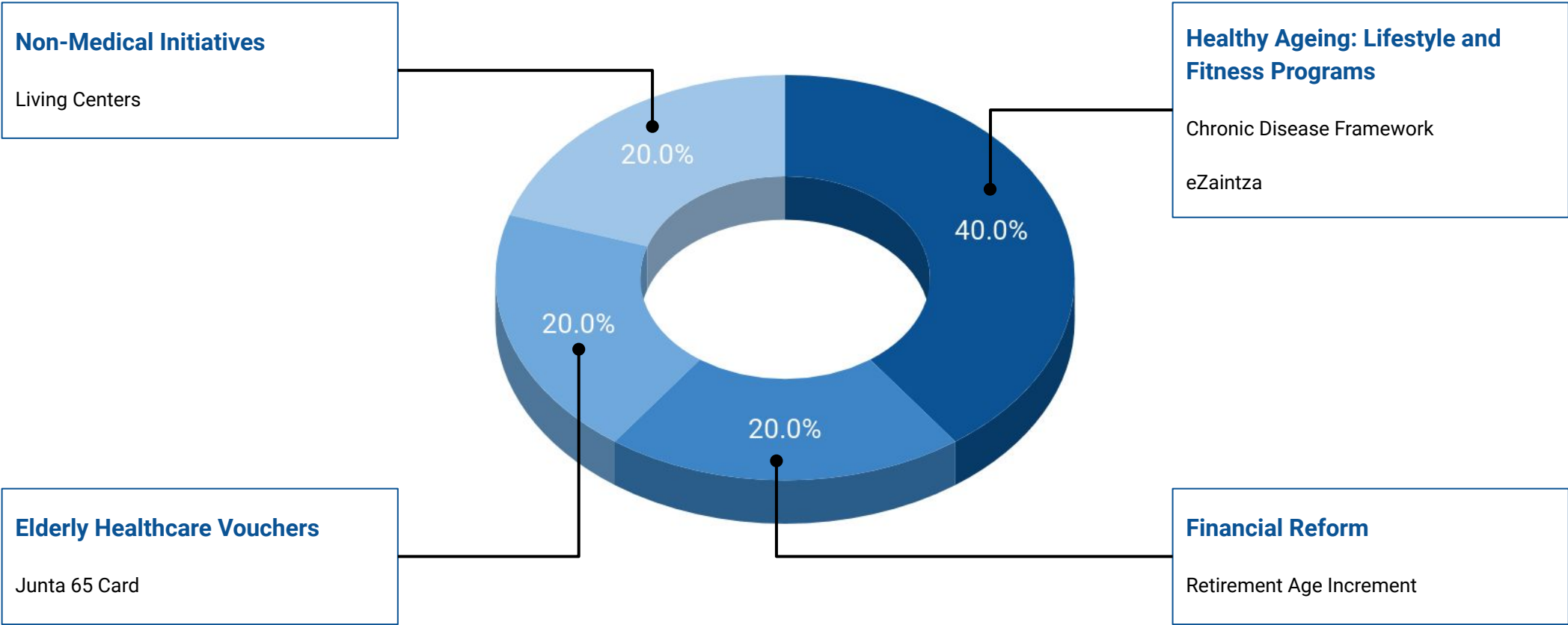
- Age of relevant initiatives: **18 years**
- **162** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life



# Spain Initiatives Level of Comprehensiveness



275



## Underrepresented Initiatives

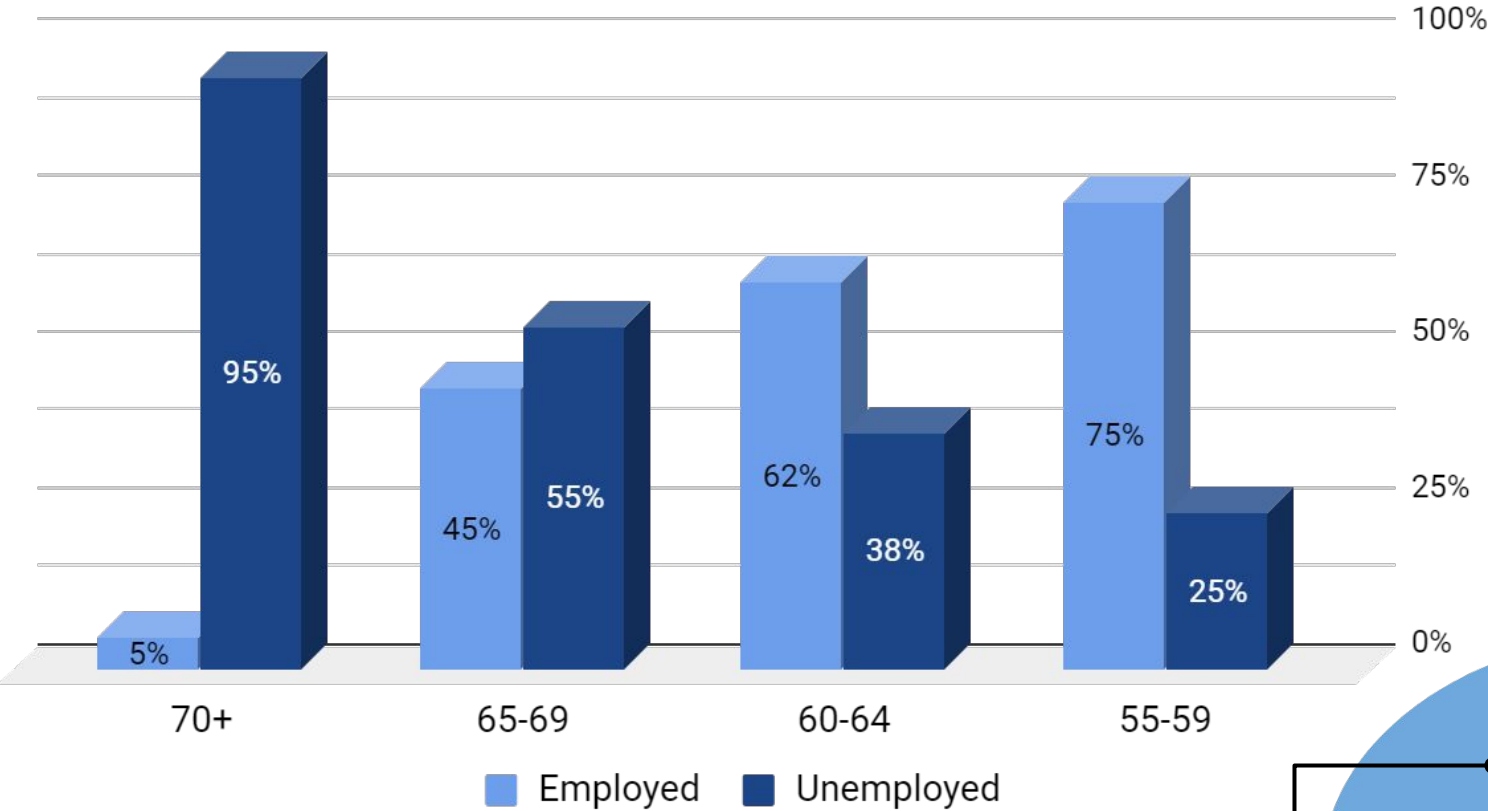
Preventive Medicine	Geroscience R&D	Longevity Industrial Strategy	AgeTech	National Master Plan on Ageing	Continuing Education
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# Spain Age/Employment Range

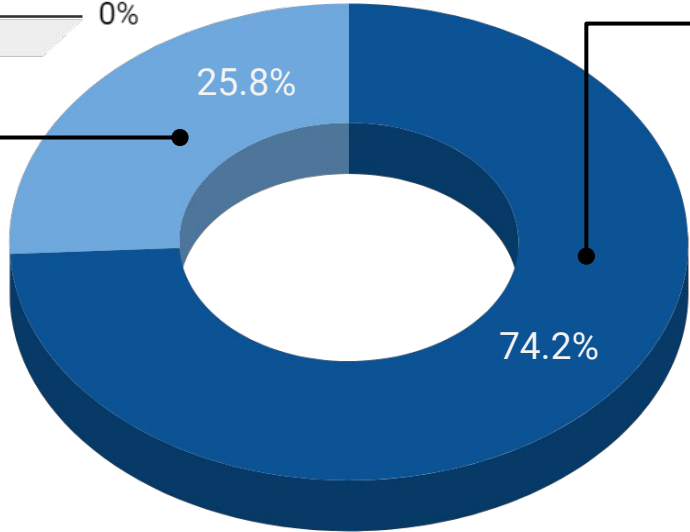


Fraction of the Unemployed by Age



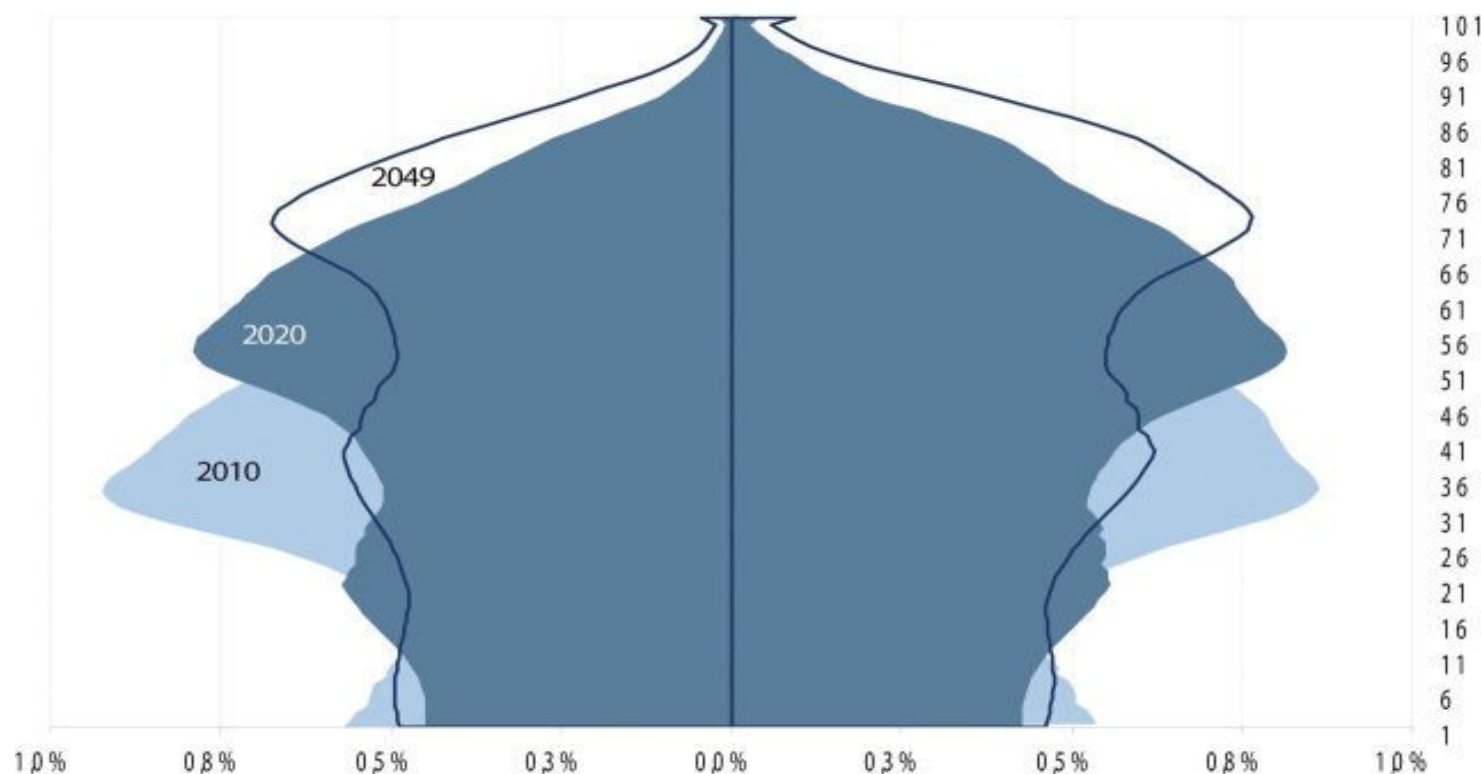
Percent of people under 60

Percent of people over 60



Future predictions indicate that by 2050 there will be 16 million older adults, which corresponds to nearly one third of the total population (INE, 2012a). The challenges of the ageing process will have an impact on systems of social protection, public financing of services, the economic structure (investment, savings, consumption), and family finances. Responding to the challenge posed by ageing implies restructuring policies, economic systems, and social and family relations.

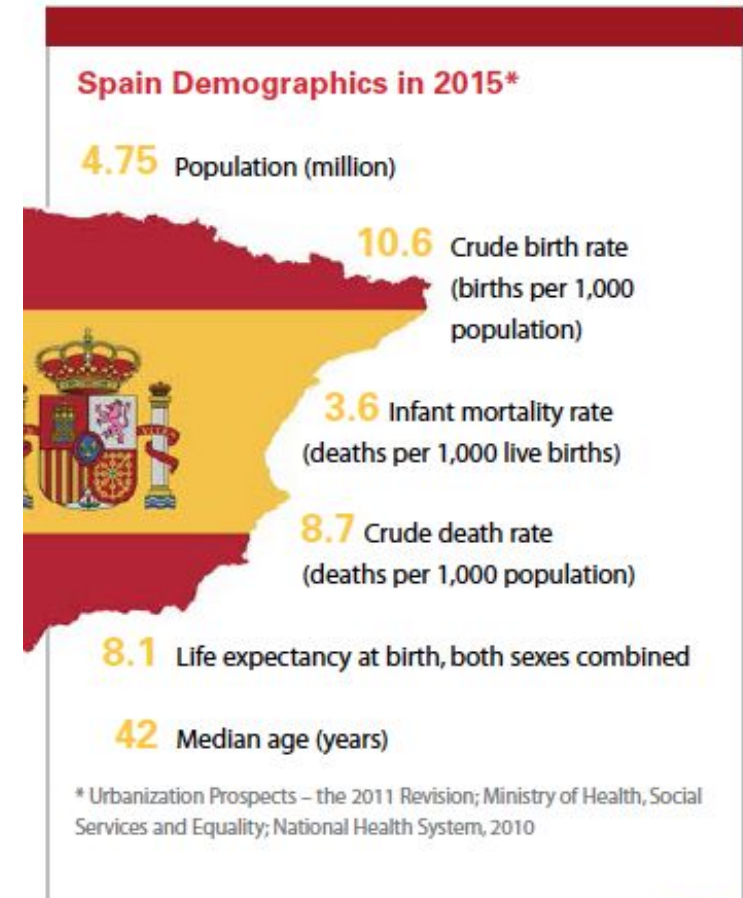
Spain has seen significant societal changes in the 21st century, contributing to its ageing population, in particular, high life expectancy coupled with low fertility, which will result in a doubling of the old-age dependency ratio. Demographic ageing implies important challenges that affect the lives of people, families, the economy, public finances, and the reorganization of the health and social systems. Currently, the older population has become particularly vulnerable due to the economic crisis taking place in Spain, which has brought about the need for new policies and systems to protect older persons. The pension system is under the greatest threat in conjunction with possible changes in the national health care system.



Two factors are now particularly salient in Spain: how the population structure affects the dependency ratio, and the consequences of the current economic crisis for the public pension system and national health care. Governments must handle social welfare programs for older adults (pensions and health care and long term) and appropriately manage income via taxes and contributions and expenses, without forgetting other large parts of social welfare programs that affect other age groups, for example, education and unemployment. Spain's old-age dependency ratio at present places it after Germany and Italy in Europe, and also behind Japan, which currently has the highest dependency ratio in the world.

The Madrid International Plan of Action on Ageing (MIPAA) unanimously approved the essential principles that should guide plans of action when handling the challenges of ageing in the Second World Assembly on Ageing of the United Nations. The United Nations (1991) Principles for Older Persons include independence, participation, care, self-sufficiency, and dignity. Building on these principles, the year 2012 was declared as the European Year for Active Ageing and Solidarity between Generations, with

IMSERSO taking the lead for Spain. Goals included sensitizing the public to the valuable contribution that older people make to society and the economy; promoting active ageing and intergenerational solidarity; respecting the potential of all older people, regardless of their origin; combating age discrimination; and overcoming age-related stereotypes. To be able to offer the possibility of complying with these principles and goals, there is a demand for all public institutions, such as the state government, various non-governmental organizations, academic institutions, and the private sector, to tackle the current challenges in a way that builds a secure future.

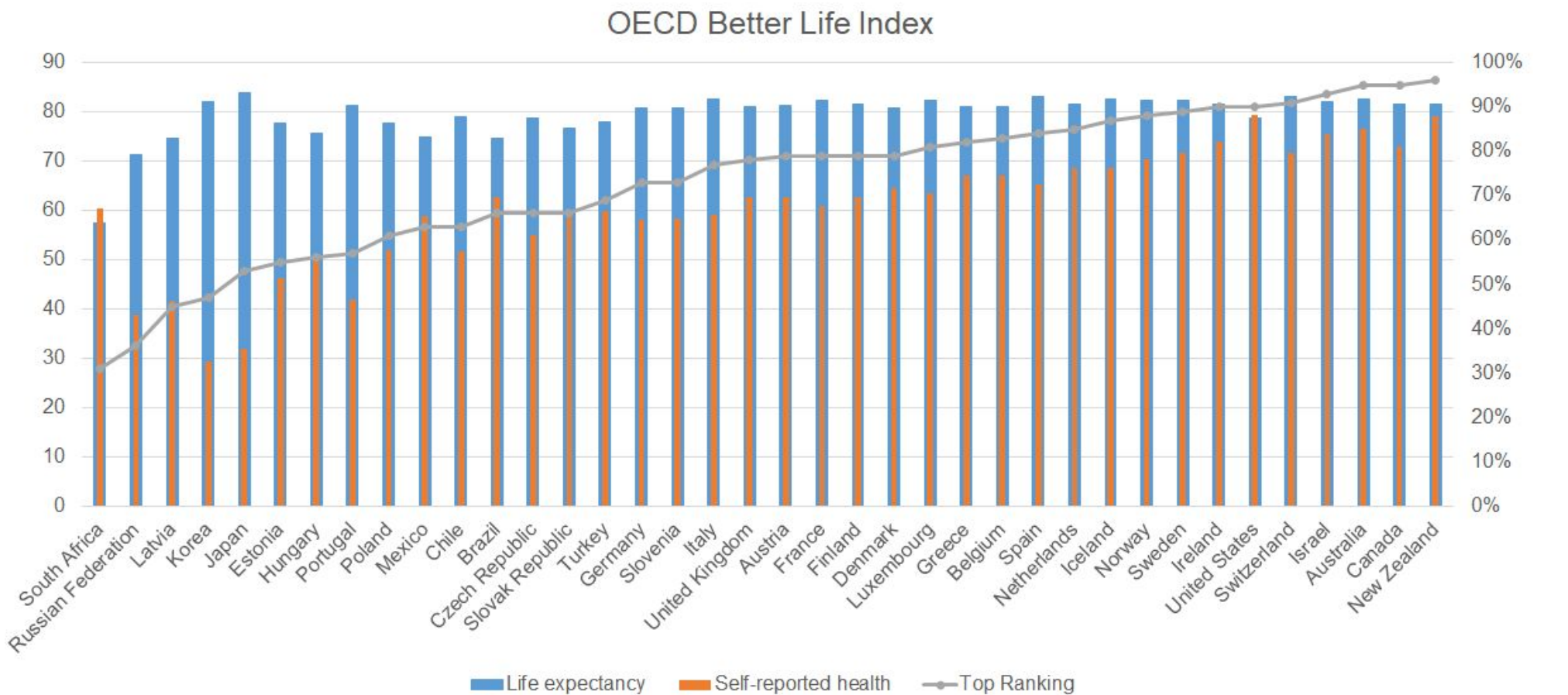






According to the OECD Better Life Index made in 2017. Spain enjoys one of the highest life expectancies among OECD countries at 83 years, three years above the OECD average of 80 years, and one of the highest in the OECD. Higher life expectancy is generally associated with higher health care spending per person, although many other factors have an impact on life expectancy (such as living standards, lifestyles, education, and environmental factors).

When asked, "How is your health in general?" 72% of people in Spain reported being in good health, more than the OECD average of 69%.



In 2011 the government of Spain raised the retirement age as part of an overhaul of the country's pensions system, averting threatened organized protests and responding to investors who have been demanding that Spain clean up its public finances.

After a year of negotiations, the draft deal ensures that Spain's normal retirement age will rise to 67 from 65. As part of a compromise, however, the government agreed that workers could retire at 65 if they had contributed to the state pensions system for at least 38.5 years. The agreement is also intended to cut the cost of future pension payments by basing the calculation for such payments on a worker's last 25 years of earnings, rather than the 15 years under current law.

Under pressure from investors to speed up structural reforms to the economy, José Luis Rodríguez Zapatero, Spain's prime minister, had set Friday as a deadline to reach agreement on changing the pension system. He had insisted that the government would in any case impose such an overhaul by decree if no deal had been reached by that date.

Union leaders, however, had warned that they would call the country's second general strike in less than six months if the government changed the pension system without their backing.

*"What was promised has been fulfilled and this raises the government's credibility."* said Pablo Vázquez, an economist at the Fundación de Estudios de Economía Aplicada, a Madrid-based research institute. *"It also comes with a union agreement and hence without the social conflict seen in other countries."*

Pension reform had been a political hot potato in several European countries, including France, which was hit last autumn by a nationwide strike and protest movement before the government won support in Parliament for its plan to raise the minimum retirement age to 62 from 60. Similarly, Greece was the scene of serious unrest after its government also agreed last June to radical changes to its retirement program — including cuts in benefits and curbs on early retirement — as part of changes promised by Athens in return for a €110 billion, or \$150 billion, bailout.

Traditionally there has been a reliance on family members to provide informal unpaid care. The ageing of the population, coupled with changing family structures, has raised the issue of long-term care up to the policy agenda. A new law, the right to long-term care services, funded through taxation but to means testing has now come into effect. While increasing public coverage for long-term care services, this new legislation raises challenges in respect of coordination and delivery of services within and across the seventeen Autonomous Communities that are responsible for the provision of social care services.

While some countries, including Germany, finance LTC through social insurance, Spain has opted for a tax-funded approach, consistent with its tax-funded health care system. An initial budget of €12.638 billion has been set aside for the 'National LongTerm Care System' that commenced operations in 2007. The system will be implemented in stages, with the aim of full operation by 2015.

## Estimated number of future dependents by level of dependency

	2005	2010	2015	2020
Category Three (Severe Dependency)	194,508	223,457	252,345	277,884
Category Two (Moderate Dependency)	370,603	420,336	472,461	521,065
Category One (Mild Dependency)	560,080	602,636	648,442	697,277
Total	1,125,190	1,246,429	1,373,248	1,496,226

Alongside the new funding, the government has introduced a “universal, but subjective” right to LTC. The scheme can also apply to younger people who have LTC needs, for example, those with early onset dementia. Individuals are guaranteed access to a package of care services (subject to some cost sharing), regardless of the place of residence, if they are deemed eligible following an assessment of care needs, income, and financial assets.

Assistance can take the form both of formal service provision, such as home helps, access to day and long term residential care, and/or cash payments to assist family carers. The system is expected to initially cover 1.125 million people (Table 2), 80% of whom will be over the age of 65.6 Little change is predicted in the balance between different levels of need between 2005 and 2020, although the total number of individuals receiving support is projected to increase by one third to almost 1.5 million.

## Estimated central state allocation to the new long-term care system

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Funding (€ millions)	400	679	979	1160	1545	1674	1876	2112	2212	12638



This service aims to assist dependent elderly people or those with disabilities by providing them with personalized technology and products which will increase their quality of life, autonomy and security in the home. It tailors the solutions to both the individual needs of the patient as well as the specific conditions of their home to provide effective, efficient and helpful benefits to these people's lives.

- The CVI was established in 2007 and works in three different areas in order to improve the lives of dependent elderly people or people with disabilities: direct assistance, teaching, and research.
- Direct assistance: the CVI will evaluate each person's needs through visits to CVI, visits at the home and training visits to teach people on the technology they can get in their homes. After evaluation, the CVI will make adaptations to the patient's house and provide products which are suited for the patient, as well as working with the caregiver if they are highly dependent. Ongoing monitoring is used to adapt the offered services if there are changes in their needs.
- Teaching: the CVI offers lectures and workshops on different aspects of their services and best practices as are relevant for the target audience, which can be: professionals, carers, relatives, or educational establishments.
- Research: the centre also conducts research on creating new products and adapting existing technologies for use in their service, so that they can provide the highest quality, proven products for their patients

These centres have the potential to improve the condition of the patient and increase their autonomy, relieving pressure on informal carers and the health care system. In some cases, the solutions may be cost-effective compared to having a carer perform/aid with the tasks instead performed by the ICT offered by the CVI.





# The Prevention and Health Promotion Strategy of the Spanish NHS: Framework for Addressing Chronic Disease in the Spanish NHS

The Prevention and Health Promotion Strategy of the Spanish NHS proposes the progressive development of interventions aimed at improving health and preventing diseases, injuries and disability. It is an initiative developed within the framework of the Plan for the Implementation of the Strategy for Addressing Chronic Disease across the Spanish National Health System (NHS). The Strategy has a life-cycle approach, with two populations prioritized: children (under 15) and individuals over the age of 50.

The Strategy seeks to facilitate a common framework for health promotion and primary prevention in the cycle of life, harmonising its integration in the portfolio of services of the National Health System and getting other sectors of society actively involved, promoting participation of individuals and population in order to raise their autonomy and capacity to have a greater control over their own health. The Strategy outlines interventions related to prevention and health promotion. Interventions in the elderly population include:

- Comprehensive counselling about lifestyles in Primary Healthcare linked to community resources in the over-50 age group of the population;
- Frailty screening and multi-factor attention for the elderly, which will lead to plans of preventive intervention and individualised monitoring in line with the action plans by the European Innovation Partnership for Active and Healthy Ageing (EIP-AHA).

The first phase started in 2014. The first evaluation was made in 2016. The objectives of the Strategy include:

- Promoting the population's health and wellbeing by fostering healthy environments and lifestyles and strengthening safety in order to prevent injuries;
- Increasing life expectancy in good health by two years, for those born in Spain (set out as a quantifiable global objective for 2020).
- Encouraging active and healthy ageing in the population aged over 50 years old, through the comprehensive integration of healthy life-styles and safe behaviours in a coordinated manner between healthcare and family community fields.
- Preventing functional impairment, promoting health and emotional wellbeing in the population aged over 70 years old, fostering the coordination of comprehensive interventions in the health care, social services and community fields.



eZaintza is a system that provides care for people with problems of temporal and spatial orientation, and support for their carers, created in 2012. Its aim is to improve self-esteem, confidence, wellbeing and ultimately the autonomy of people, in addition to improving social and medical intervention in prevention and care. It can be used in a family environment, or can be a work tool for professional carers, and can even be connected with telecare services.

On the website the caregiver can define some paths and zones in order to control the user's location. This is done using interactive maps. There are several map providers, but the one selected is OSM (OpenStreetMap), because this website contains open source maps with a large community updating the maps every day. The caregivers, who monitor the users and add the paths and zones to the system, also create events in the calendar. The user must use a smartphone in order to install the mobile application. The first approach includes the Android version of the application. This application is a lightweight programme that only sends the user's coordinates and receives messages from the server. End users will usually be elderly people, since they tend to experience more disorientation problems. It is designed to ensure usability. When the user exits their secure path/zone or enters a dangerous zone, a similar message is shown automatically, sent by the smartphone itself. The user is asked whether they are OK. The phone automatically starts calling the caregiver and sends an alarm if the "no" button is pressed. The outcome of the project is very satisfactory as it allows elderly people and their family members to feel more secure and lead their daily lives more independently. The Project is assisted by Osatek and BetiOn, who are in charge of teleassistance in the Basque Country.

The Project has the following impact:

- Housing: increase the number of older people living independently.
- Social participation: increase the number of older people who are socially active.
- Increase in security and well-being of older people and his/her caregiver.





The Junta 65 Card is a free document that is at the disposal of people over 65 years old provided by the Regional Ministry of Equality and Social Policies of the Government of Andalusia, through the Agency of Social Services and Dependency of Andalusia. It is an ITC tool, provided with chip and magnetic stripe, about the services for elderly people, with no more formality job. With this card elderly people can enjoy of services and benefits in a very quickly and easy way: discounts, grants, access to programmes, etc.

It was created in 2001 and it's used for a period of 5 years. Its renovation is also free. With this card elderly people can enjoy of services and benefits in a very quickly and easy way: discounts, grants, access to programmes, etc. Between these services the cardholders have a discount of a 50% in the public interurban transports of general and permanent use, with origin and destination inside the Andalusia Region, that are provided by the companies that have signed an agreement with the Agency of Social Services and Dependency of Andalusia. Other services provided by the Junta 65 Card are in relation with the Tele-assistance Service in Andalusia, discounts in optical goods and hearing aids, legal advice service, dining service, etc.

- Social participation: increase the number of older people who are socially active
- Community support and health services: increase in client-oriented and -centered made to measure health and social care and services
- Transportation: increase in transport suitable for older people
- It fosters and promotes the business sector, so it is a tool that have a very positive economical impact.
- It fosters the promotion of the personal autonomy and the prevention of the dependency.



This project aims to provide a framework for the participatory involvement in municipal decision making in the Spanish city of Durango.

The aim is to improve the environment and facilitate active and healthy ageing.

This objective will be achieved by following the age-friendly "checklist" approach taken by the World Health Organization. The checklist is evaluated through eight sections, fulfilling a city with friendly city features.

There are four phases to the project:

- Creating mechanisms for the participation of older people in the cycle of the network. Initial evaluation of the adaptation of the city to the elderly. Formulation of a three-year action plan for the entire city, based on the results of that evaluation. Identification of indicators for monitoring progress.
- Presentation of an action plan to the WHO. Agreement of the plan. A deadline of three years to implement the plan.
- Evaluation of progress. Progress reports.
- Continuous Improvement if there is convincing evidence that progress on the initial action plan has been made.

Impact:

- Greater participation in municipal decision making by older people, and a more age-friendly environment.



**Ciudad amigable con  
las personas mayores**



The background of the slide is a blue European Union flag with its characteristic twelve gold stars arranged in a circle. A thick, gold-colored frame with a stylized, angular design surrounds the central text area.

# European Union

***Continental Coordinating Power, Clear Interest in  
Fostering International Research Cooperation  
and Setting Standards***

- Is a large multinational organisation with the necessary constitution and structure well suited to coordinating international research initiatives.
- But in fact intervention is relatively fragmentary and does not take full advantage of this infrastructure.

There have nonetheless been some bold, high-level initiatives:

- **D4 AG Action Group** is comprised of local and regional authorities from across the EU, European NGOs, technology providers, research centres, and SMEs. The Action Group seeks to devise strategies for adapting EU environments to suit the needs of the ageing population.
- **Horizon 2020**  
Biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years.
- **ACPA – Adapting European Cities to Population Ageing: Policy Challenges and Best Practices**  
ESPON ACPA will investigate the effectiveness of policies and initiatives to develop age-friendly cities and initiatives that support “ageing in place” in eight cities and city-regions. ACPA’s results will directly feed into the adaptation and development of policies and action plans related to age-friendly cities and social programmes including post-2020 cohesion policy.



2014

**Horizon 2020**

Biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years.



2016

**D4 AG**

Action Group is comprised of local and regional authorities from across the EU, European NGOs, technology providers, research centres, and SMEs. The Action Group seeks to devise strategies for adapting EU environments to suit the needs of the ageing population.



2016

**The Commission adopts ex-post evaluation of FP7: the future of European Union research policy**

Includes support for research into the process of healthy ageing and age-related illnesses, biomedical advances, as well as prevention and disease management strategies.



2019

**ACPA – Adapting European Cities to Population Ageing: Policy Challenges and Best Practices**

ESPON ACPA will investigate the effectiveness of policies and initiatives to develop age-friendly cities and initiatives that support “ageing in place” in eight cities and city-regions. ACPA’s results will directly feed into the adaptation and development of policies and action plans related to age-friendly cities and social programmes including post-2020 cohesion policy.





Life Expectancy	Both sexes life expectancy (2019)	78.5 years
	Male life expectancy (2018)	75 years
	Female life expectancy (2018)	82 years
GDP	GDP per capita, current prices (2018)	36.54 thousand (\$)
	GDP per capita, PPP (2018)	44.47 thousand (\$)
	GDP, current prices (2018)	18 710.0 billion (\$)
Population Ageing	Rate of population ageing	2.4 (2007-2017)
	Aged over 65 (2018)	19.0%
	Age dependency ratio (2017)	30%
Healthcare Efficiency	Health expenditure (2017)	7.0% of GDP
	Health expenditure per capita (2017)	3.927 thousand (\$)
Retirement	Total # retired	69 960 901
	Retired people proportion	20%

## Longevity Initiatives

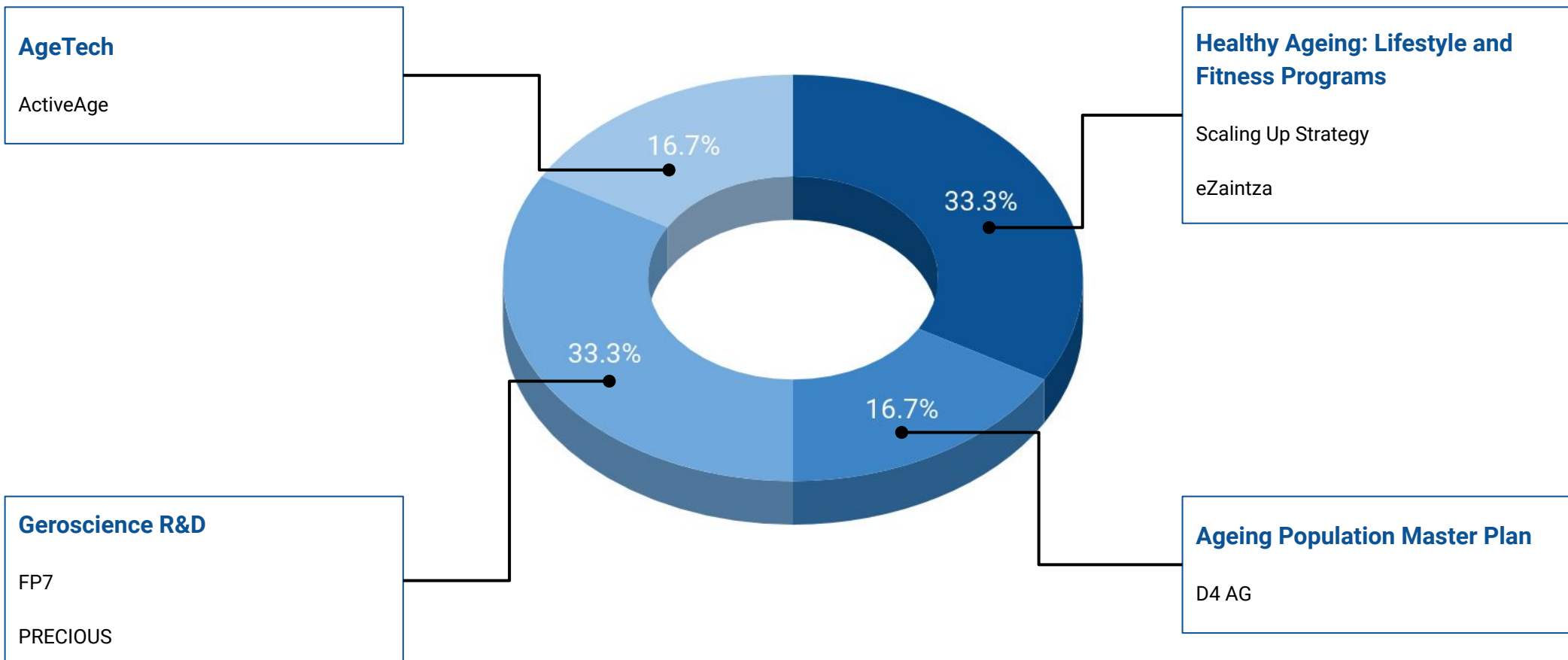


- **319** of WHO age-friendly cities and communities
- **Master Plan on Ageing**
- **4** initiatives focused on non-medical improvement of quality of life
- **2** initiatives involve research or R&D of medicines that directly impact on ageing

# European Union Initiatives Level of Comprehensiveness



293



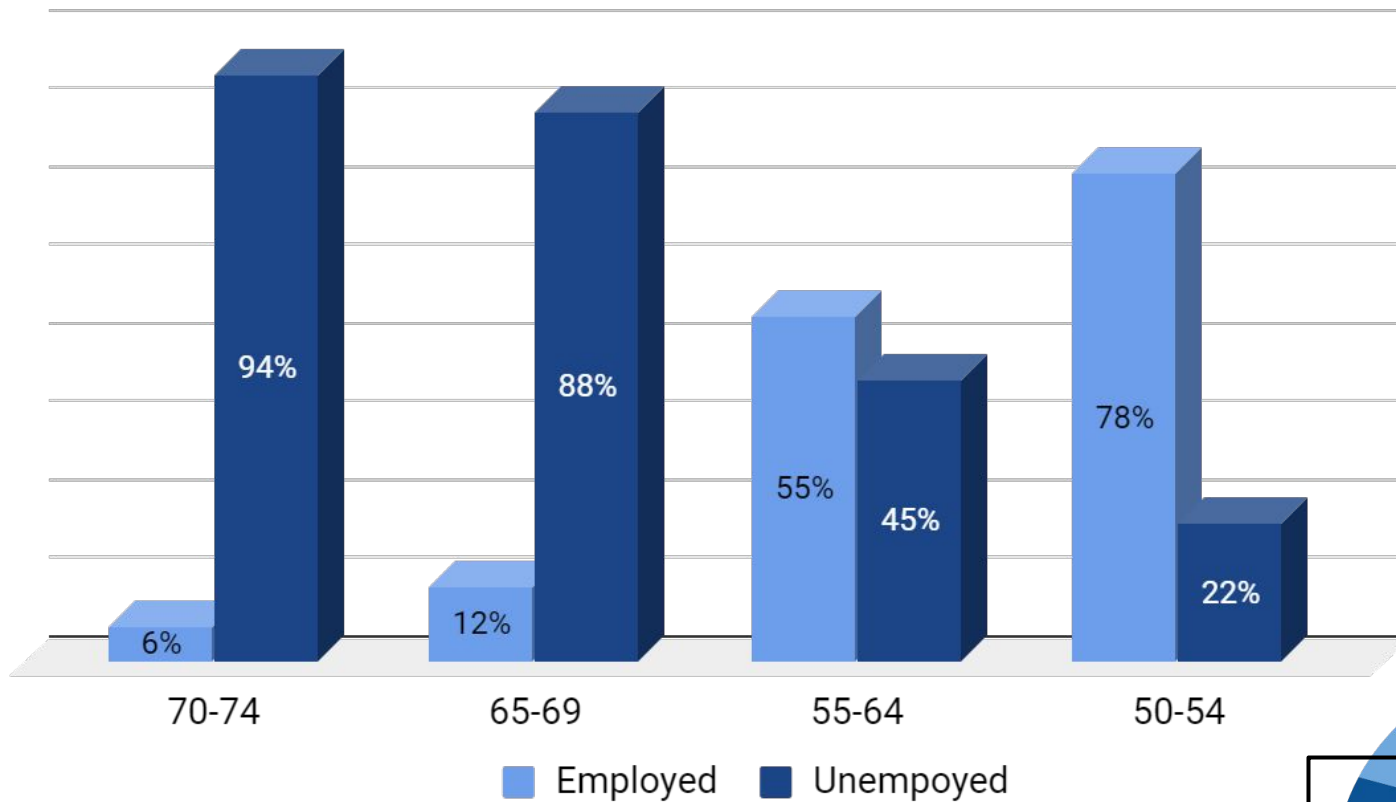
## Underrepresented Initiatives

Preventive Medicine	Healthy Ageing: Lifestyle and Fitness Programs	Longevity Industrial Strategy	Elderly Healthcare Vouchers	Non-Medical Initiatives	Continuing Education
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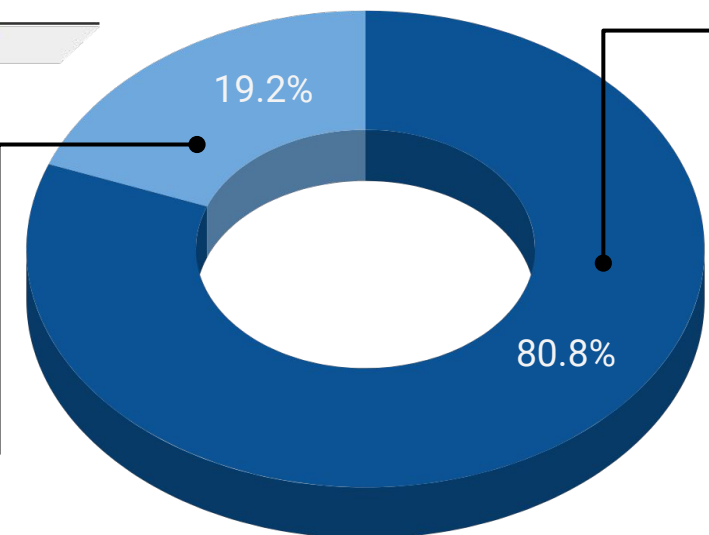


## Fraction of the Unemployed by Age



Percent of people under 60

Percent of people over 60






Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.

Seen as a means to drive economic growth and create jobs, Horizon 2020 has the political backing of Europe's leaders and the Members of the European Parliament. They agreed that research is an investment in our future and so put it at the heart of the EU's blueprint for smart, sustainable and inclusive growth and jobs.

Reducing or containing these costs so that they do not become unsustainable depends partly on improving the lifelong health and well-being of all and therefore on the effective prevention, treatment and management of disease and disability.

The programme calls for:

- Improvement to our understanding of the causes and mechanisms underlying health, healthy ageing and disease;
- Improvement to our ability to monitor health and to prevent, detect, treat and manage disease;
- Support for older persons to remain active and healthy;
- Test and demonstration of new models and tools for health and care delivery.




## Horizon 2020


# HEALTH

### research and innovation funding

**An investment in better health for all**

Horizon 2020 is the EU's research and innovation funding programme





**15 funding channels**

**more than 10 billion**  
2014-2020

**to meet specific health research and innovation needs**  
Includes support for individual grants and fellowships, SMEs, large collaborative public-private consortia

**5 AREAS**

**COLLABORATIVE RESEARCH**  
Support multidisciplinary and cross-sector research on health and care for generating and translating new knowledge into applications and benefits for the society

**BLUE SKY RESEARCH**  
Reinforce and extend the excellence of the EU's science base (including in life sciences and health-related research)

**INNOVATIVE HEALTH AND CARE INDUSTRY**  
Translate innovation into practical health and care applications benefiting citizens, healthcare systems and businesses


**INFRASTRUCTURES**  
Support facilities, resources and services used by the science community to conduct research and foster innovation (including in the health area)

**WORKING WITH MEMBER STATES AND INTERNATIONAL PARTNERS**  
Foster European and global coordination in health and disease research


**PARTICIPATION**



single




multiple




any country in the world


**FUNDING**



based in EU Member States



based in countries associated to Horizon 2020:  
Iceland, Norway, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Israel, Moldova, Switzerland, Faroe Islands, Ukraine, Tunisia, Georgia, Armenia



based in most countries in the world (all low-income countries and the US, but excluding Russia, China, India, Brazil and Mexico, and high-income countries)

*This is an overview. Details and conditions apply case by case.*



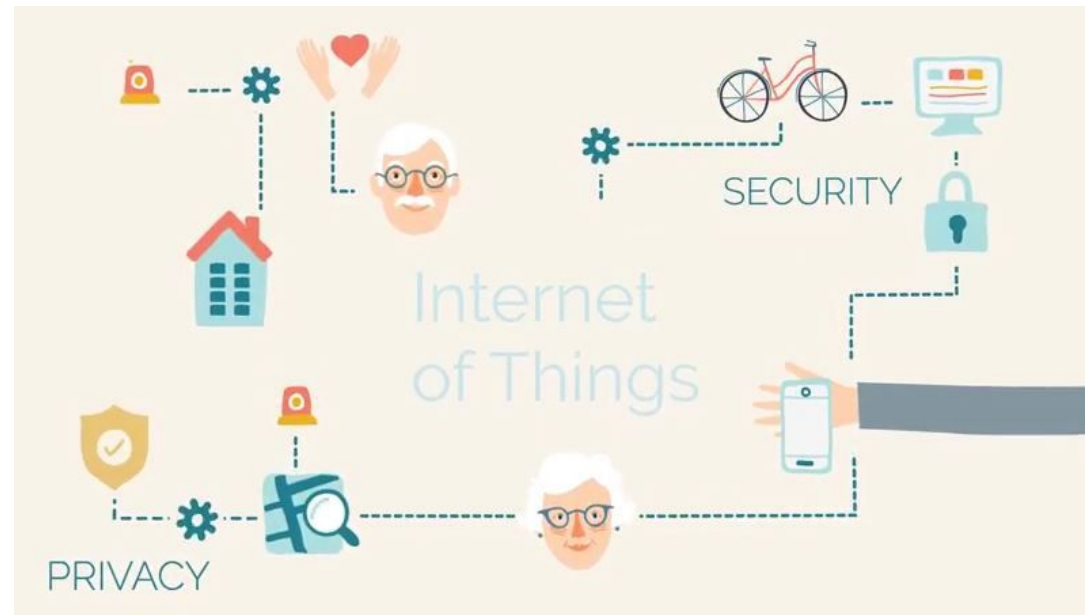
Horizon 2020 ActiveAge project uses the Internet of Things (IoT), ActiveAge aims to prolong and support the independent living of older adults, whilst responding to real needs of caregivers, service providers and public authorities. Have a look at the video to see how this works.

ActiveAge is building the first European interoperable and open IoT ecosystem enabling the deployment, at a large scale, of IoT based services for Active and Healthy Ageing.

This ecosystem will be integrating thousands of devices to collect and analyse environmental and lifestyle information, identify needs, and provide customised solutions, while ensuring data privacy and security.

The vision of ActiveAge is to be the global world-wide reference for providing the evidence that:

- Standard-secure-intraoperative IoT ecosystems enable new business models and cost-effective solutions for Active and Healthy Ageing;
- This innovation contributes to the sustainability of health and care systems, the competitiveness of the European industry, and more quality of life and autonomy of older adults in the form of independent living.





European research programmes are vital instruments to achieve this goal. The Seventh Framework Programme for research and technological development (FP7; 2007-2013) supports research into the process of healthy ageing and age-related illnesses, biomedical advances, as well as prevention and disease management strategies. Targeted research calls focus on gathering the knowledge required to improve public health strategies, and achieve high-quality healthcare and healthcare systems.

As in the case of child health research, funding of research on the health of an ageing population is also addressed as a cross-cutting issue in the entire FP7 health theme. This is a reflection of the need for age-related health issues to filter through the gamut of research fields.

FP7 research activities into the health of an ageing population will help unravel the basic mechanisms of human development and ageing, provide the knowledge base to promote healthy living and address complex issues triggered by our changing expectations of life.

Research on human development and ageing includes:

- Determining the biomarkers of ageing,
- Understanding the developmental processes of long-lived organisms throughout their lives,
- Studying the immune system in old age,
- Establishing a roadmap on ageing research in Europe,
- Increasing the participation of elderly in clinical trials,
- Studying determinants of ageing and longevity and the role of environment,
- Building a consensus definition of frailty.
- Since the beginning of FP7, over €115 million have been invested to support collaborative, multidisciplinary projects in the area of Human Development and Ageing.







The European Commission (EC) is taking proactive measures to tackle the future challenges posed by an ageing population by prioritizing initiatives that will contribute to building a healthy and active population for the future.

The European Commission has identified active and healthy ageing as a major societal challenge common to all European countries, and an area which presents considerable potential for Europe to lead the world in providing innovative responses to this challenge.

The European Innovation Partnership on Active and Healthy Ageing is a pilot initiative which brings together key stakeholders (end users, public authorities, industry); all actors in the innovation cycle, from research to adoption (adaptation), along with those engaged in standardisation and regulation. The Partnership provides these actors with a forum in which they can cooperate, united around a common vision that values older people and their contribution to society, identify and overcome potential innovations barriers and mobilise instruments.

EuroHealthNet is an active partner of the European Innovation Partnership on Healthy and Active Ageing (EIP-AHA). They are part of the group working on Action Group D4: Innovation for age-friendly buildings, cities and environments. The D4 Action Group is comprised of local and regional authorities from across the EU, European NGOs, technology providers, research centres, and SMEs. The Action Group seeks to devise strategies for adapting EU environments to suit the needs of the ageing population.

For the 2016-2018 period, the D4 AG overall objective was to *'contribute to create a more inclusive society, communities and R&D systems across Europe by empowering older people to actively participate in the creation of age-friendly environments through scaled-up inclusive solutions.'*

Four broad domain areas have been identified as key to reaching this objective:

1. Innovative employment policies and the silver economy
2. Technologies and social networks; innovation, accessibility and universal design
3. Age-Friendly Tourism and its impact
4. Inclusive Smart Cities

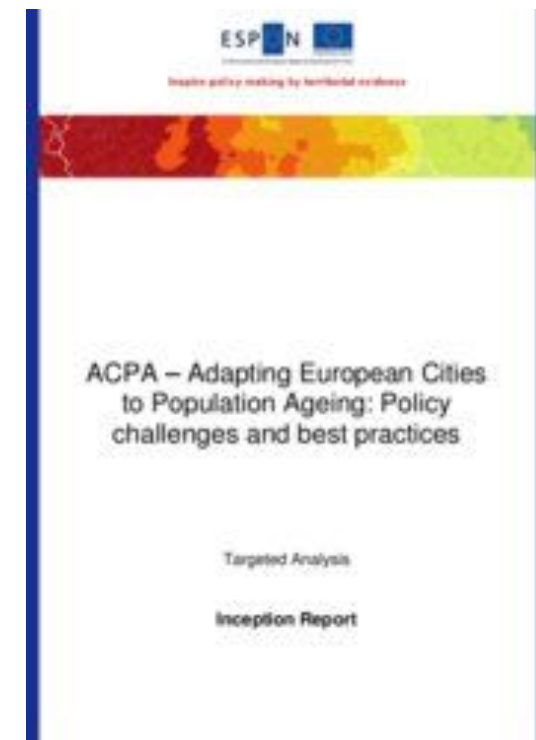


European Innovation  
Partnership on Active  
and Healthy Ageing

ESPON ACPA will investigate the effectiveness of policies and initiatives to develop age-friendly cities and initiatives that support “ageing in place” in eight cities and city-regions. ACPA’s results will directly feed into the adaptation and development of policies and action plans related to age-friendly cities and social programmes including post-2020 cohesion policy.

In-depth case studies will be carried out in the stakeholder cities; in addition, the researchers will draft a “practical guide” with good practices and policy recommendations that can enable transferability of the ACPA outcomes to other cities. The guide will target actors and policy makers in the stakeholder cities and at the national level.

Ultimately, the results of ESPON ACPA will provide a better understanding of the impact of the policies implemented in each stakeholder city and contribute to strengthening policies and initiatives towards developing more age-friendly cities not only for the stakeholder cities, but also Europe as a whole.







# China

***Economic Giant, History of Intervention in  
National Demographics, a 5-year Plan  
on Elderly Care***



# Summary of Relevant Government-Led Longevity Initiatives in China

302

- In 2017 the government announced a 5 year plan on elderly care for providing better quality public services for senior citizens. The plan includes:
  - Improving pension and healthcare systems.
  - A nationwide information network for basic health insurance.
  - A minimum living allowance.
  - Reimbursement for families living in hardship.
  - Incentives for greater involvement of private capital, NGOs and elderly care institutions.
  - Greater investment in geriatric care departments (ranging from care wards to basic exercise facilities).
- **In 2011 a baseline survey of 10, 000 individuals** was conducted for the China Health and Retirement Longitudinal Study (CHARLS) headed by Zhao at Peking University and funded in part by the U.S. In order to enable multidisciplinary studies on issues related to ageing population, every two years it collects a representative sample of Chinese over 44. It reveals dramatic changes to the Chinese Longevity landscape, industry and lifestyle.



20th Century

## **Baby Boom Under Mao Zedong's Rule.**

1980s

## **Universities For the Elder.**

Universities for the elder created, initially for retired cadres of the Chinese Communist Party.



北京大学  
PEKING UNIVERSITY

2011

## **China Health and Retirement Longevity Study.**

In 2011 a baseline survey of 10, 000 individuals conducted for the China Health and Retirement Longitudinal Study (CHARLS) headed by Zhao at Peking University and funded in part by the U.S. In order to enable multidisciplinary studies on issues related to ageing population, every two years it collects a representative sample of Chinese over 44. It reveals dramatic changes to the Chinese Longevity landscape, industry and lifestyle.



2017

## **Novel Elderly Care Plan.**

In 2017 the government announced a 5 year plan on elderly care for providing better quality public services for senior citizens.





Life Expectancy	Both sexes life expectancy (2019)	75.9 years
	Male life expectancy (2018)	75 years
	Female life expectancy (2018)	77.9 years
GDP	GDP per capita, current prices (2018)	10.15 thousand (\$)
	GDP per capita, PPP (2018)	19.52 thousand (\$)
	GDP, current prices (2018)	14 220 billion (\$)
Population Ageing	Rate of population ageing	3.3 (2007-2017)
	Aged over 65 (2018)	11.9%
	Age dependency ratio (2017)	15%
Healthcare Efficiency	Health expenditure (2017)	1.75% of GDP
	Health expenditure per capita (2017)	1.071 thousand (\$)
	Healthcare efficiency score (2018)	54
Retirement	Total # retired	147 532 179
	Retired people proportion	11%
	Normal retirement age (Man/Woman)	65 years / 65 years
	Early retirement age (Man/Woman)	60 years / 55 years

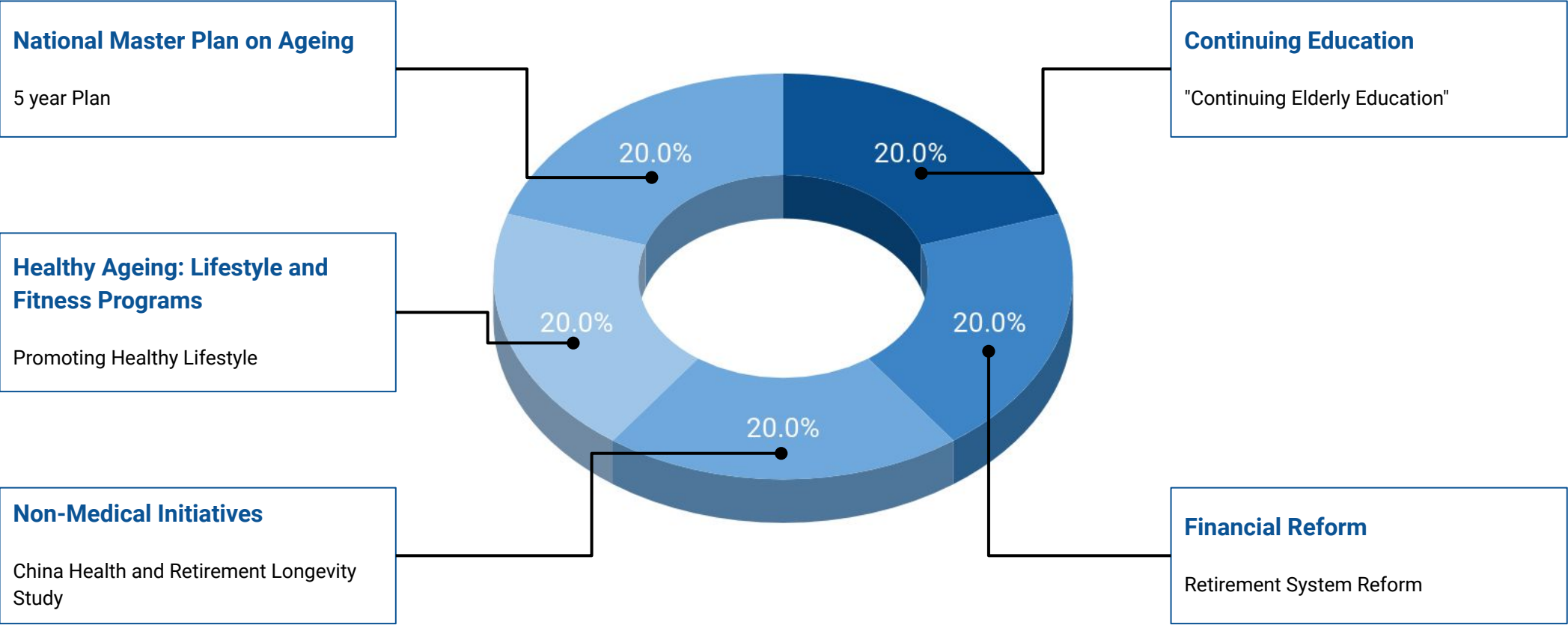
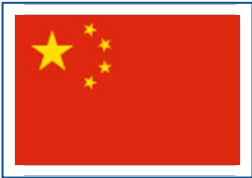
## Longevity Initiatives



- Age of relevant initiatives: **40 years**
- **9** of WHO age-friendly cities and communities
- **4** initiatives focused on non-medical improvement of quality of life



# China Initiatives Level of Comprehensiveness



## Underrepresented Initiatives

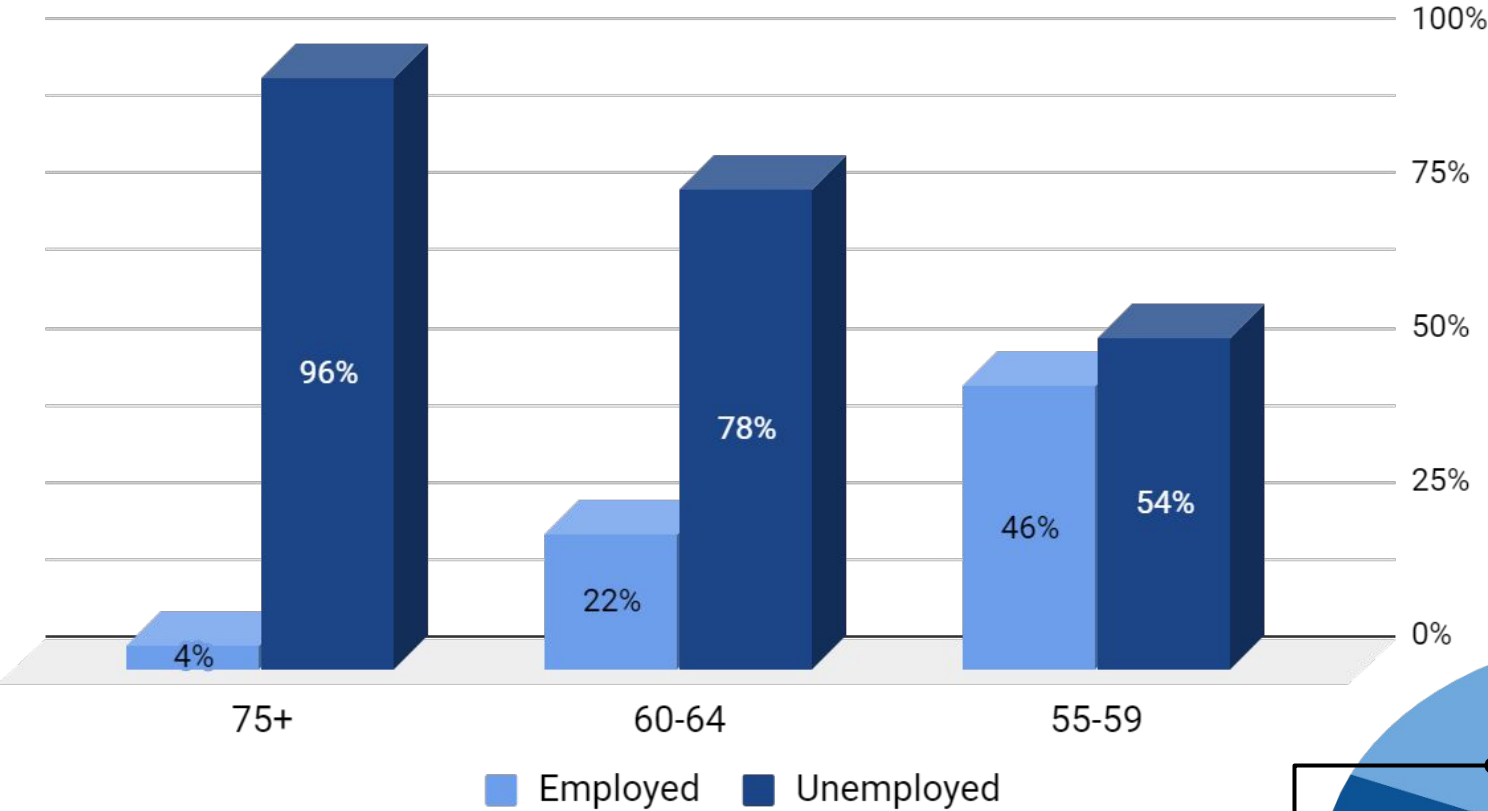
Preventive Medicine	Geroscience R&D	AgeTech	Elderly Healthcare Vouchers	Longevity Industrial Strategy
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# China Age/Employment Range

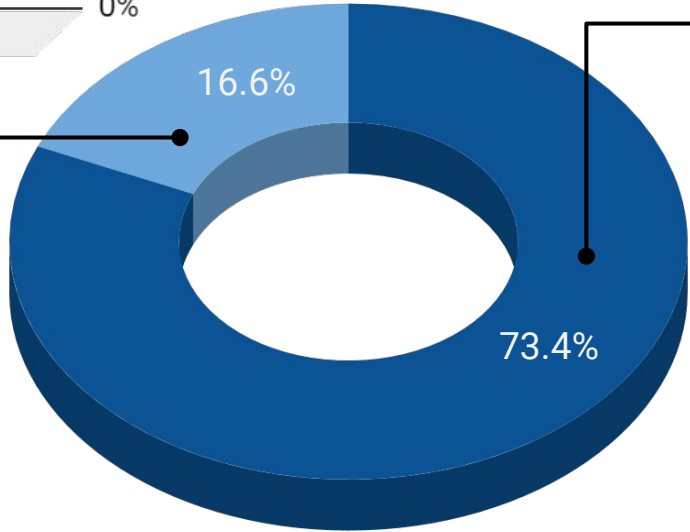


Fraction of the Unemployed by Age

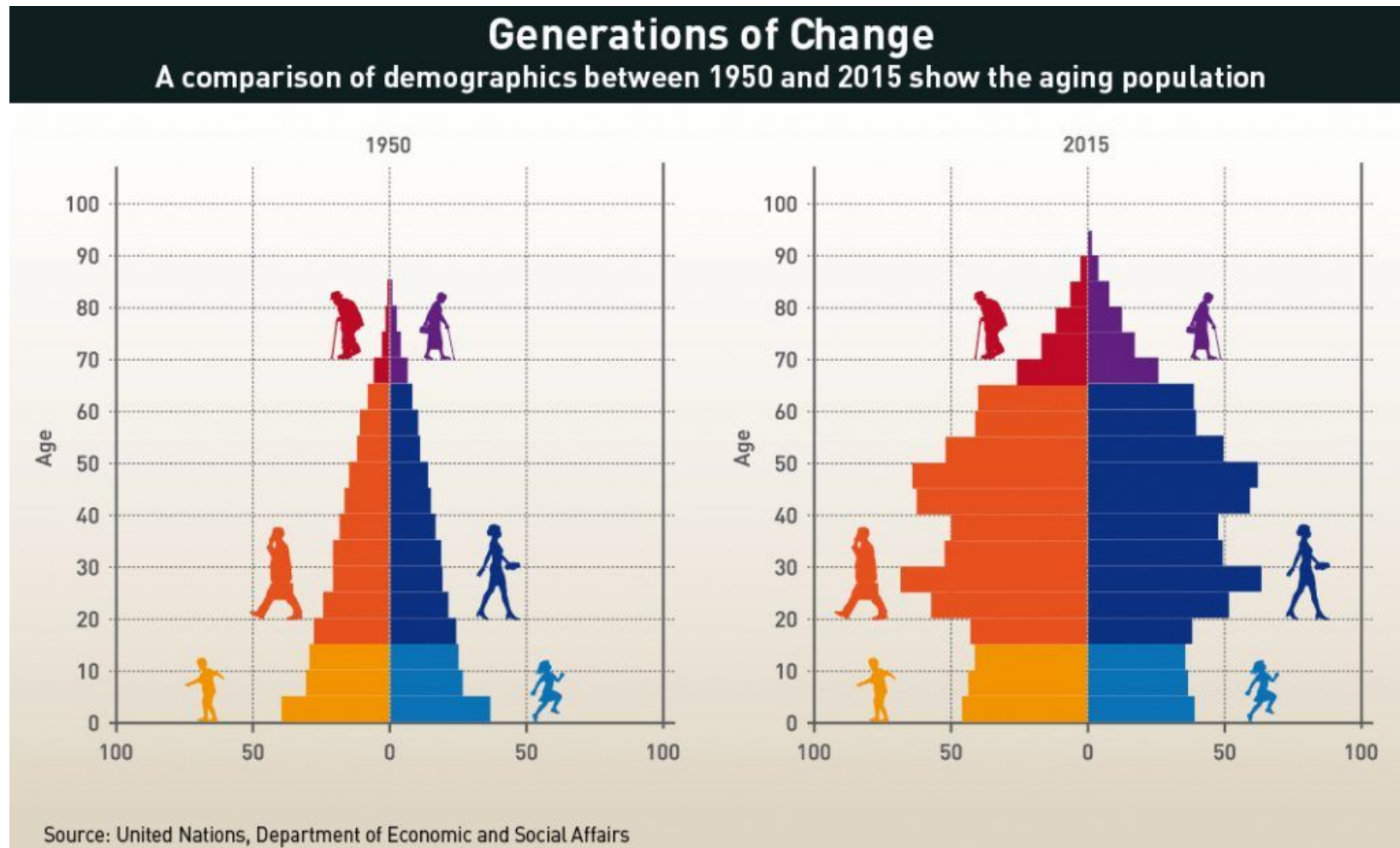


Percent of people under 60

Percent of people over 60



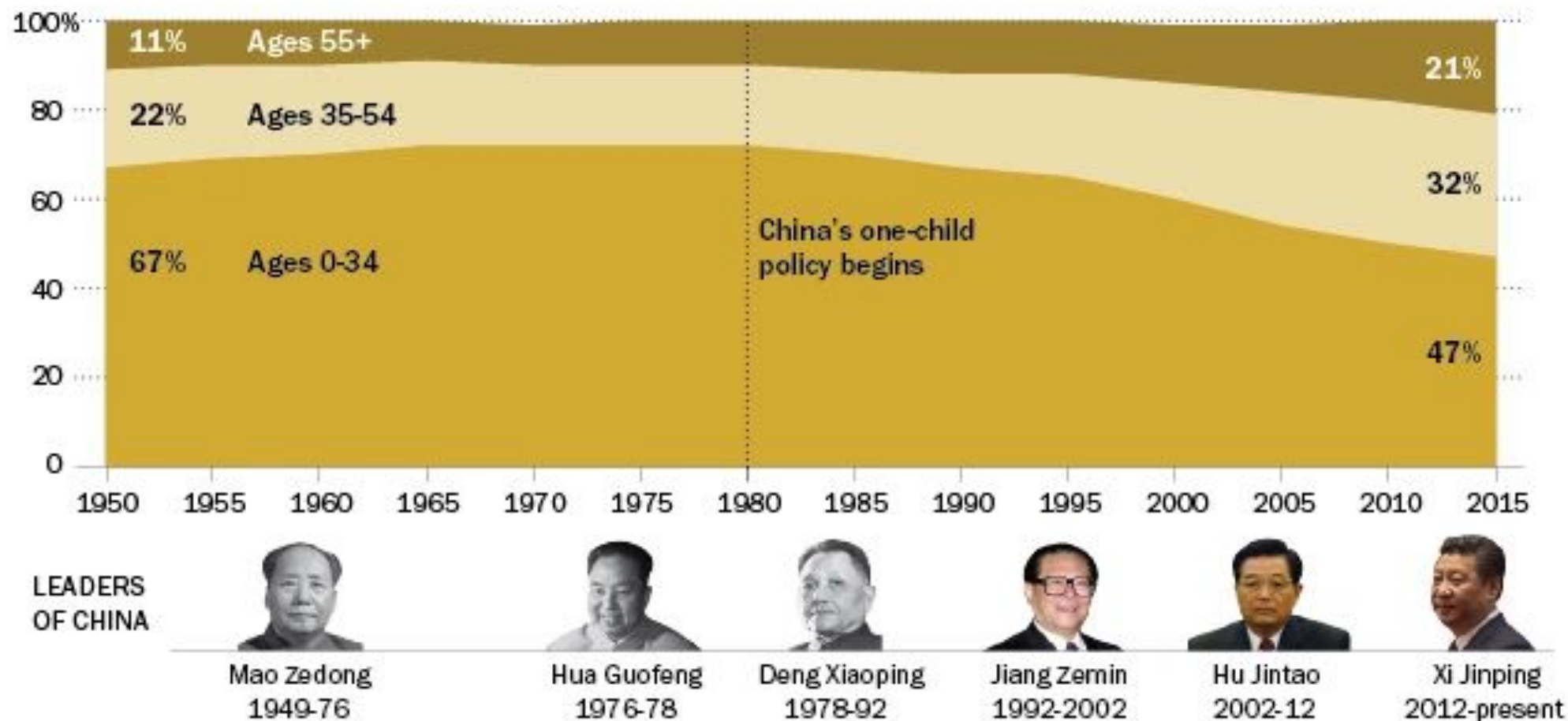
For 35 years from 1980, China forbade parents from having more than one child, to control a booming population. The upshot is there are now far more older people than younger – an imbalance set to worsen further in coming decades. The working age population is shrinking dramatically: in 2010, there were about five Chinese taxpayers for every senior citizen; by 2030 there will be two. In 15 years, 400 million people will be over 60. Caring for them will be enormously costly. The government has relaxed the one-child policy. It may prove too little too late.





# Chinese Population Today is Less Youthful Than Under Past Regimes

Share of the population, by age group



Note: Data do not include Hong Kong, Macao, Taiwan and Special Administrative Regions. Only 'paramount leaders' shown.

Source: United Nations Population Division, DESA, World Population Prospects: The 2015 Revision

Photo credits (all via Getty Images): Print Collector (Mao Zedong); Keystone (Hua Guofeng); Keystone-France/Gamma-Keystone (Deng Xiaoping); Ulrich Baumgarten (Jiang Zemin); Xavier Rossi/Gamma-Rapho (Hu Jintao); Fred Dufour (Xi Jinping)



China has resolved to provide more quality public services for senior citizens, as a way to deal with an ageing society, according to the five-year plan on elderly care issued by the State Council on March 6 2017.

According to the plan, pension and healthcare systems will be improved. According to the plan, by 2020, 80 percent of urban and rural residents should enjoy basic pension insurance, and 95 percent of citizens should be covered by basic health insurance.

A nationwide information network for basic health insurance will be built to facilitate settlement of healthcare costs for retired people across regions, said the plan.

Local governments will be encouraged to include basic rehabilitation devices in the reimbursement catalog for families living in hardship.

According to the plan, minimum living allowance and other social assistance should be available for all registered poor senior citizens. As an integral part of elderly care, families and communities are asked to take their share of responsibilities. Community elderly care centers will receive more government funding.

Private capital and nongovernment organizations will have more access to the elderly care market, so that senior citizens can have more options in diverse services. By 2020, elderly care beds provided by governments should account for no more than 50 percent of the total.

Hospitals and elderly care institutions were asked to enhance cooperation and services, and more efforts should be made to build rehabilitation hospitals, nursing homes and palliative care institutions.

The plan said that hospitals ought to do more in rehabilitation and the fight against old-age diseases, the plan said. By 2020, over 35 percent of hospitals above second-class will have geriatric care departments. More physical exercise facilities will be built and open for old people free of charge. Sports organization for senior citizens will be encouraged.

China's targets for elderly care services in the nation's top development plan show how determined the government is to tackle the challenges of an ageing population, according to officials. Zhu Yaoyin, deputy director of the general office of the National Working Commission on Ageing, said the incorporation of improving elderly care services in the nation's development road map is part of the top leadership's key measures for addressing an ageing population.

A group of officials from various government departments that influence the quality of services for seniors gathered on Tuesday to explain what benefits the 13th Five-Year Plan (2016-20) may bring for the public. The previous year, 230 million Chinese, or 16.7 percent of the population, were over 60 years old. Currently, the ratio between working age people - 16 to 60 - and the retired population is 2.8-to-1. That is expected to drop to 1.33-to-1 by 2050, according to Jia Jiang, deputy director of pension insurance for the Ministry of Human Resources and Social Security.

The plan states that private capital and nongovernment organizations will have more access to the elderly care services market, so that seniors have more options of diverse services. The number of beds for the elderly in public hospitals and care agencies is expected to account for no more than 50 percent of the total by 2020. Currently, private-owned elderly care institutions account for about 40 percent of the total nationwide, with the proportion exceeding 50 percent in some provinces. Pension and healthcare systems will be improved, with 90 percent of urban and rural residents enjoying basic pension insurance, and 95 percent of citizens being covered by basic health insurance, according to the plan. Hospitals should improve rehabilitation services and step up the fight against old-age diseases, the plan said, adding that by 2020, more than 35 percent of middle and top-tier hospitals will have geriatric care departments.

Meng Zhiqiang, deputy director of social welfare and philanthropy promotion for the Ministry of Civil Affairs, said that despite ongoing efforts to invite more private capital into the elderly care services sector, the move has not met the expectation. One problem is that administrative approval procedures are complicated and lengthy, and that the threshold for private elderly care agencies remains high. The government will continue working under the guidance of the latest five-year plan to make it easier for entrepreneurs to enter the elderly care services market.

Nearly 150 million seniors in China suffer from long-term diseases, while more than 40 million seniors are affected by deteriorating mental or physical health. According to official estimates, by 2020, the number of seniors living on their own will reach 118 million.

While the rapid ageing of China's population is thought to condemn the nation to a dismal future, past policies on education and new policies to improve health and foster internal migration could ease the challenges posed by an older citizenry, according to a new study of the impact of ageing on China's future. Problems that need attention include China's growing obesity rate and high smoking rates among men and rising levels of urban pollution, challenges that could increase health costs if they trigger disease in older ages, according to the report published online by the Journal of the Economics of Ageing.

In addition, China should reform migration policies to allow older Chinese residents to move about the nation more freely and retain full health benefits when they relocate. Such a change would allow older citizens to follow their children as they move about China.

The three authors of the study are James P. Smith of the RAND Corporation, John Strauss of the Department of Economics at the University of Southern California, and Yaohui Zhao with the National School of Development of Peking University. "There will not be a demographic fix to healthy ageing in China, even if the one-child policy is relaxed, since fertility is unlikely to change much," said Smith, Chair in Labor Market and Demographic Studies at RAND, a nonprofit research organization. "Government policies need to focus on improving health behaviors, combating pollution and allowing elderly parents to live with their adult children."

Researchers say that Chinese people, reaping the health benefits of dramatically improved education levels, will live longer and healthier lives in future decades, even among those who live in remote areas of the country.

"If you look at a cross section right now, it can be very misleading for ageing population in China," Smith said. "In 20 years, Chinese people who are 50 today are not going to look at all like Chinese people in their 70s right now."

Better education will make a difference in the health of Chinese citizens as they get older, researchers say. For example, the survey found that today 80 percent of women and 40 percent of men over the age of 75 were illiterate. But in the age range of 45 to 54, only 20 percent of women and 5 percent of men were illiterate, and the education levels of young adults is virtually the same for both men and women today.

But Chinese people also are making the same health-threatening lifestyle choices as people in the rest of the world. Smoking rates among men remain high, rates of obesity among men and women are growing, and China's urban areas have extraordinarily high levels of pollution. And as young people migrate to cities for schooling and jobs, their ageing parents could be left to fend for themselves in remote areas, according to the study.

The research team analyzed information from the 2011-2012 wave of the China Health and Retirement Longitudinal Study (CHARLS), which is collected by researchers headed by Zhao at Peking University and is funded in part by the U.S. National Institute of Ageing. The survey is a nationally representative sample of people 45 and older in continental China. Chinese respondents from more than 10,000 households will continue to be followed every two years in face-to-face interviews. In 1950, the life expectancy in China was about 40 years, growing to about 70 today, with every indication the trend toward longer life will continue. The biggest change that will affect Chinese people as they age is a rising education level.

Chinese citizens also are getting diagnosed and treated for common conditions such as hypertension and diabetes, conditions that just a few years ago they didn't even realize they had. "The silent killers are now being heard," Strauss said. The tradition of children caring for ageing parents also is undergoing dramatic change, with fewer children available as caretakers. In 1950, the average Chinese woman had six children. Projections are that in China, in part due to the one-child policy, by 2050 women will have 1.9 children, or below replacement level fertility. "If you have five kids, it's a lot more certain that one of them will take care of you than if you only have one or two," Zhao said.

Today, more than 90 percent of elderly people have a child living with or near them. But indications are that that is changing. While 94 percent of people over 75 live with or near a child, that is true for only 82 percent of those 55 years old. And when children leave rural areas for cities, some government policies make it difficult or impossible for parents to follow. For example, today almost all rural Chinese people have health insurance. But insurance pools are operated at the county level, and reimbursement for care decreases while co-payments increase for care received outside of one's home county. Such policies discourage older parents from following their adult children to new locations.

"A larger fraction of parents will not have access to an adult child," Zhao said. "That's not a crisis of the moment, but a potential crisis of the future." Changes in China's one-child policy are unlikely to affect this since China's fertility rate is very similar to other countries at the same level of development, according to researchers.



# Continuing Elderly Education in China: “The University for the Aged”

The University of the Aged is on the frontline in a fight against one of the most dramatic and potentially destabilising problems facing modern China: a looming demographic crisis that experts believe will have major implications for everything from the wellbeing of hundreds of millions of citizens, to the Communist party's ability to hold on to power, and even the prospects for world peace.

Wang Feng, a University of California, Irvine scholar who is recognised as one of the leading experts on Chinese demographics, has said the combination of these trends would place a monumental strain on the nation's resources in the coming years and had the potential to radically alter its social, economic and political landscape.

China is not the only country bracing for a severe ageing crunch but Wang says a potent mixture of challenges mean its situation is particularly daunting. “It's massive, it is unique, and it takes place in the most populous country in the world.”

At the university – where students pay just 80 yuan (£9.60) a term – students and staff say they are content with the government's efforts to protect China's pensioners.

“The government and the party are taking good care of the elderly,” said Yu, the flautist, as local officials who were offering a tour of the three-floor facility looked on.

Yan Xingzhang, 78, the university's head, said decades of unprecedented economic development had transformed life in Rudong and meant its entire population was far better off than in the past.

“It's impossible to describe how big the changes have been and how good things are now,” said Yan. Miao, the deputy headmaster, dismissed the idea that the one-child policy was a major demographic blunder for which his county was now paying a price. “The happiness of the elderly isn't defined by the number of children people have,” he said. “In the olden days there was a saying: ‘Raise children to look after you in old age.’ But these days we have a very good social insurance system so nobody thinks about whether family planning was a mistake.”



The present report has aimed to deliver a comprehensive international overview of the projects, initiatives and efforts that different countries across the globe are making in order to combat the issues associated with populating ageing and to promote the extension and maintenance of their citizens' Healthy Longevity.

Notably, the report finds that the United Kingdom comes out in the #1 position according to its proprietary comparative analysis, concluding that the nation is in a very strong position to become a leading nation in Healthy Longevity, and to deliver tangible benefits to its citizens through the prioritization of Healthy Longevity as a key component of its national strategic agenda, such as increases in its nationwide Health-Adjusted Life Expectancy (HALE) and a reduction in the economic burden posed by its Ageing population.

The report also charts how the nation can most successfully build upon previous efforts in this direction, such as its naming the Ageing Population as one of its four core Industrial Grand Challenges, and its allocation of £300 million to promote industry efforts focused on securing the nation's position as the world leader in Healthy Longevity. While the UK's longevity readiness was certainly evident prior to the production of this report, the novel analytical approaches used in assessing the strength of various nations' Longevity development initiatives validate this notion quantitatively for the first time.

Furthermore, the report charts important next steps that the UK government can execute in order to translate its efforts into tangible deliverables like increased healthy life expectancy and a thriving Longevity financial industry. The UK Government needs to extend existing efforts and create a framework to change the deficit model of the 'Ageing Society' to an asset model around 'Longevity' and be bold with a national strategy to harness the 'Longevity Dividend' to benefit all people in society. In other words, the nation needs a fully integrated Longevity National Development Plan.

To this end, the development of a Blueprint and Framework for a Government-led National Longevity Development Strategy is one of the core aims of the recently established All-Party Parliamentary Group on Longevity and its secretariat company, Longevity International UK, for which Aging Analytics Agency is the main source of data.



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