



**2018 SOA Asia-Pacific  
Annual Symposium**

**Session 1, SOA Research: Autonomous Vehicles and the Impact on  
the Insurance Industry and Insight into Retirement Risk and  
Opportunities in Asia-Pacific Markets**

**Presenters:**

Dale Hall, FSA, CERA, MAAA

Larry Hartshorn

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# The SOA Asia Pacific Annual Symposium

24 May 2018



**SOCIETY OF  
ACTUARIES®**



# SOA Research: Autonomous Vehicles and the Insurance Industry

R. Dale Hall, FSA, MAAA, CERA  
Managing Director of Research  
Society of Actuaries





# Society of Actuaries Strategic Research Programs

## **Strategic Research Programs**

The SOA Strategic Research Programs emphasize the skillset and thought leadership of actuaries, and help provide insights to members, stakeholders, and the public on socially relevant topics.



# Aging and Retirement

Reviews the societal impact of aging populations and the solutions for mitigating risks.





# Actuarial Innovation and Technology



Highlights the evolution of technology as it applies to the actuarial profession, industry and population trends.



# Autonomous Vehicle Research Update

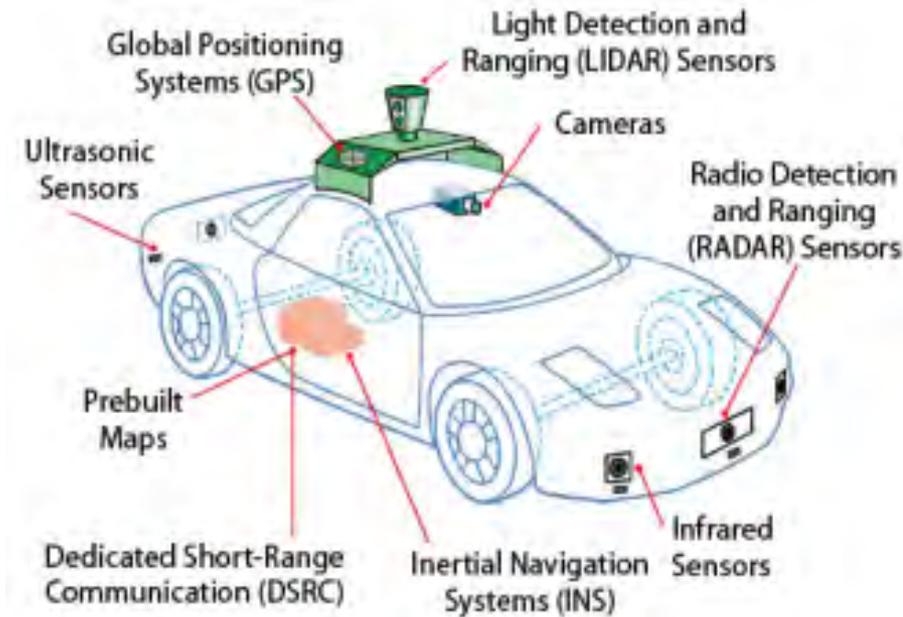
- Sponsored by SOA Research Expanding Boundaries Pool
- Report to be released Summer 2018



Cosmos Magazine, "LIDAR: how self-driving cars 'see' where they're going", October 2016

# Change is constant

- Light Duty
- Private Vehicles
- Shared Vehicles



CRS, based on "Autonomous Vehicles" fact sheet, Center for Sustainable Systems, University of Michigan.

# Change is constant

- Bus
- City Transportation
- Truck
- Delivery Services



Curbed, "Can self-driving technology save the bus?", July 2019

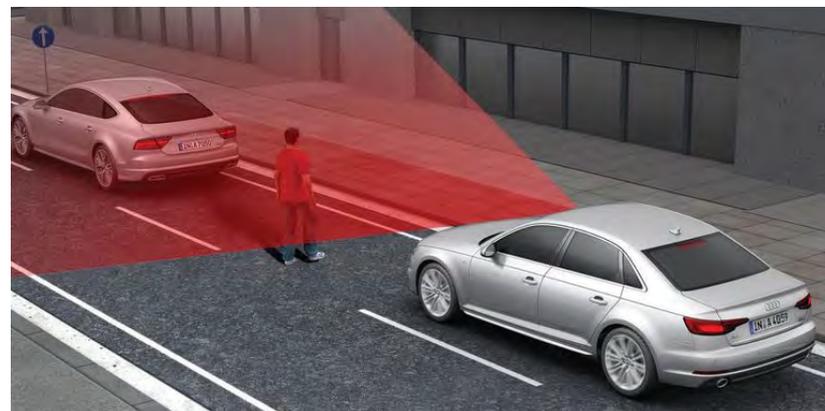


# Manufacturers / Tech firms planning

- All moving from...
  - Safety technology
    - Blind Spot Detection, Forward Collision Warning, Lane Departure Warning, Rearview Video / Traffic Alert
  - To Self-Driving Tech....
    - Collision avoidance, Automatic Emergency Braking, Automated Lane Keeping, Parking Assist
  - To Driverless Tech...
    - No human involvement, all roads, all the time

# “What’s in a name?”

- Automated Emergency Braking
- 20 Automakers
- 20 different answers
- Important to understand for evaluation of insurance risk



Road and Track, 20 Automakers Will Make Automatic Braking Standard In The U.S. by 2022”, March 2016



# Engineering vs. Insurance

- Risk evaluation for insurance likely more than just the technology of the vehicle
  - Specifics of technology important
  - Driver use and understanding important



# Goal: Insurance Framework

- SAE J3016
  - Framework Range
  - 0 = No Automation
  - 5 = Full Driving Automation
- Report framework
  - Insurance risk-based framework to define from ranges from Safe to Self-Driving to Driverless



# The World Keeps Turning

- Uber / Pedestrian Accident, March 2018, Tempe AZ
- Believed to be the first pedestrian death associated with self-driving technology



New York Times, "Self-Driving Uber Car Kills Pedestrian in Arizona, Where Robots Roam", March 2018



# The World Keeps Turning

- Tesla Autopilot Fatal Accident, March 2018, Redwood City, CA
- Autopilot system radar data on stationary objects



Wired, "TESLA'S AUTOPILOT WAS INVOLVED IN ANOTHER DEADLY CAR CRASH", March 2018



# The World Keeps Turning

- Dynamic and quickly changing environment
- Automakers and Tech companies constantly refining plans and strategies



# Outcomes of SOA Research Project

- Insurance Framework
  - Potential evolution paths
  - Trigger points to watch for
- 
- Release Summer 2018
  - Expert Panel Webinar / Interviews





# Asia Retirement

## Asia Consumers – Why?

They're 2/3rds of the World Population



**R. Dale Hall**

Managing Director of Research

Society of Actuaries



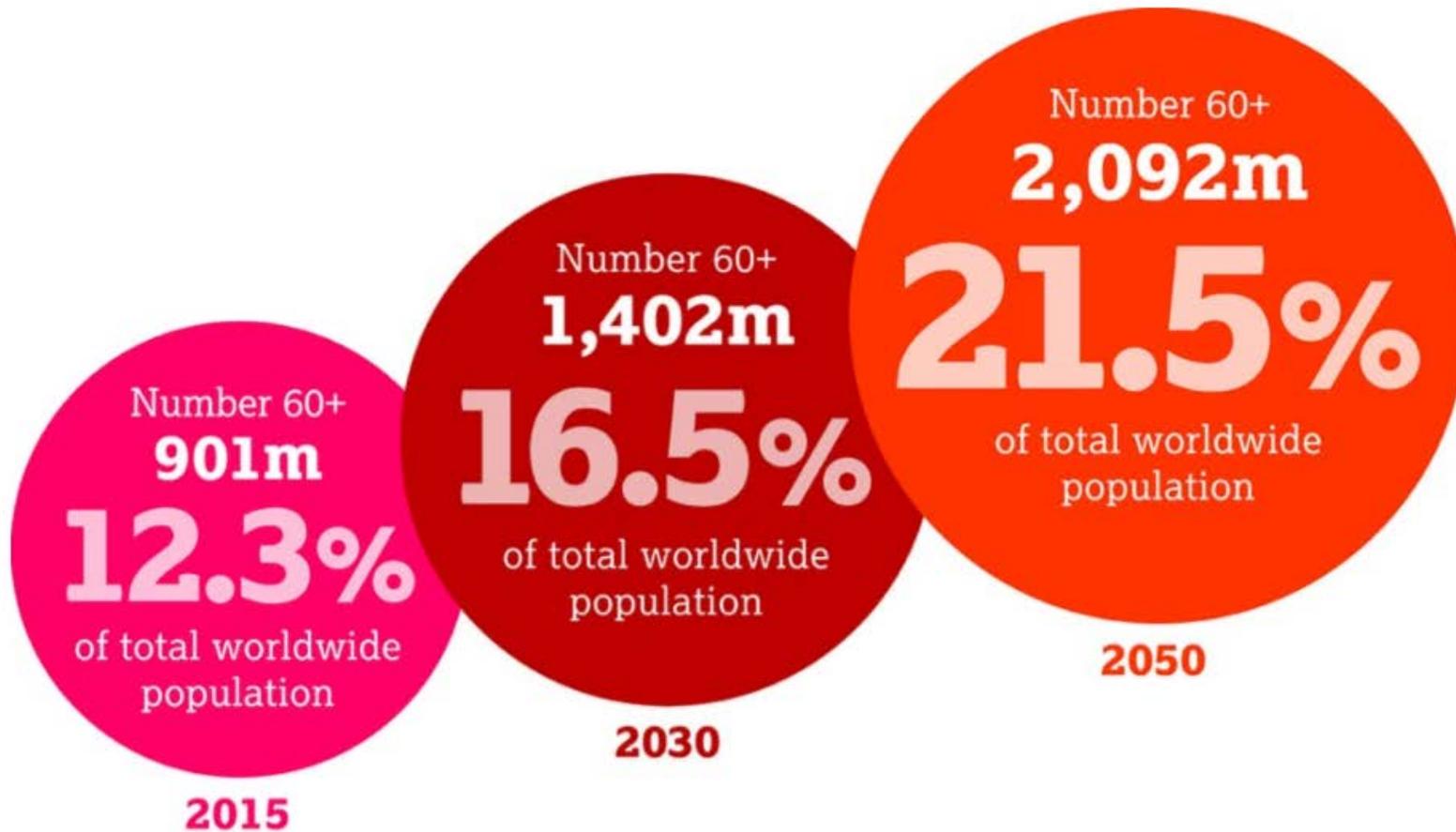
**Larry Hartshorn**

Corporate Vice President & Director

LIMRA and LOMA



# Growth of 60+ globally



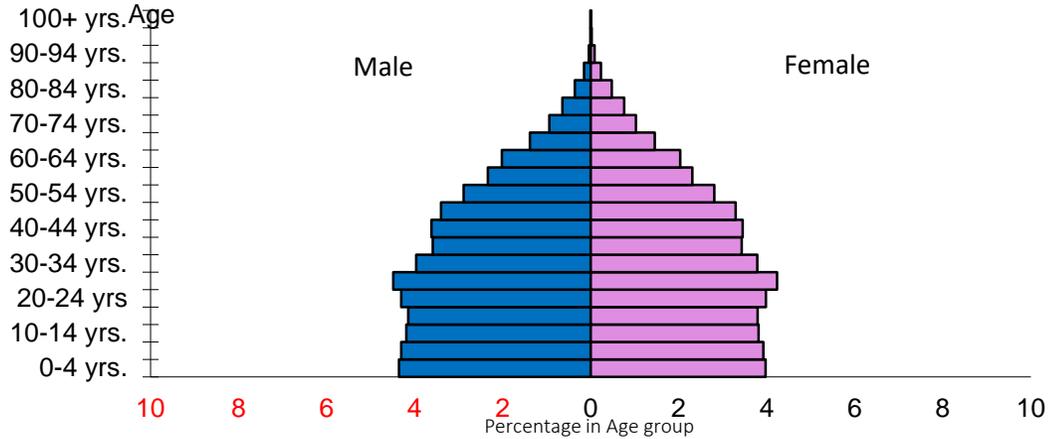
Source: UNDESA Population Division, World population prospects: the 2015 revision, DVD Edition, 2015.

# Population Growth: 2015-2050

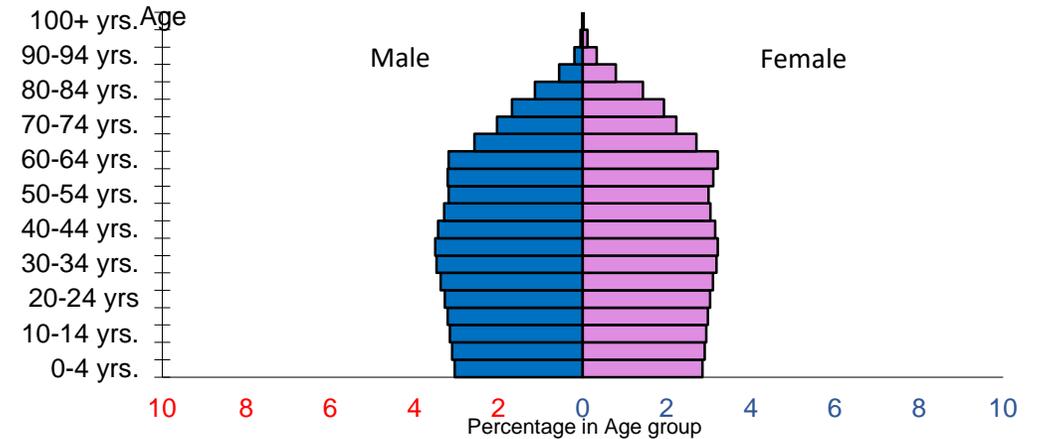
	Overall Population	60+ Population
Asia	19%	148%
Japan	-15%	10%
Thailand	-5%	114%
Taiwan	-3%	116%
China	-2%	123%
South Korea	0%	125%
Hong Kong	14%	112%
Singapore	19%	167%
India	27%	171%
Indonesia	25%	195%

# Population Pyramid – the old, the young & Asia

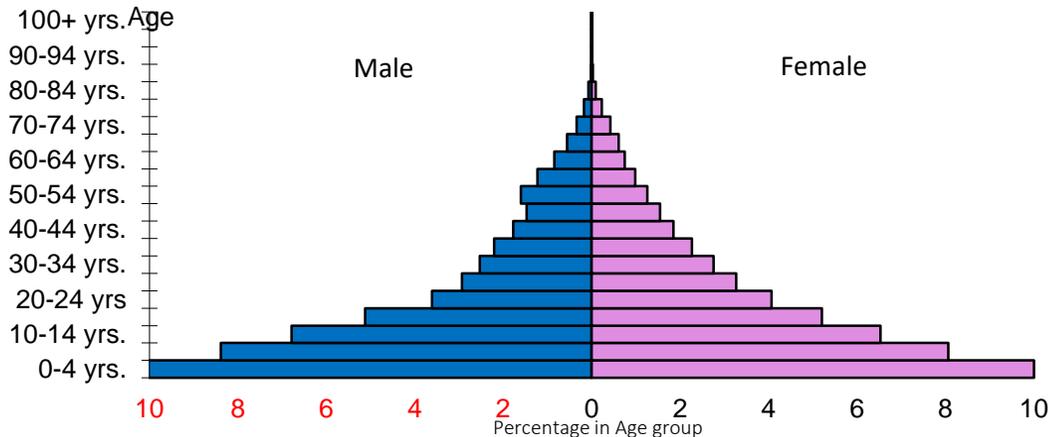
2015 : Asia



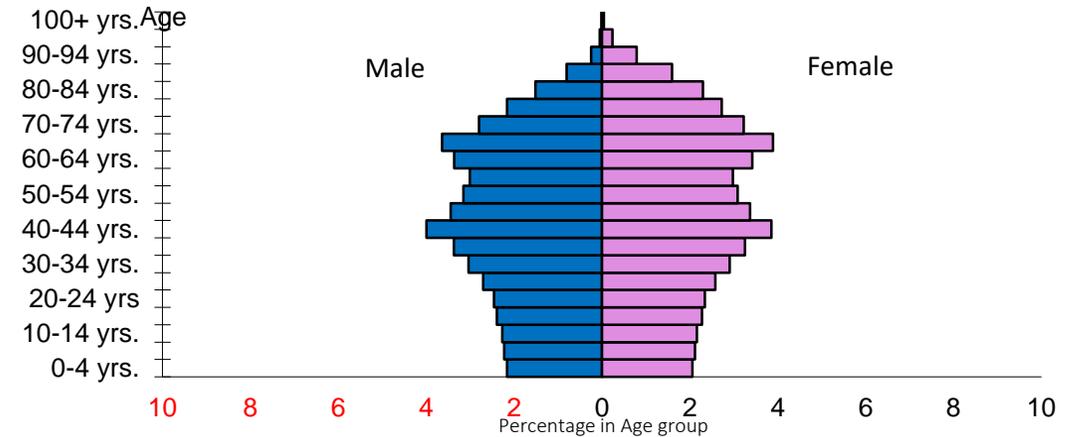
2050: Asia



2015: Niger – Youngest country



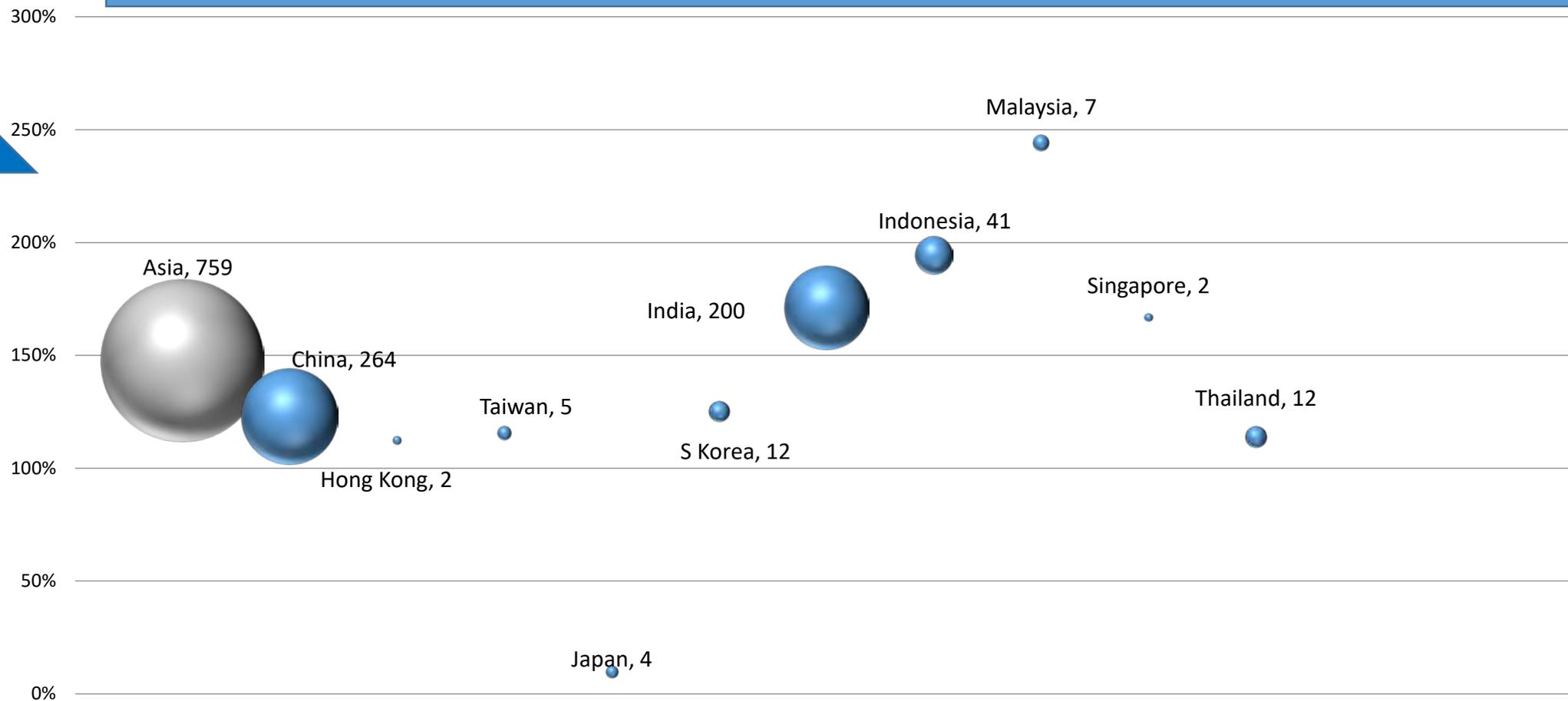
2015: Japan – 2<sup>nd</sup> Oldest country



# Asia's "NEW" 60+ population by 2050: > Current Europe OR 2X US

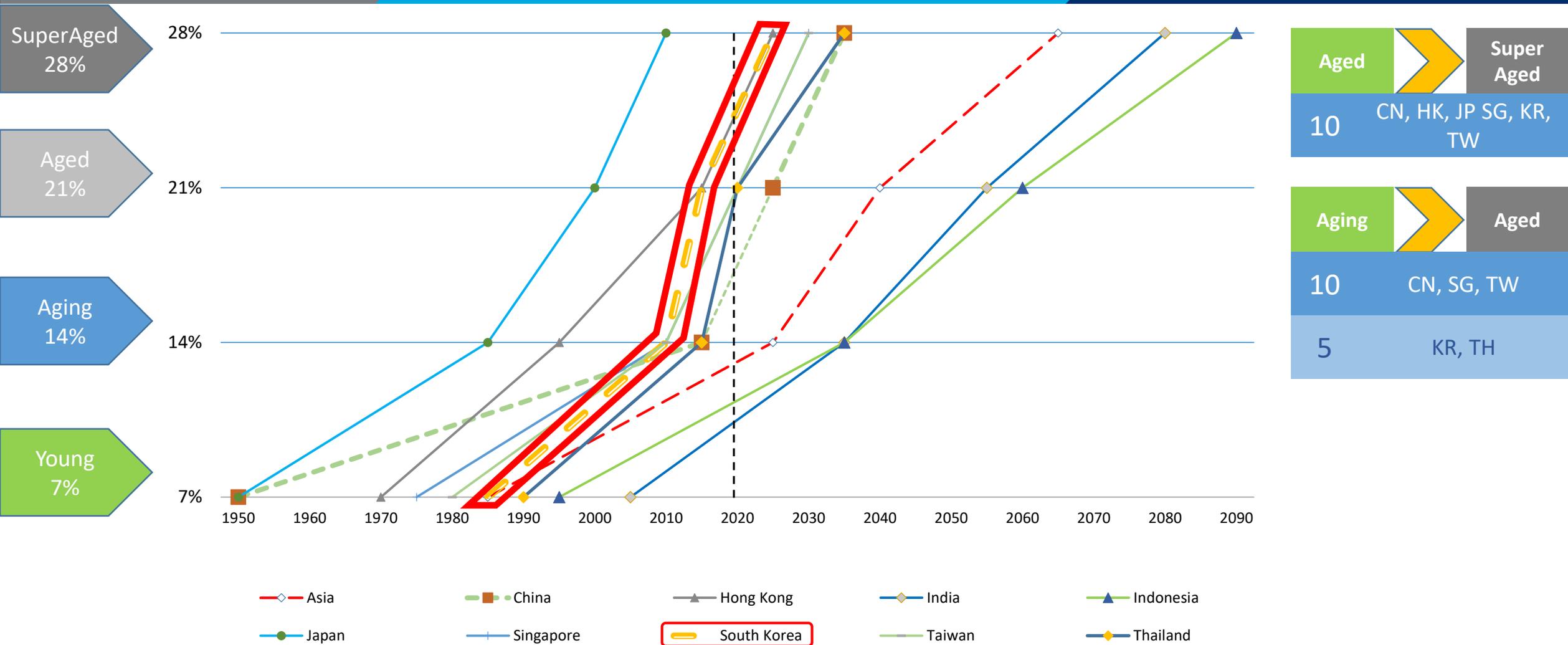
## Additional 60+ population by 2050 vs. 2015 (Millions)

Percentage Growth of 60+ population



Size of bubble represents absolute increase in 60+population (in millions)

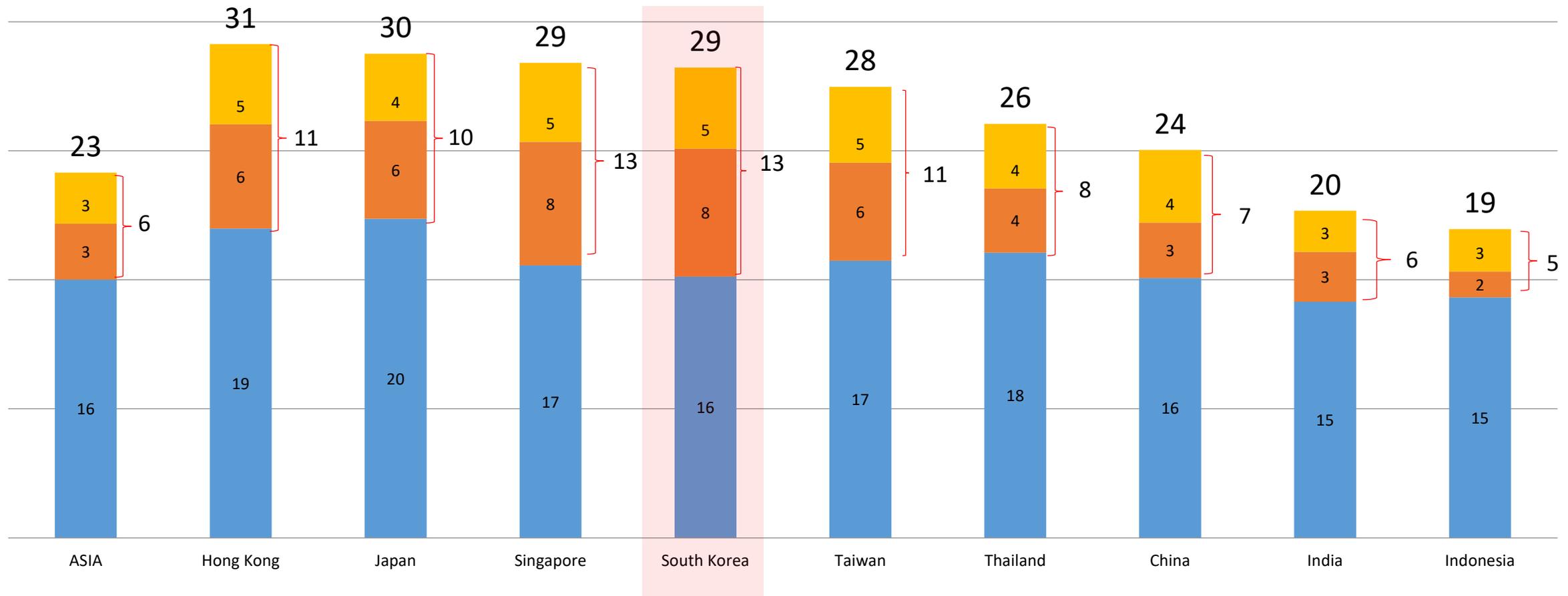
# Asia has entered a phase of rapid aging



Source: UN Population division, LIMRA International Research

# Most are living longer than ever before

## Average Life expectancy at 60 years Age



Source: UN population division

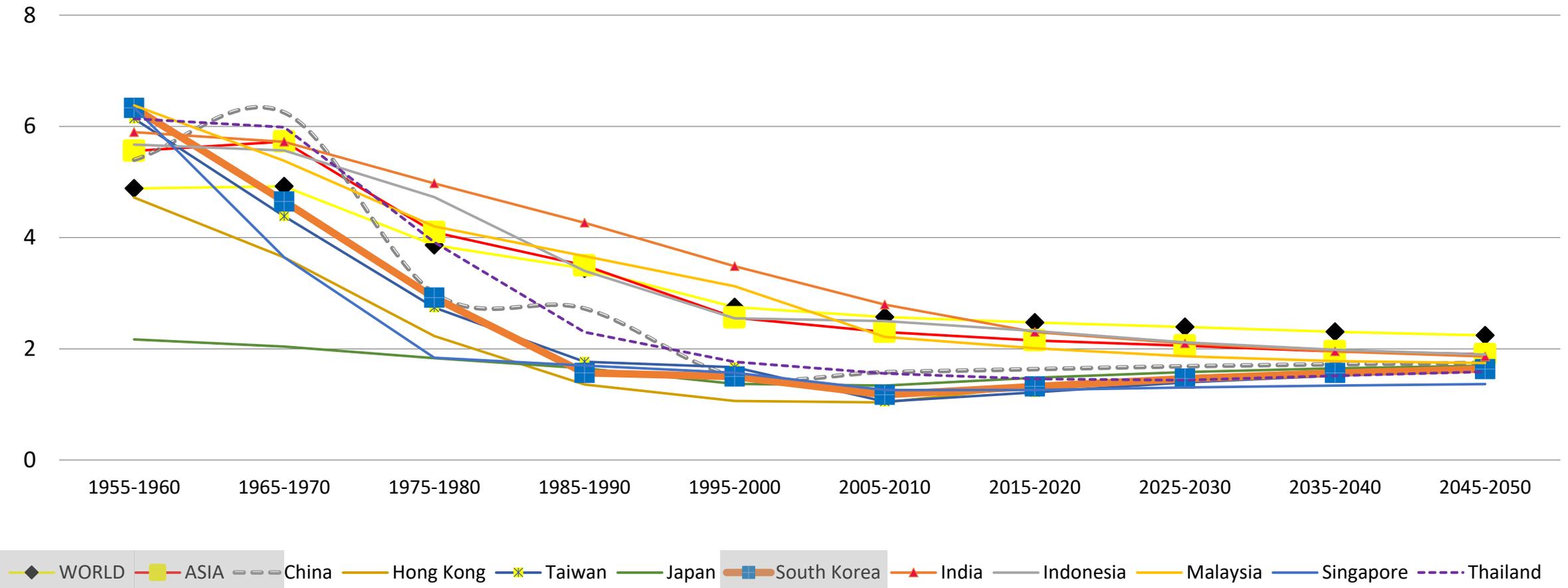
Note: Differences in summation are due to rounding off

■ 1975-80 ■ Increase by 2010-15 ■ Increase by 2050-55



# Lower fertility rate is leading to population decline

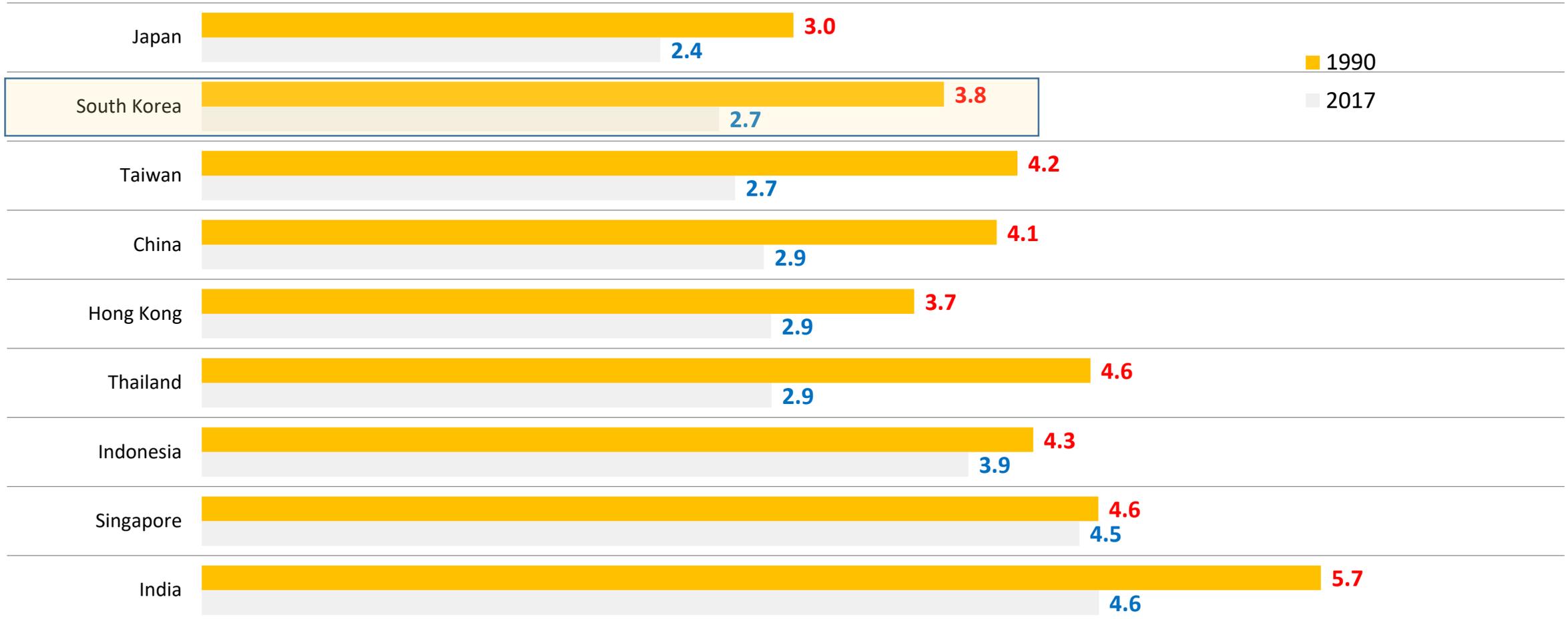
## Live births per woman during childbearing years



Source: UN Population Division, LIMRA International Research

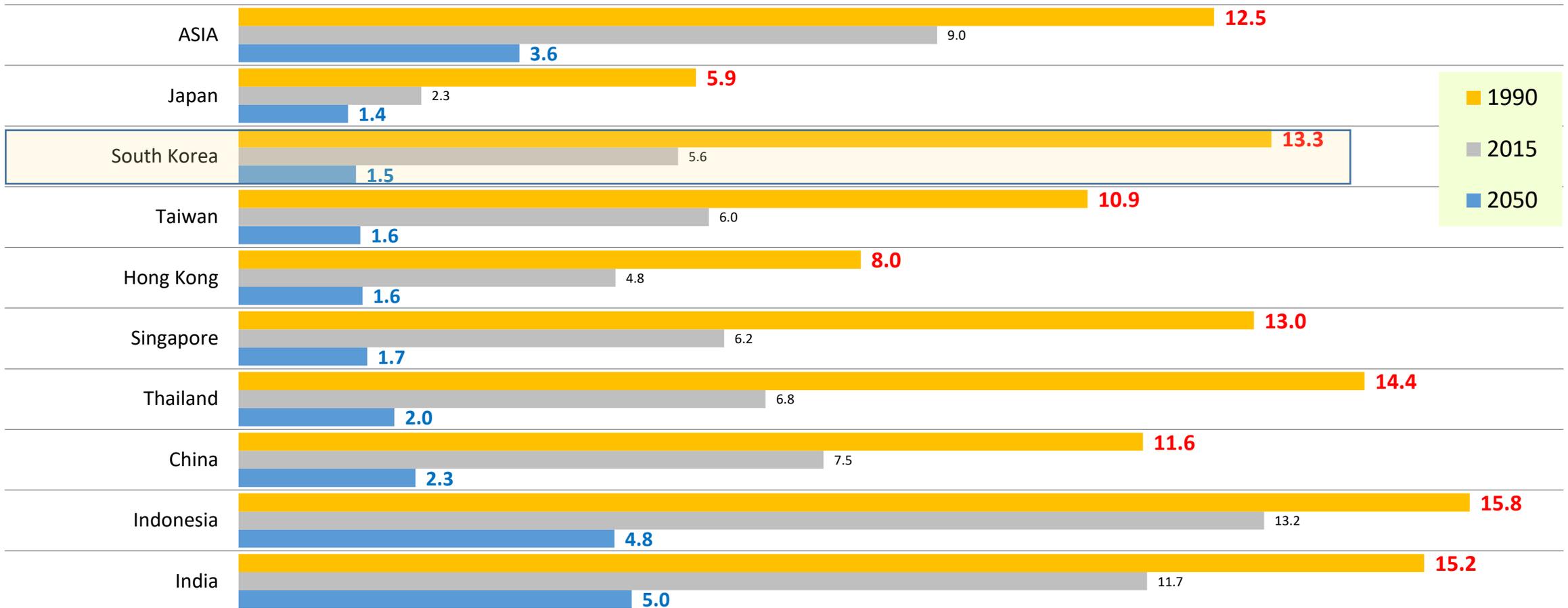
# Socio economic changes & shrinking population is resulting in smaller households

## Average size of households



# Fewer younger ones left to support the Aged

Potential Support Ratio (ratio of population aged 15-64 per population 65+)



Source: UN Population Division, LIMRA International Research

# Most Asian markets were ranked in the bottom half & need major reforms

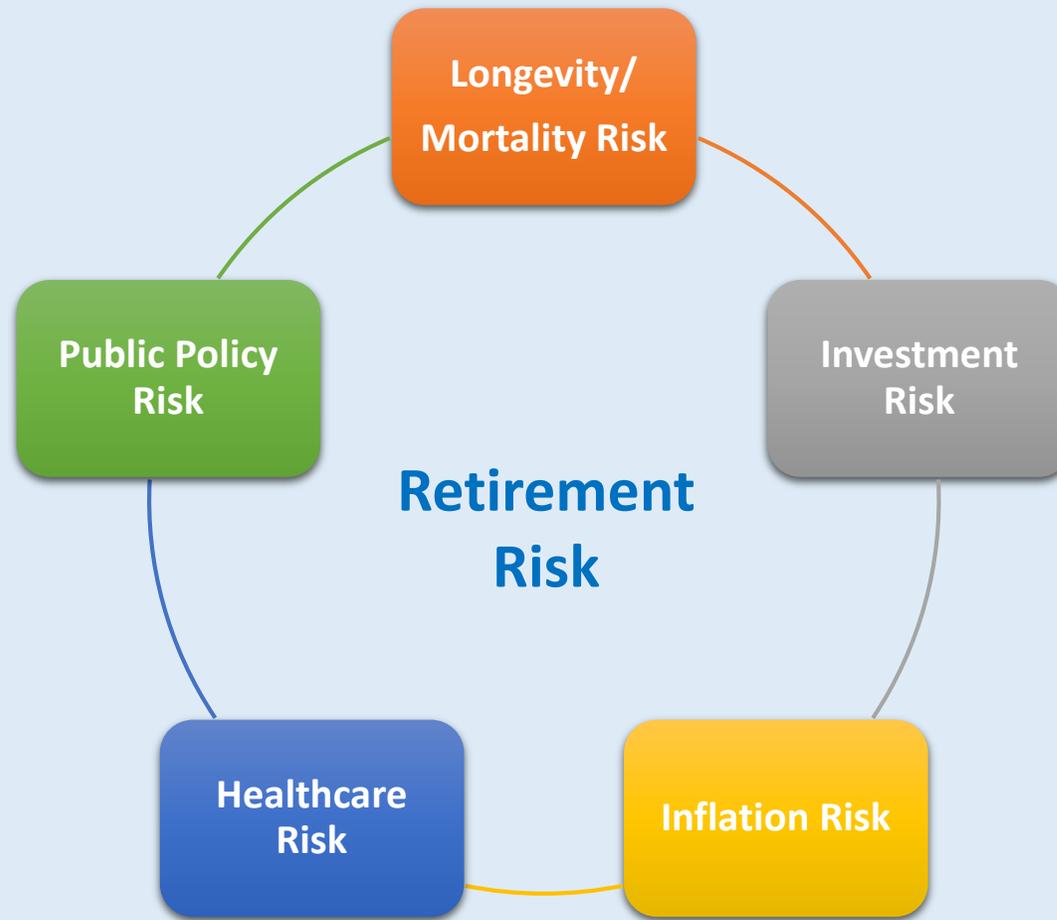
## Pension Sustainability Index

Region	TOTAL	
	Score	Ranking
Hong Kong	7.1	14
Singapore	6.6	24
<b>South Korea</b>	<b>6.5</b>	<b>33</b>
Indonesia	6.2	39
Taiwan	6.2	40
Japan	5.8	46
India	5.8	48
China	5.0	53
Thailand	4.9	54

Demographics	Public Finance	Pension System	Market
Ranking	Ranking	Ranking	
43	10	13	HK
45	18	29	SG
<b>53</b>	<b>11</b>	<b>25</b>	<b>KR</b>
7	7	50	ID
54	17	26	TW
52	50	18	JP
6	6	54	IN
44	24	51	CN
47	19	52	TH

# Majority of the retirement risks can be managed

## Key Retirement Risks



*How are the  
consumers  
preparing in these  
challenging times?*

# About the Research – Consumer perception



- Collaborative research between LIMRA and SOA
- Objective: Study the current state and future opportunity of the retirement market in Asia
- Methodology: Survey of **9,000+** consumers
- Age band: 30-75 years, who make financial decisions
- Target Market: Covering **9** markets including China, Singapore, Hong Kong, Japan, **South Korea**, India, Indonesia, Taiwan, Thailand



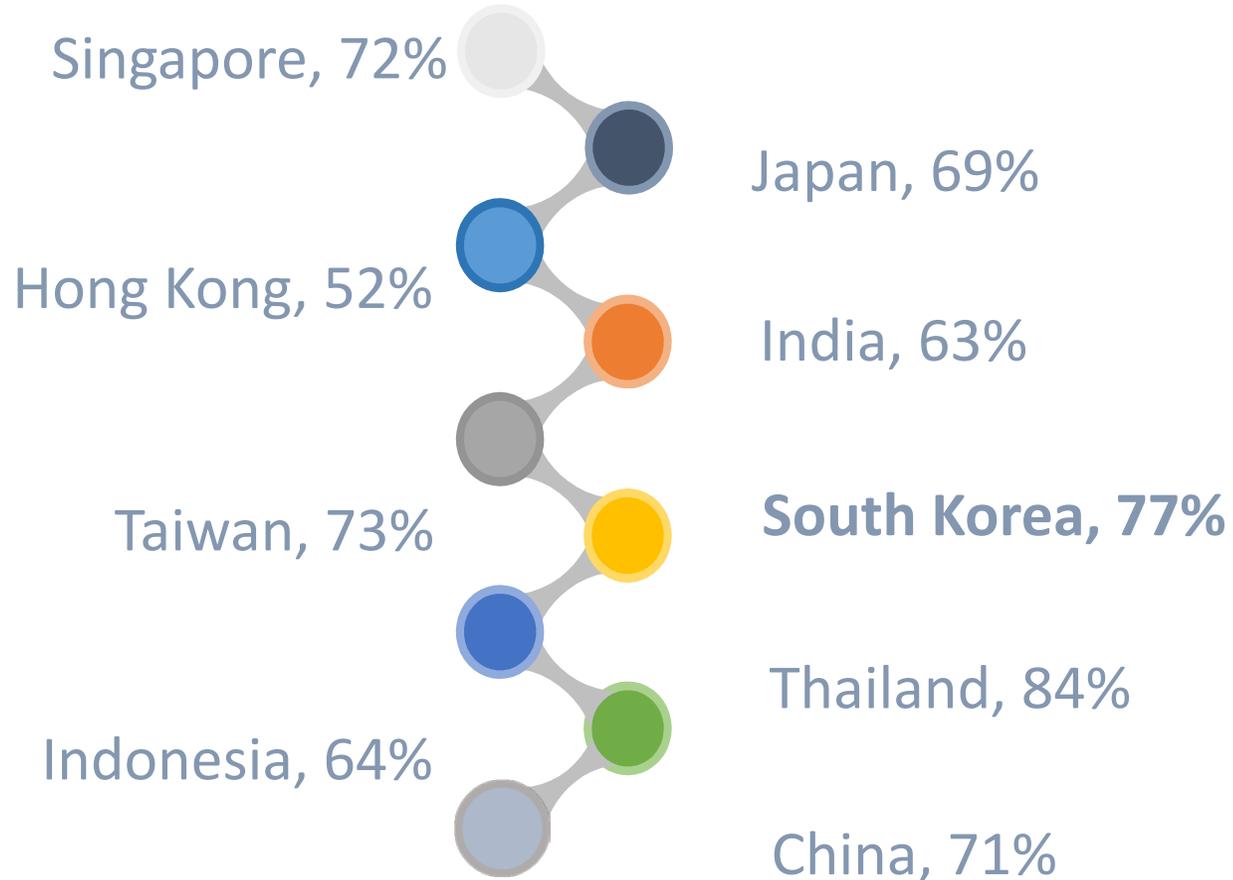
# People have basic expectations from retirement life

## Hopes and aspirations for their retirement (Top 5)

- Maintain physical health and well being
- Spend more time with friends and family
- Financially support my family
- Learn a new skill/hobby
- Travel more

2/3<sup>rds</sup> consider they should be responsible for retirement funds

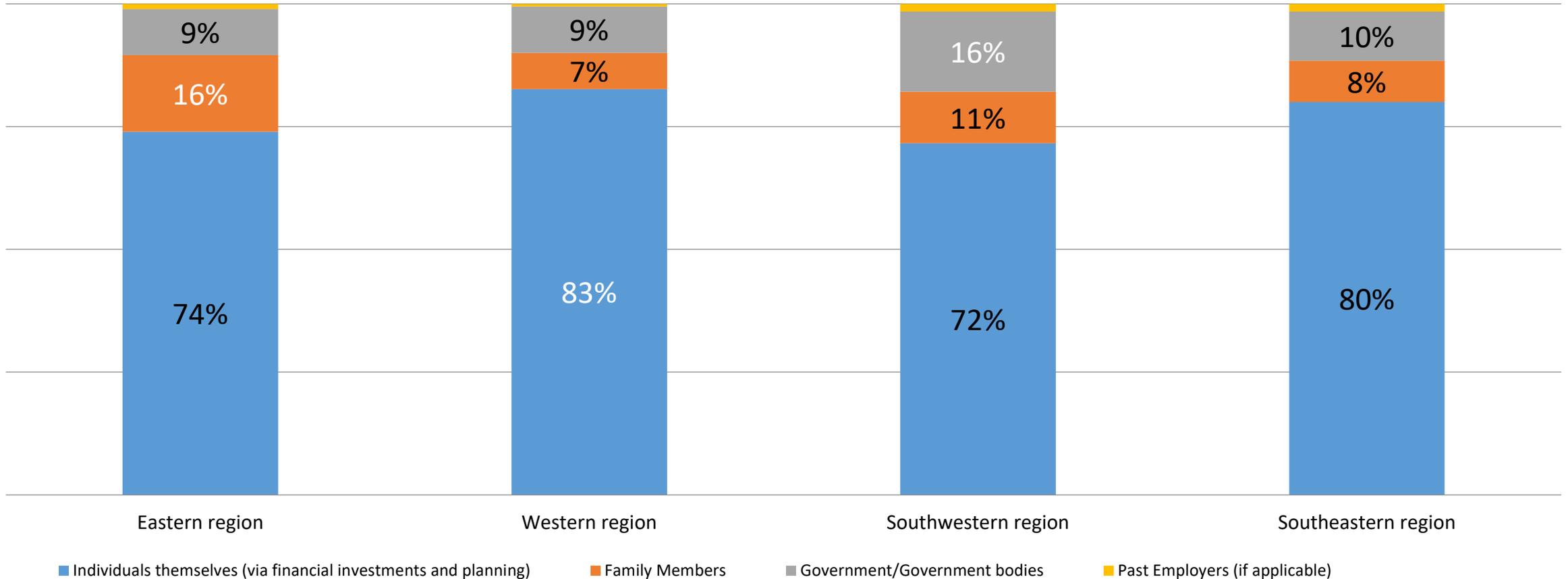
## Individuals themselves should be responsible for providing retirement funds





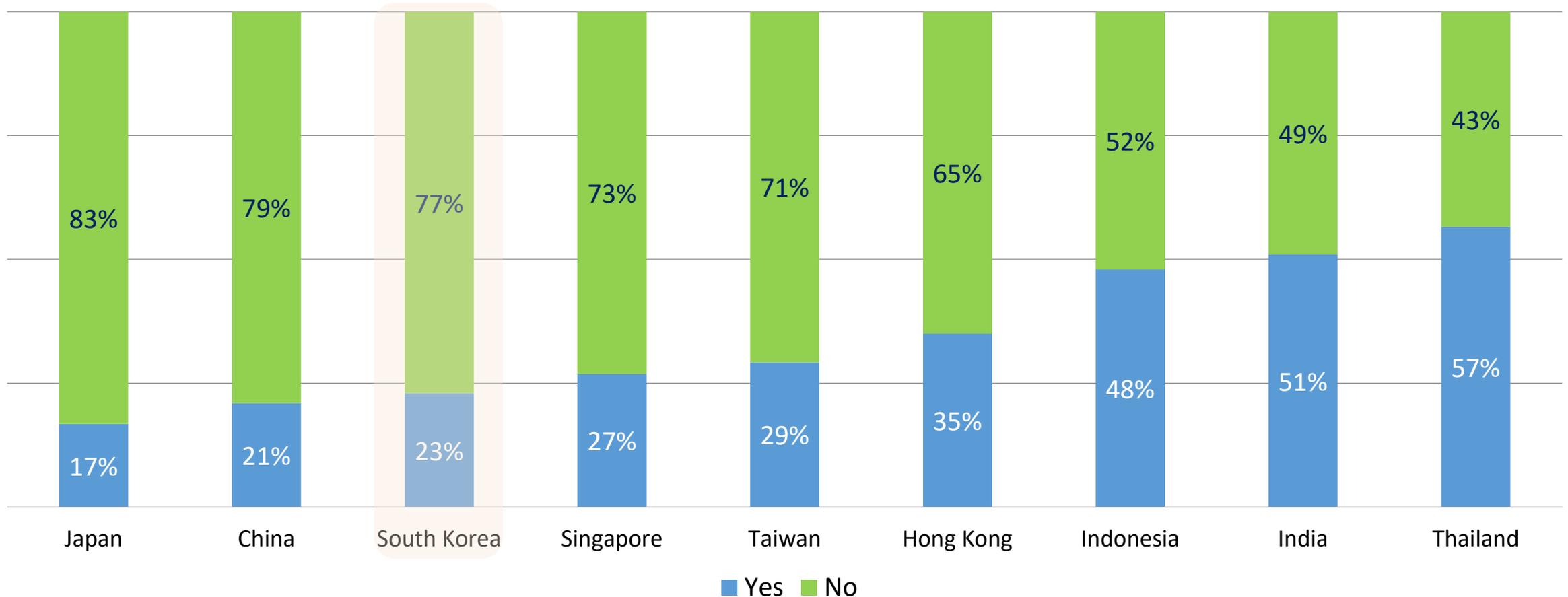
# Koreans take greater individual responsibility for retirement planning

Individuals themselves should be responsible for providing retirement funds



# Nearly ½ of respondents don't have formal retirement plan

Does your household have a formal written plan for managing your income, assets, and expenses during retirement?



# Predictably most are looking for safer options

How does your household plans to generate income from your retirement savings?



- Withdraw only interest and dividend earnings, but not principal
- Generate rental income by investing savings, in property
- Buy or look for guaranteed lifetime income product



- Opt for a reverse mortgage
- A corporate annuity with a tax benefit
- Withdraw some principal and some interest on a regular basis

# Start saving/investing from around late 30's/early 40's

Started Saving/Investing for retirement at the age of...

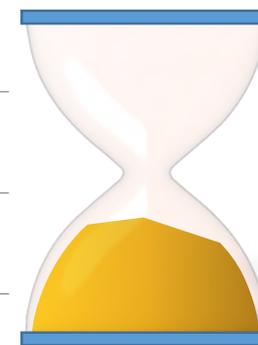
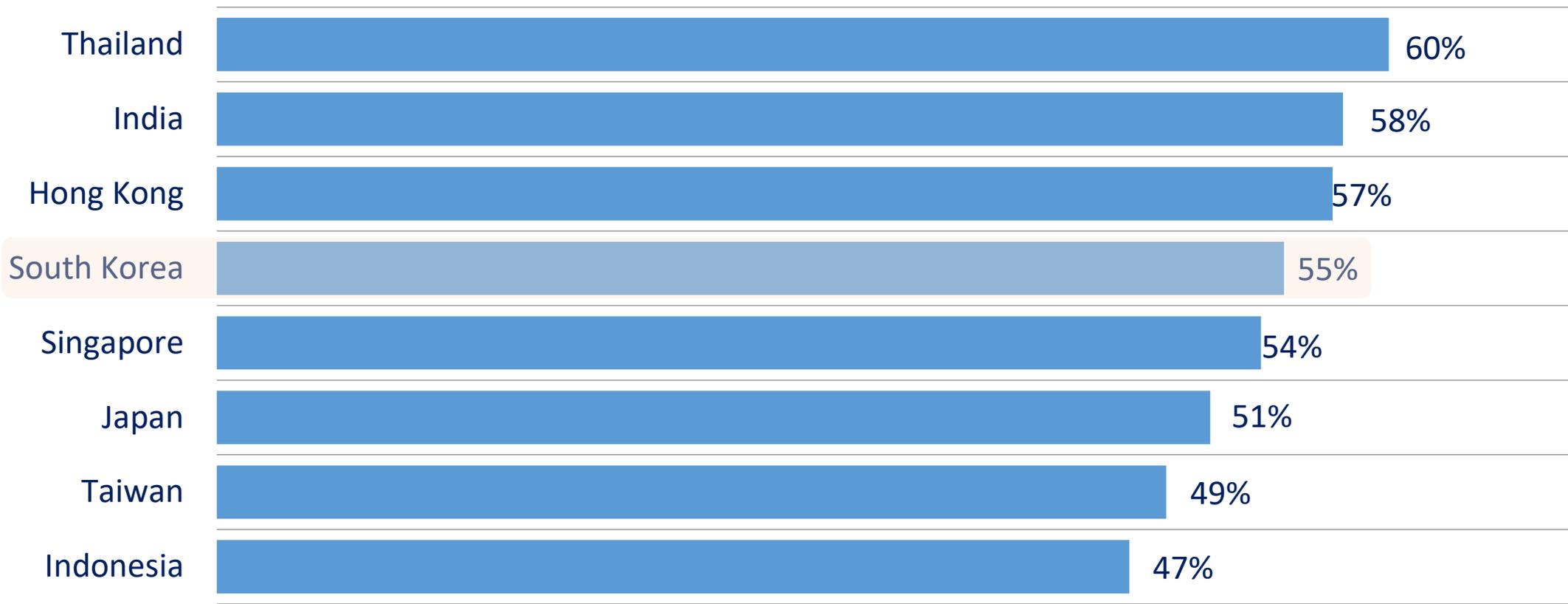
Singapore	Japan	Hong Kong	India	Taiwan	South Korea	Indonesia	Thailand
37	42	38	38	39	44	38	38
25	20	23	24	23	19	23	23

And plan to retire/retired by the age of...

Singapore	Japan	Hong Kong	India	Taiwan	South Korea	Indonesia	Thailand
62	62	61	62	62	63	61	61

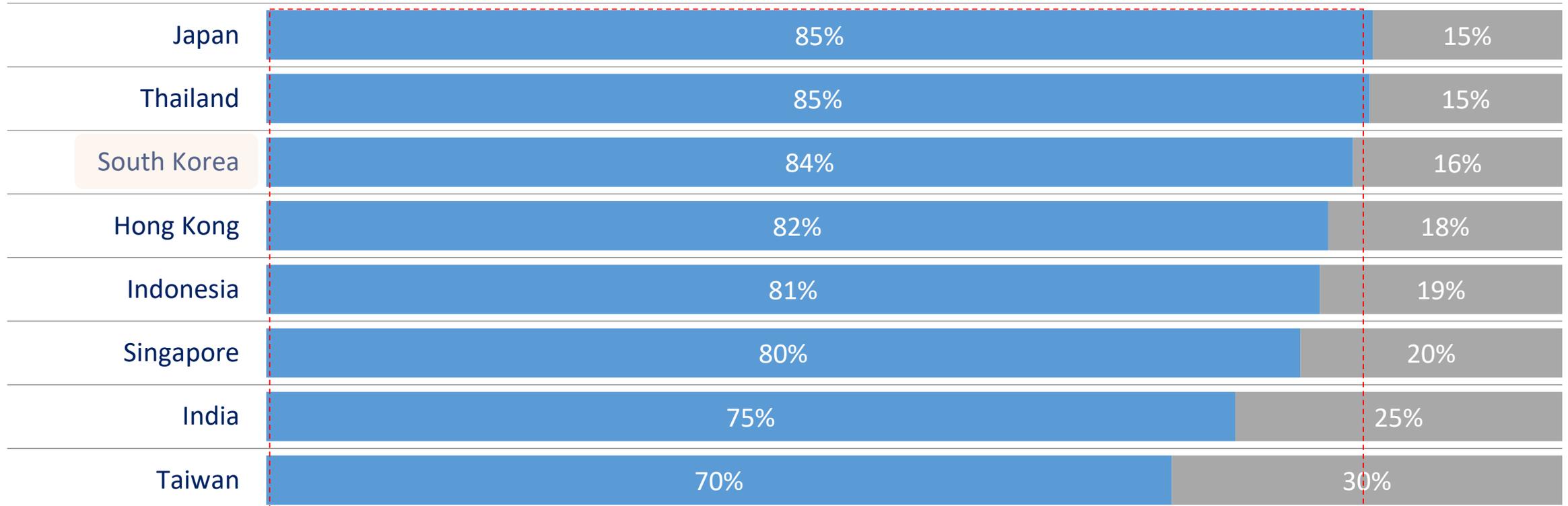
# ...nearly ½ regret delaying retirement planning

I regret, I started saving and investing for retirement a bit late' OR 'I have not started saving for retirement at all'?



# ...Resulting in HUGE GAP in retirement funds

How much of retirement funds do you anticipate to have/had when you turn 60?



Expected saving of retirement fund

0-79%

81-100%

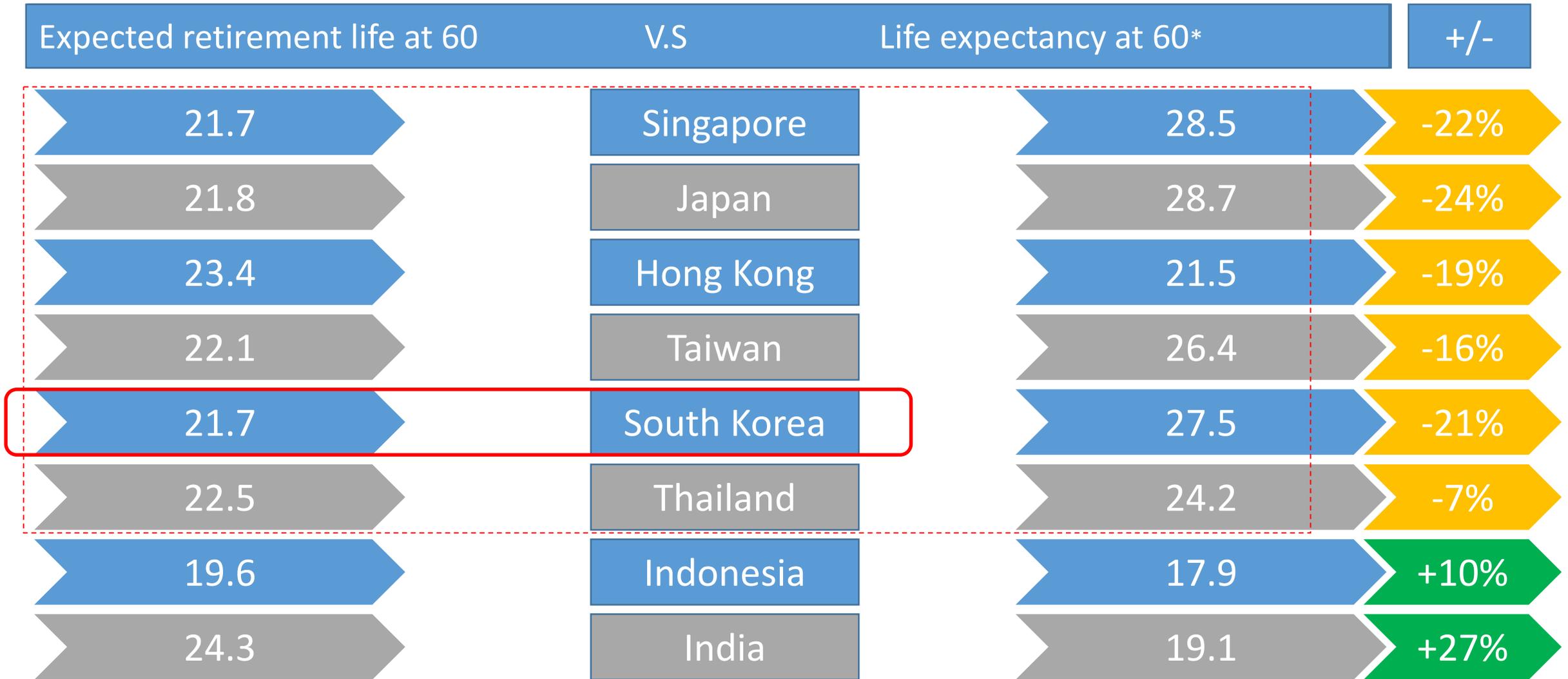
# HUGE GAP in retirement funds



How much of retirement funds do you anticipate to have/had when you turn 60?

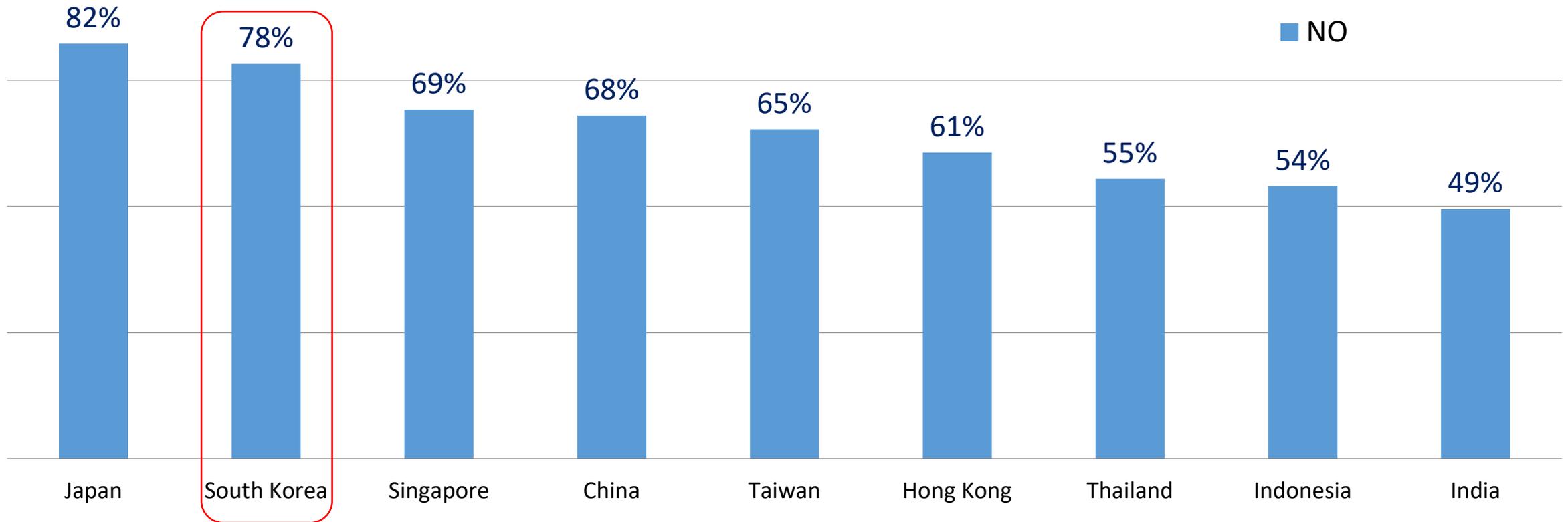


# How long do they expect to live after retirement?



# Majority do not seek help to create retirement plan

Did a financial professional help your household create a retirement plan?





# Majority do not seek help to create retirement plan

Did a financial professional help your household create a retirement plan?

Young Workers - 72%

Pre-Retirees - 84%

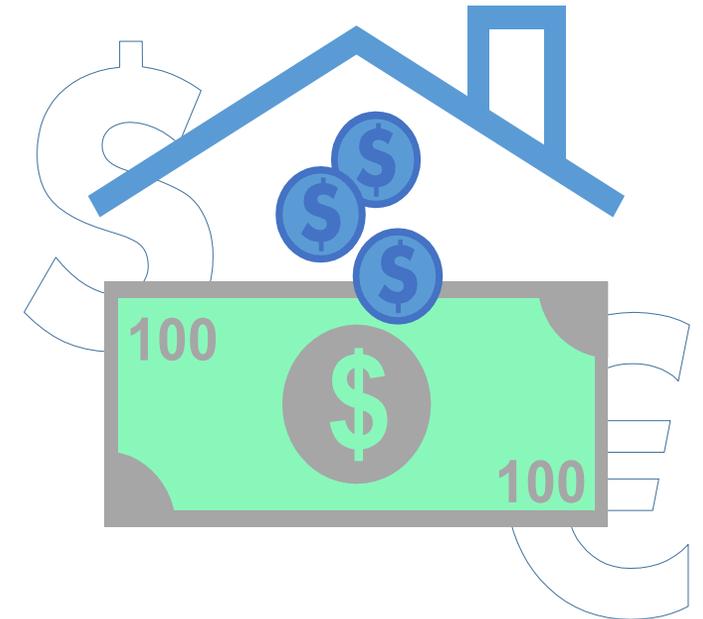
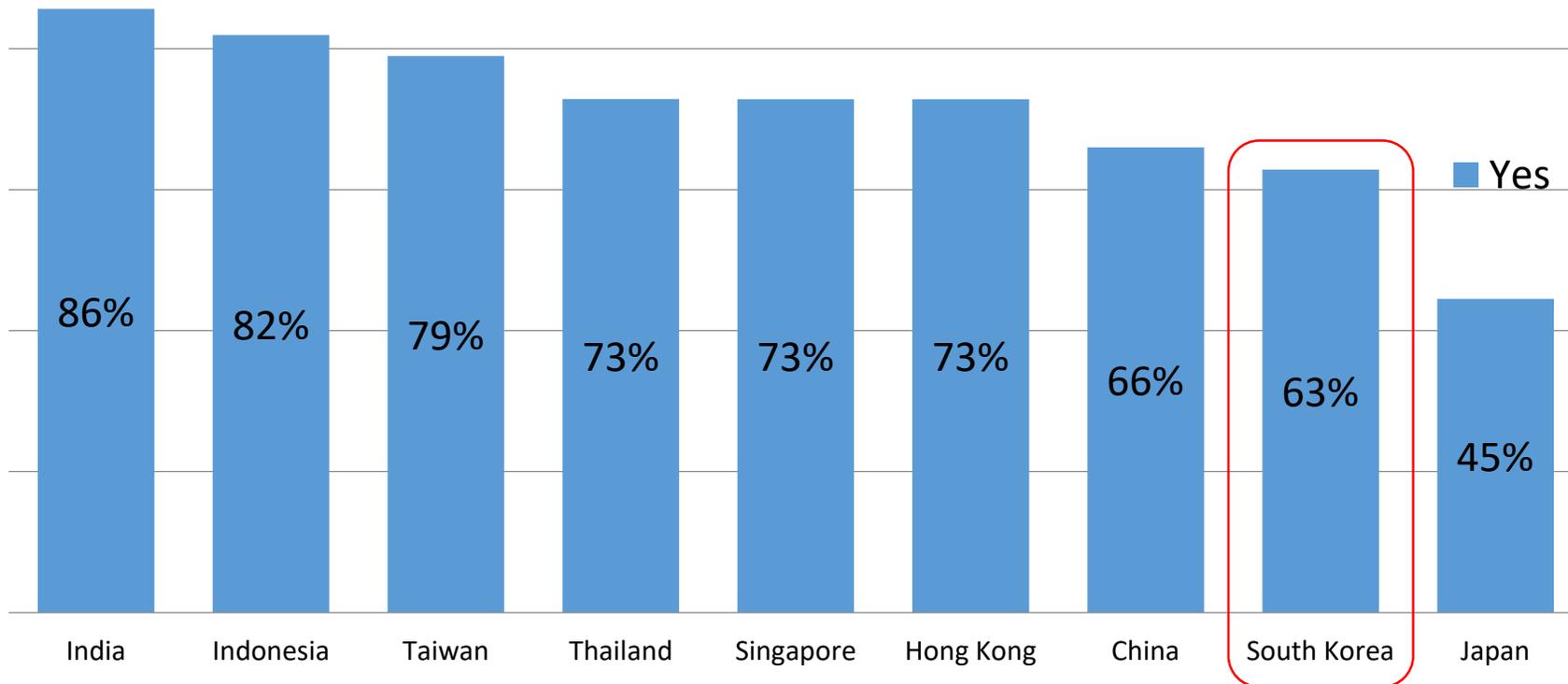
***Overall South Korea - 78%***

Retirees - 79%

Note: respondents who said **NO**

# Majority want to convert retirement assets into Annuity

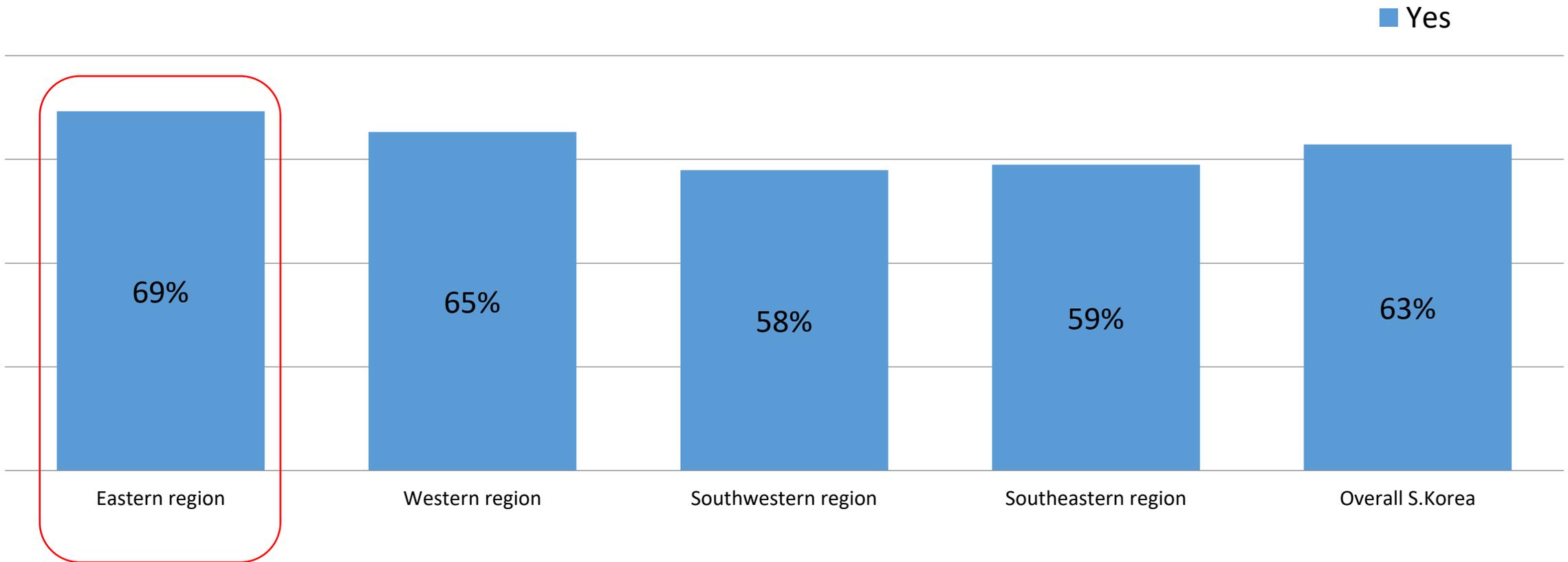
I would like to convert part of my retirement assets into buy Annuity product and create lifelong income stream



# Persons from Gangwon Area are more interested in annuities than others



Which Region of South Korea is more willing to convert a portion of their retirement assets into Annuities





# Desired Product Features

Which of the following product features are most important to you? (across markets)

- Income that is guaranteed for life
- Initial investment amount is preserved or protected
- Guaranteed returns on investments
- Control over how investments are managed
- Income amount can be changed as needs change
- Income will remain the same or fixed throughout retirement
- Income has the potential for growth with market

# Apart from guaranteed income, most are worried about inflation



Which of the following product features are most/least important to you?  
(Top 3/Bottom 3 South Korea)

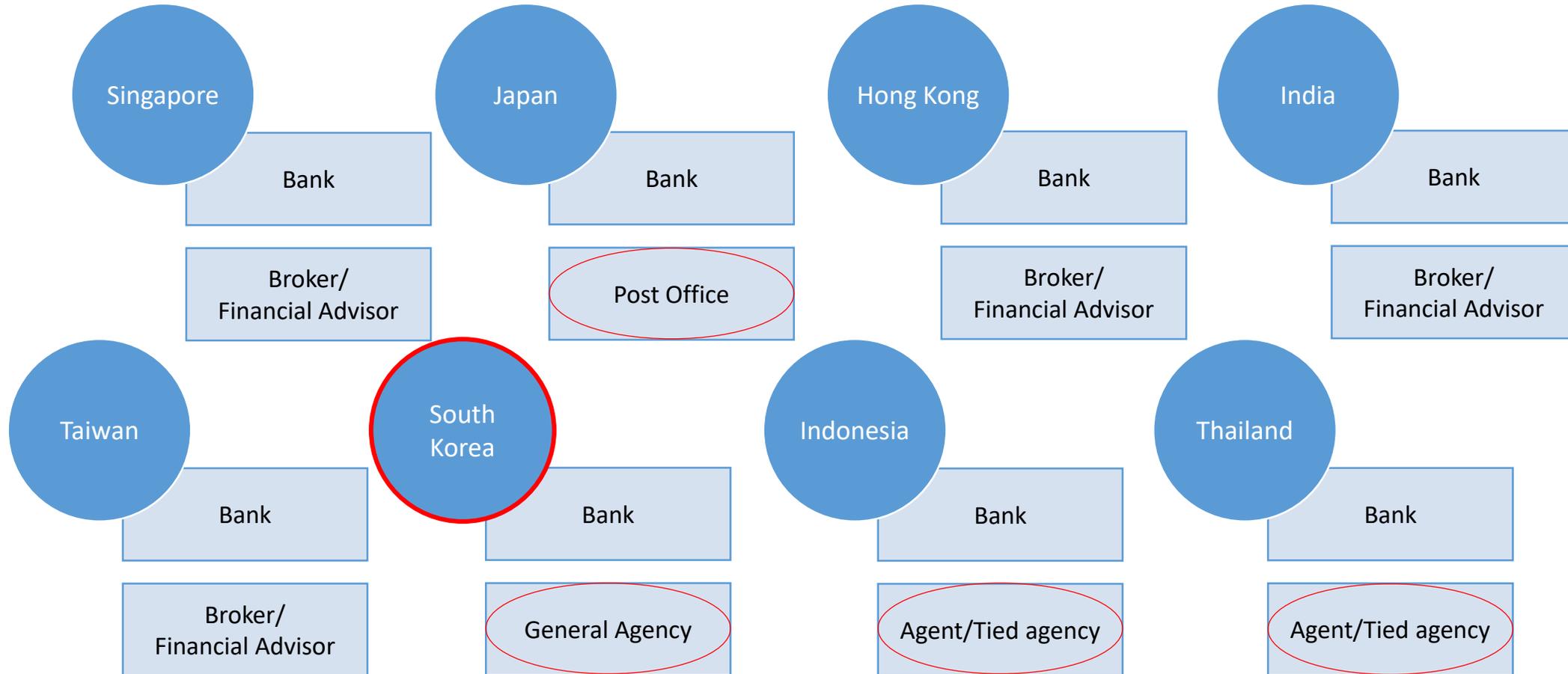


- Income that is guaranteed for life (Most preferred by Pre-retirees)
- Income will remain the same or fixed throughout retirement (Most preferred by Retirees)
- Income that is adjusted for inflation (Most preferred by Pre-retirees)

- Money for heirs or charities when I die (Least preferred by Retirees)
- Option to receive predefined lump sum or annuity payment in foreign currency (Least preferred by Pre-retirees)
- Single Premium (Least preferred by Retirees)

# Banks are the most preferred channel to buy

From where would you buy the product with the key features you selected (Top 2)





# Summary

- **Demography:** Elderly population will more than double; Speed of aging has reached unprecedented levels; individuals continue to underestimate longevity
- **Pension sustainability:** Under severe need to reform
- **Funding:** Individuals consider its their own responsibility to fund retirement, and not depend on government
- **Retirement planning:** Most start planning for retirement very late
- **Funding Gap:** Most are worried about the shortage of retirement funds but still do not seek professional help
- **Willingness to buy:** On the bright side people want to buy financial products (annuities), through banks and other channels

# Silver Lining to the Silver Tsunami?

Crisis is the  
mother  
of Innovation

