NTA First Workshop, 17-28 Oct. 2005

Demographic Dividends and Population Aging in Japan

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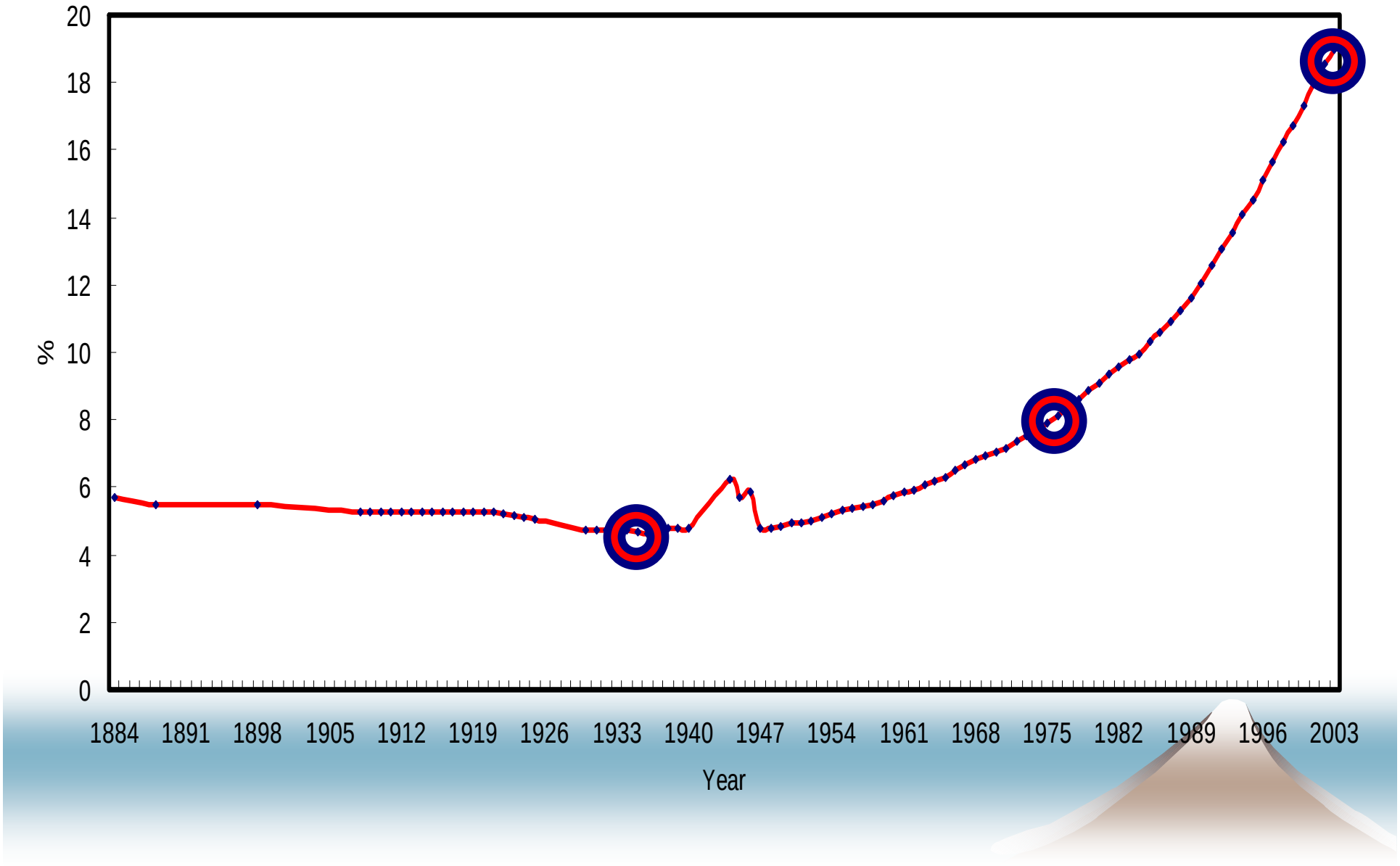
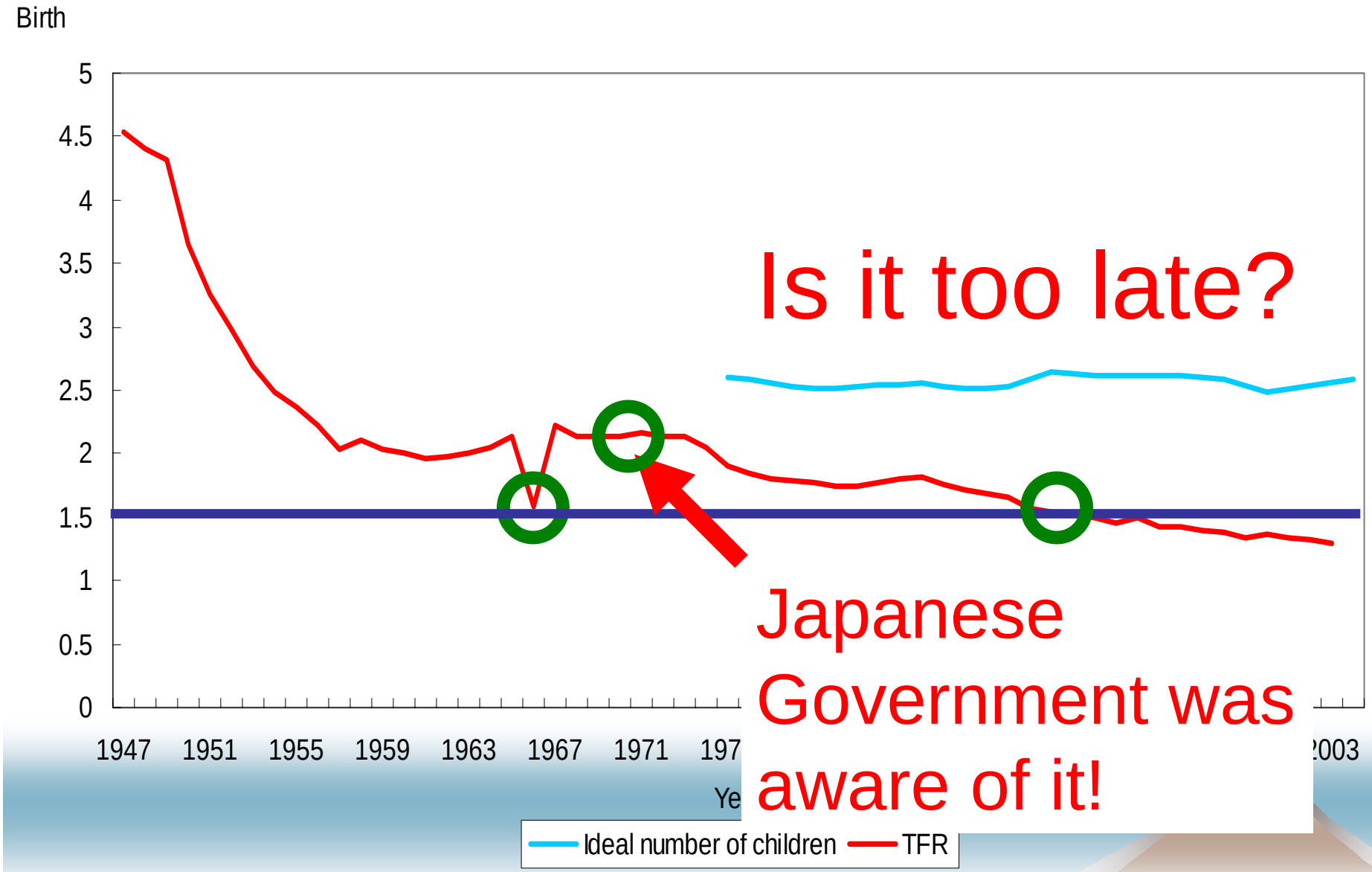
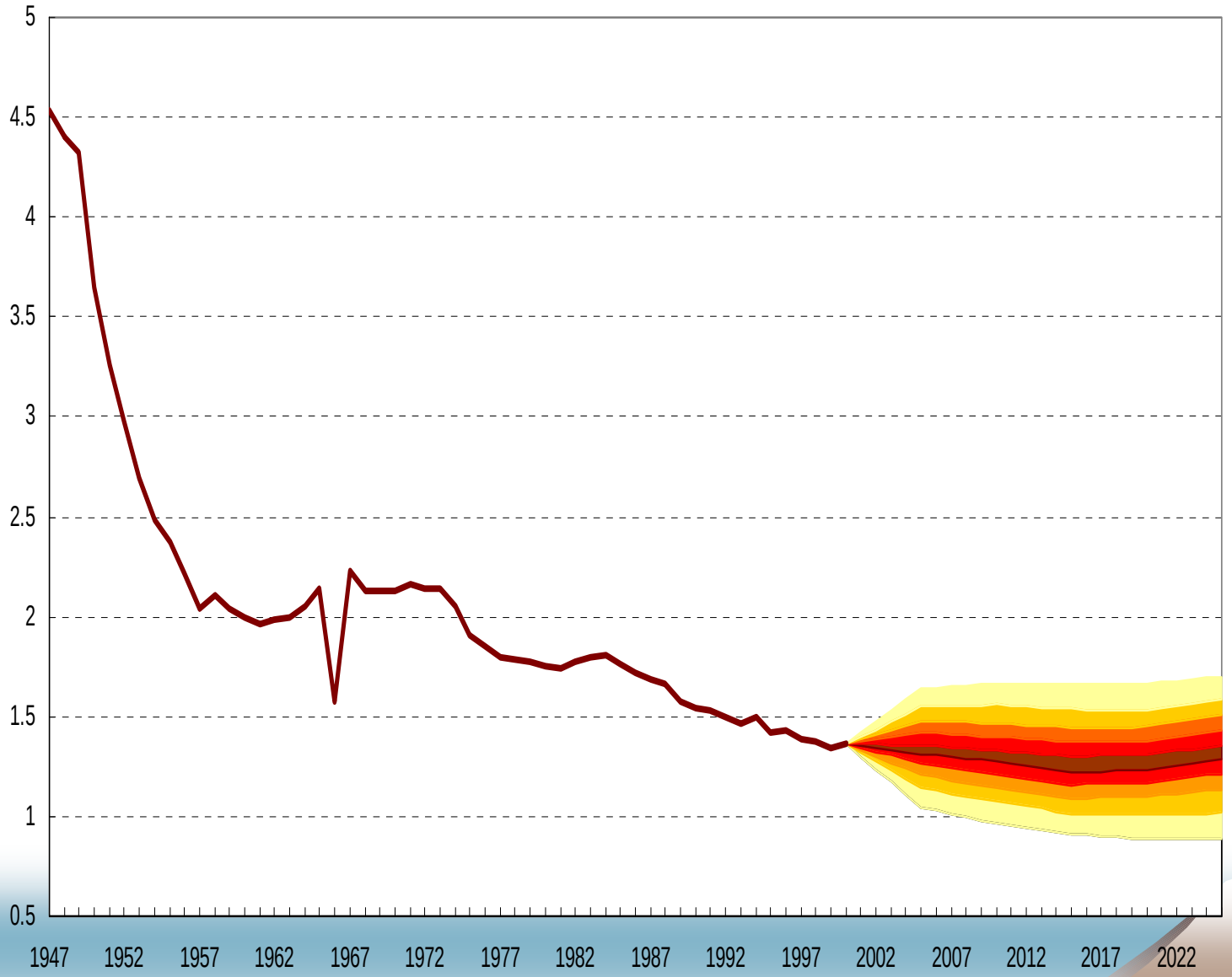
Proportion 65 and over



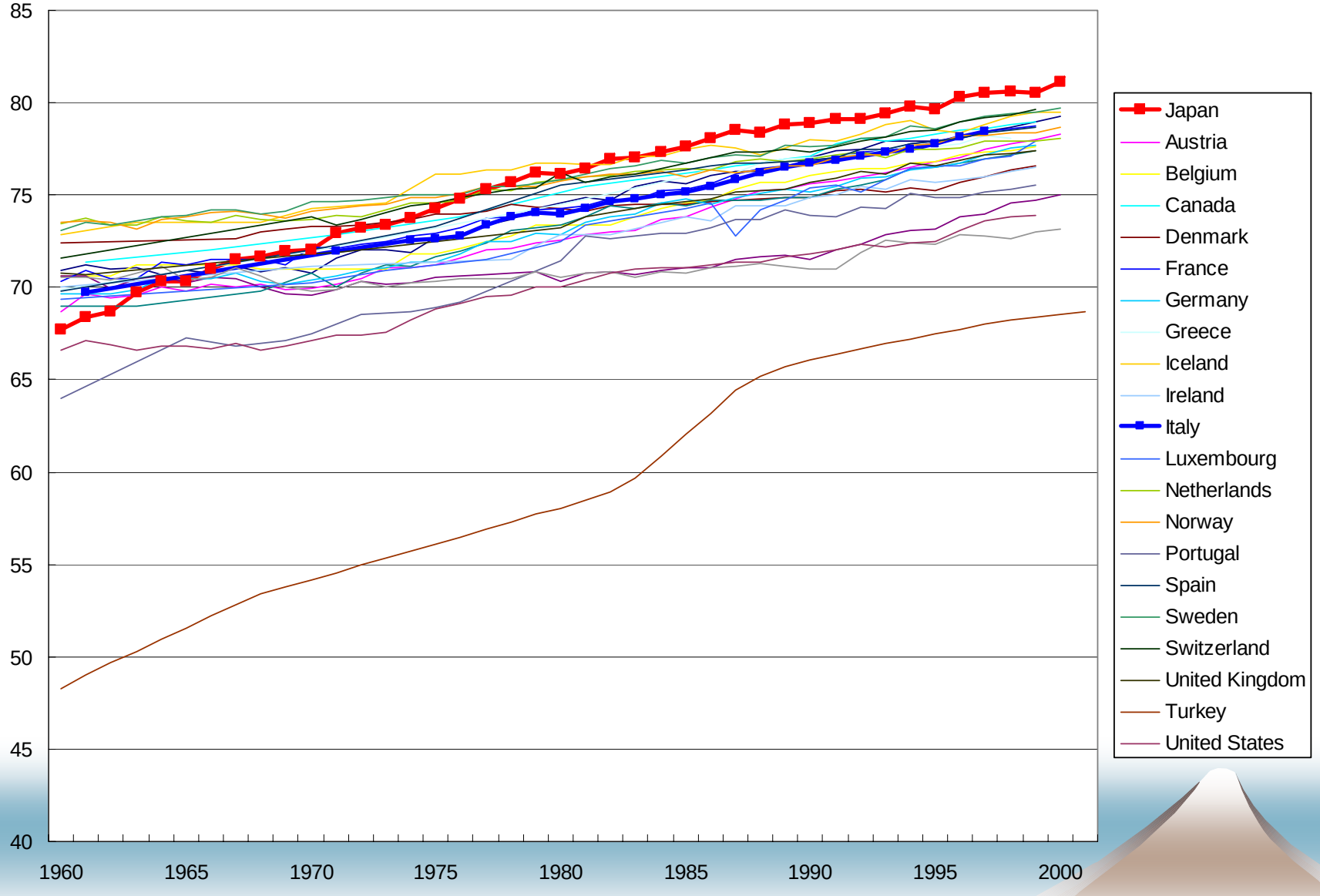
Total fertility rate (TFR) and ideal family size, Japan, 1947-2004

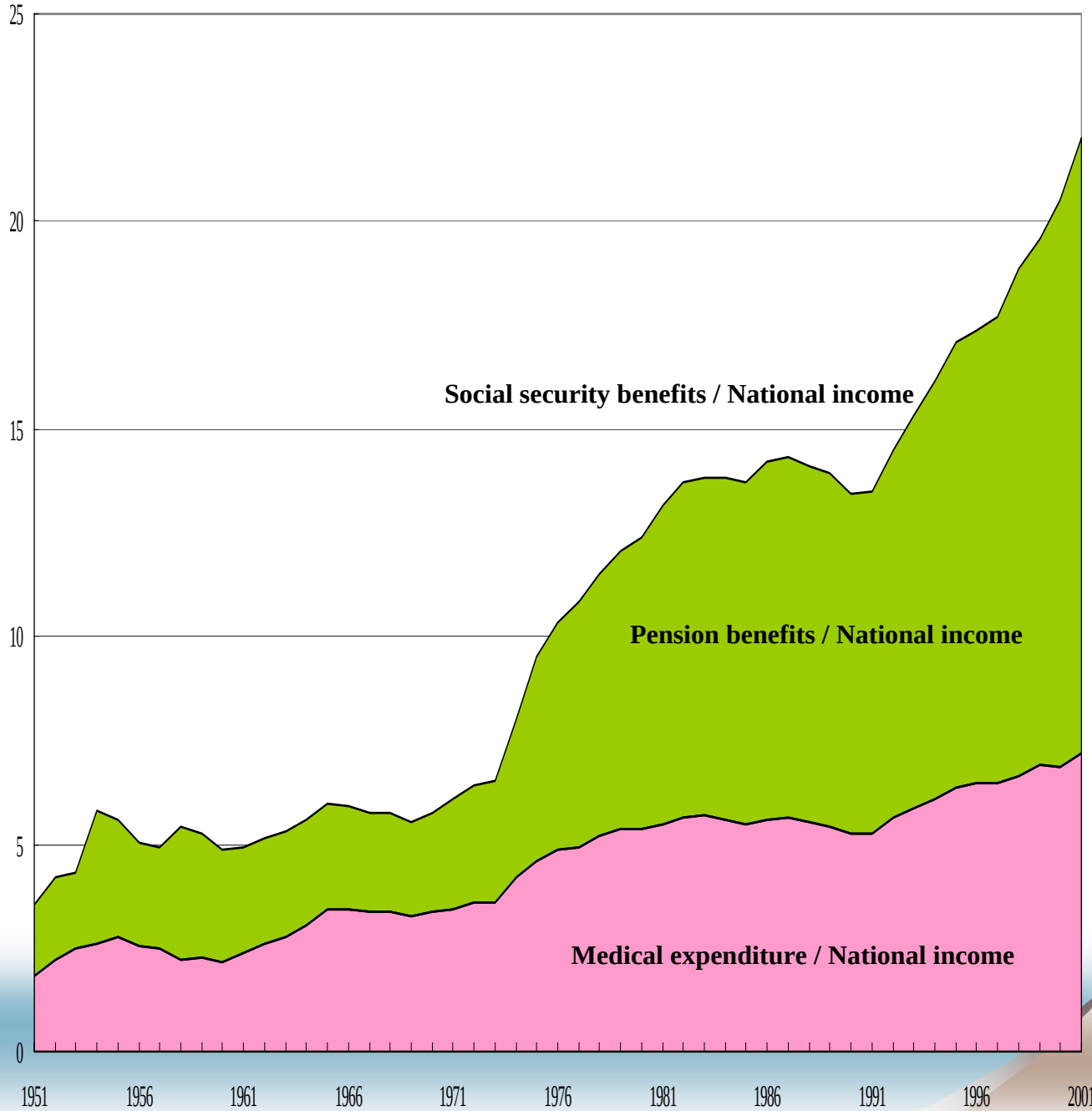


Stochastic forecast of TFR

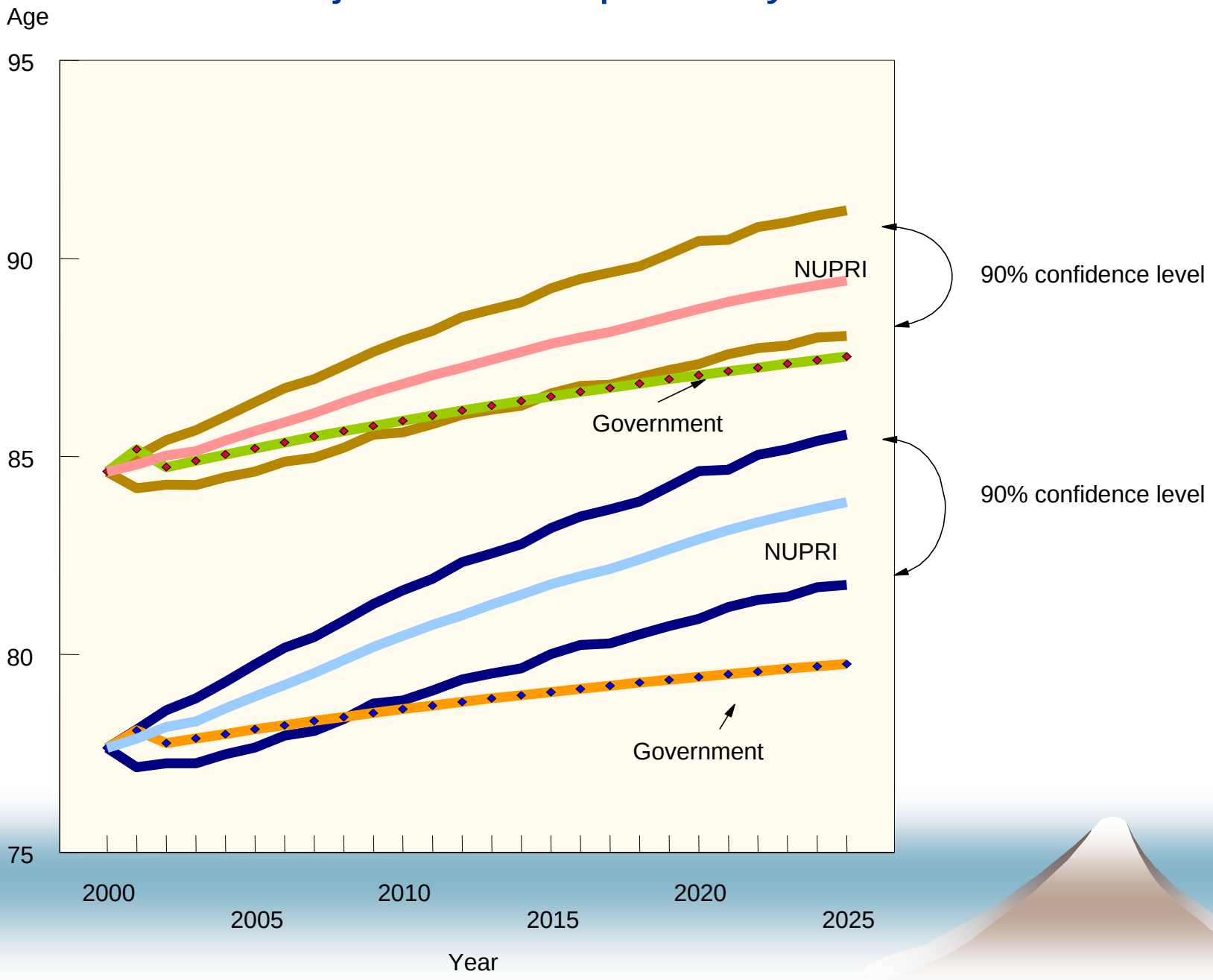


Trend in life expectancy at birth in OECD countries, both sexes combined, 1960-2001

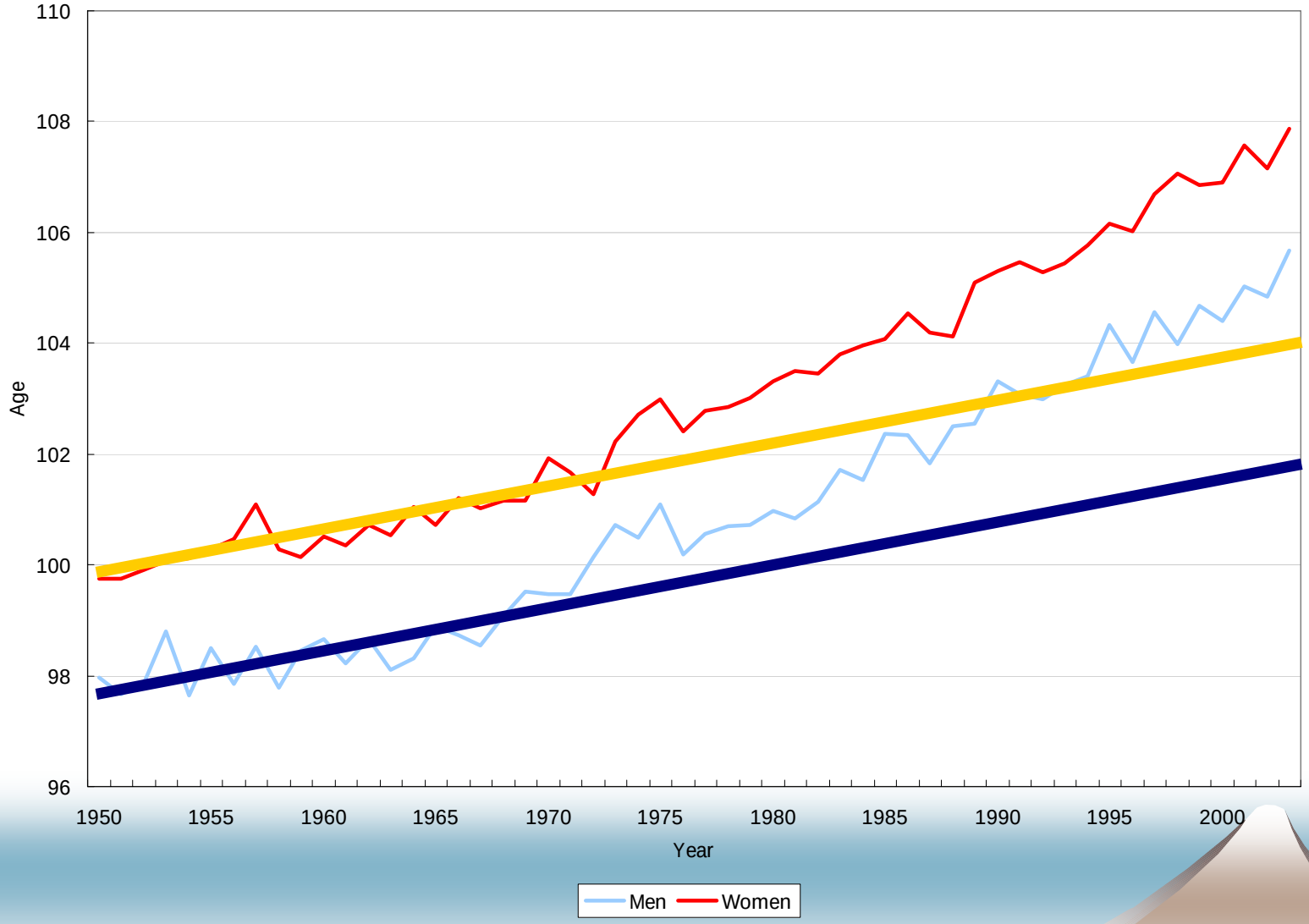



25
20
15
10
5
0
Social security benefits / National income
Pension benefits / National income
Medical expenditure / National income
1951
1956
1961
1966
1971
1976
1981
1986
1991
1996
2001

Projected life expectancy at birth

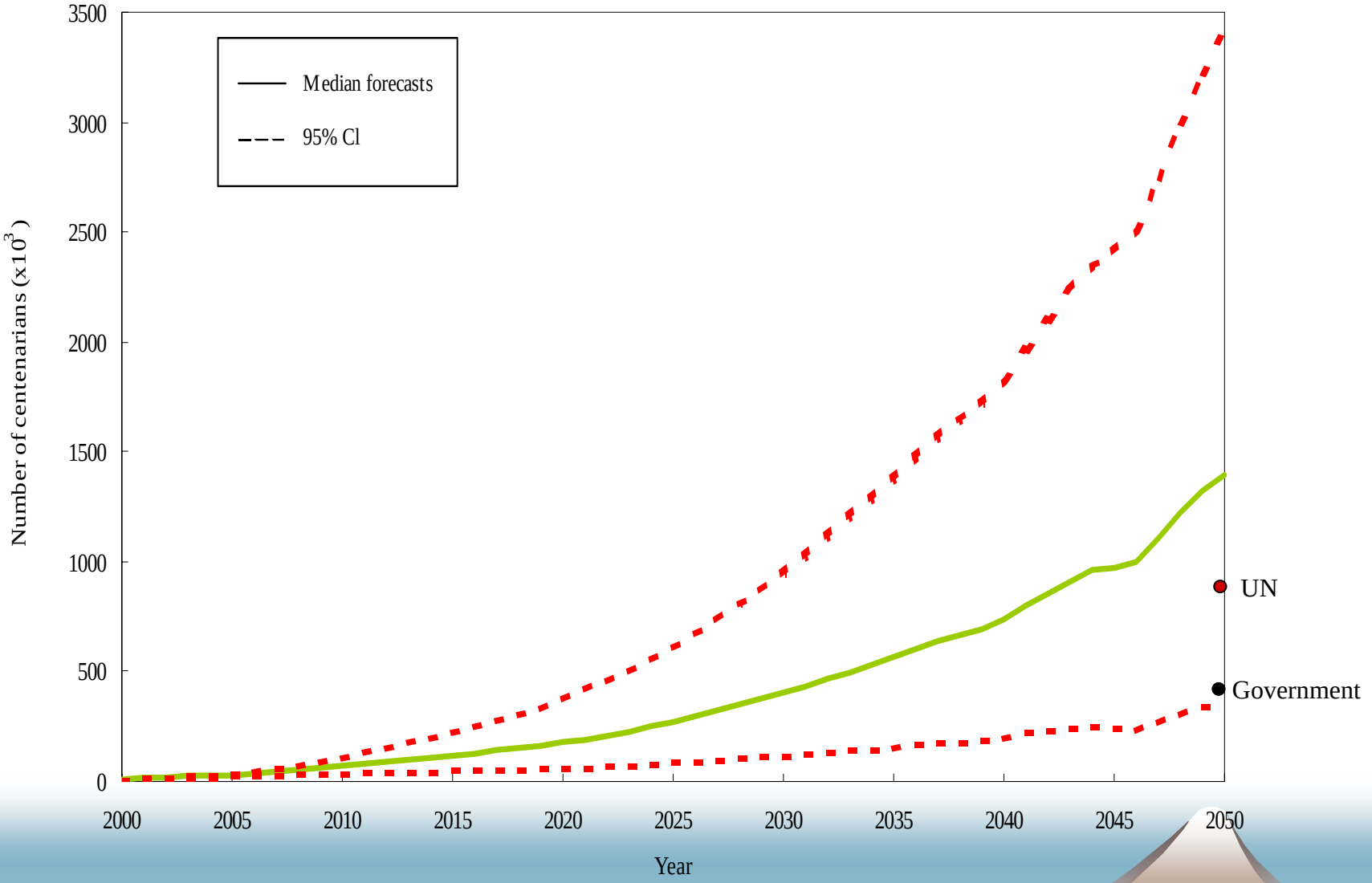


Change in average age of death among 50 oldest persons in Japan, by sex, 1950-2003



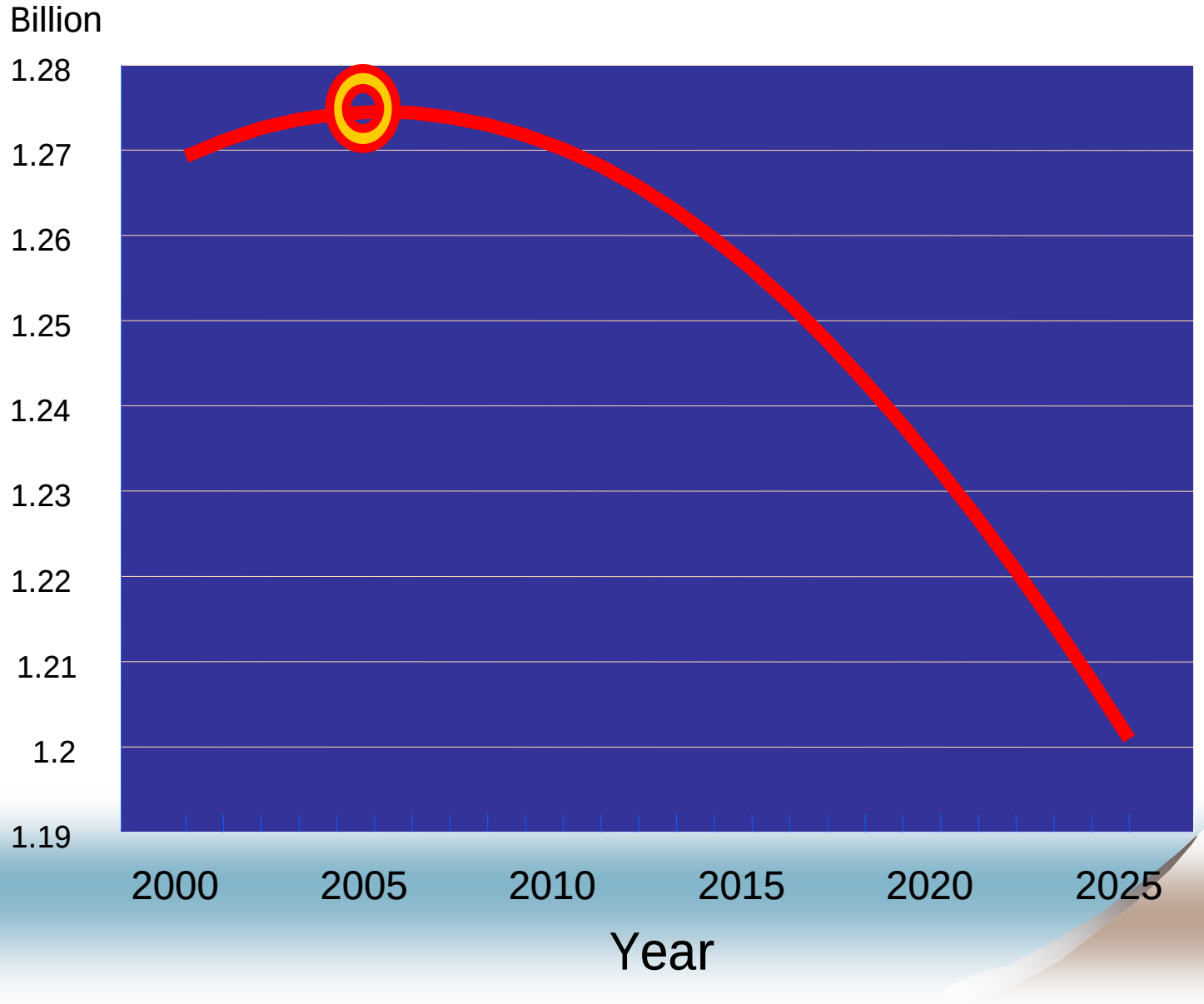
Source: Ministry of Health, Labour and Welfare, *Vital Statistics,* various years.

Forecast numbers of female centenarians



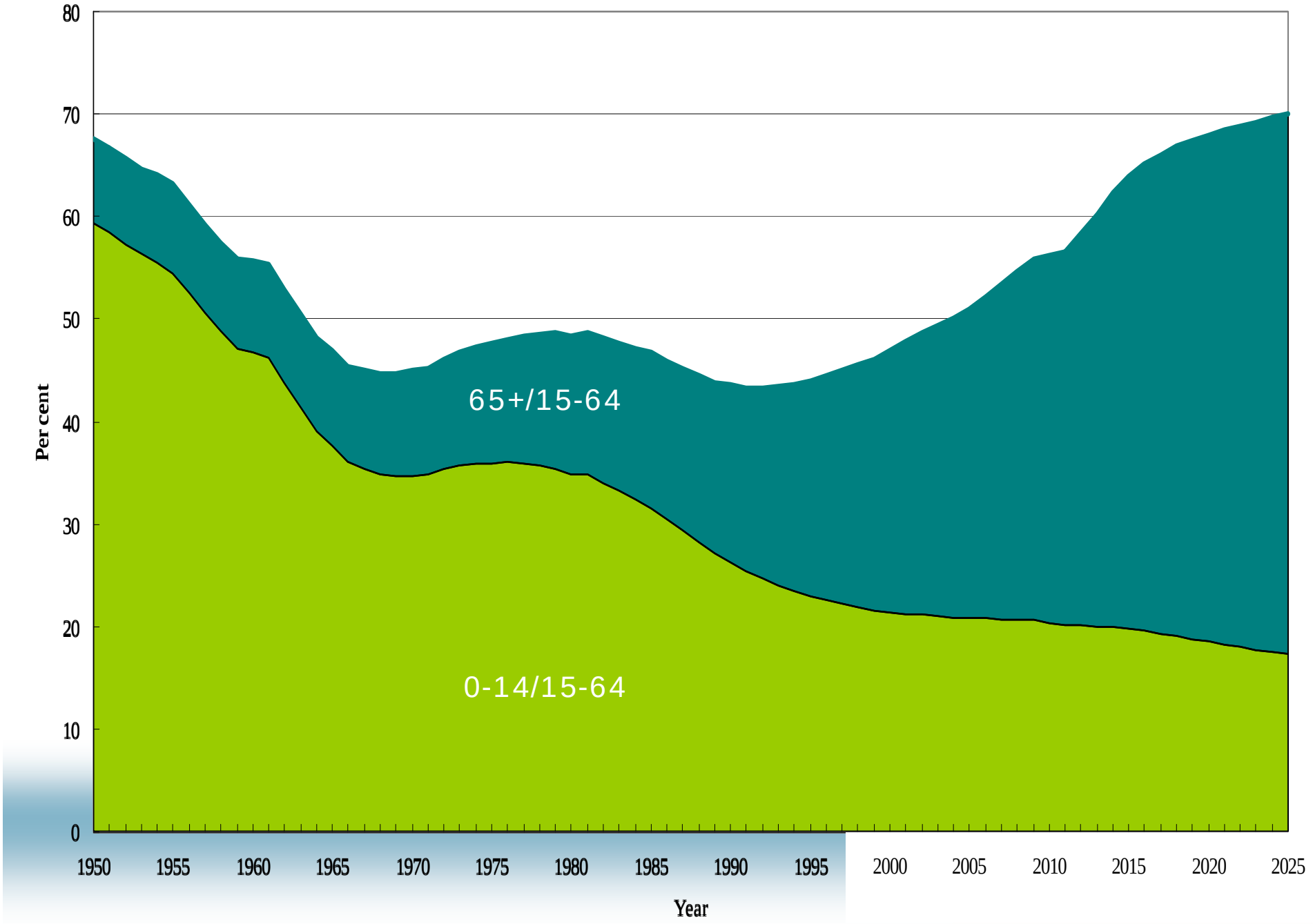
The Japanese population has just become the oldest in the world and has started to decline!

Projected total population, 2000-2025



And massive age structural shifts!

Age structural change: 1950-2025



Many ways to call gains derived from such age transformations

Demographic Bonus* or *Window of opportunity

(UNFPA, 1999; Birdsall and Singing, 2001; Merrick, 2002)

Demographic Gift

(Williamson, 2001)

Demographic Opportunity

(Fargues, 2001)

Demographic Golden Age

(Vallin, 2002)

Demographic Dividend

(United Nations, 2003)

Double Windows

(Chen and Lin, 2004)

First and Second Dividends

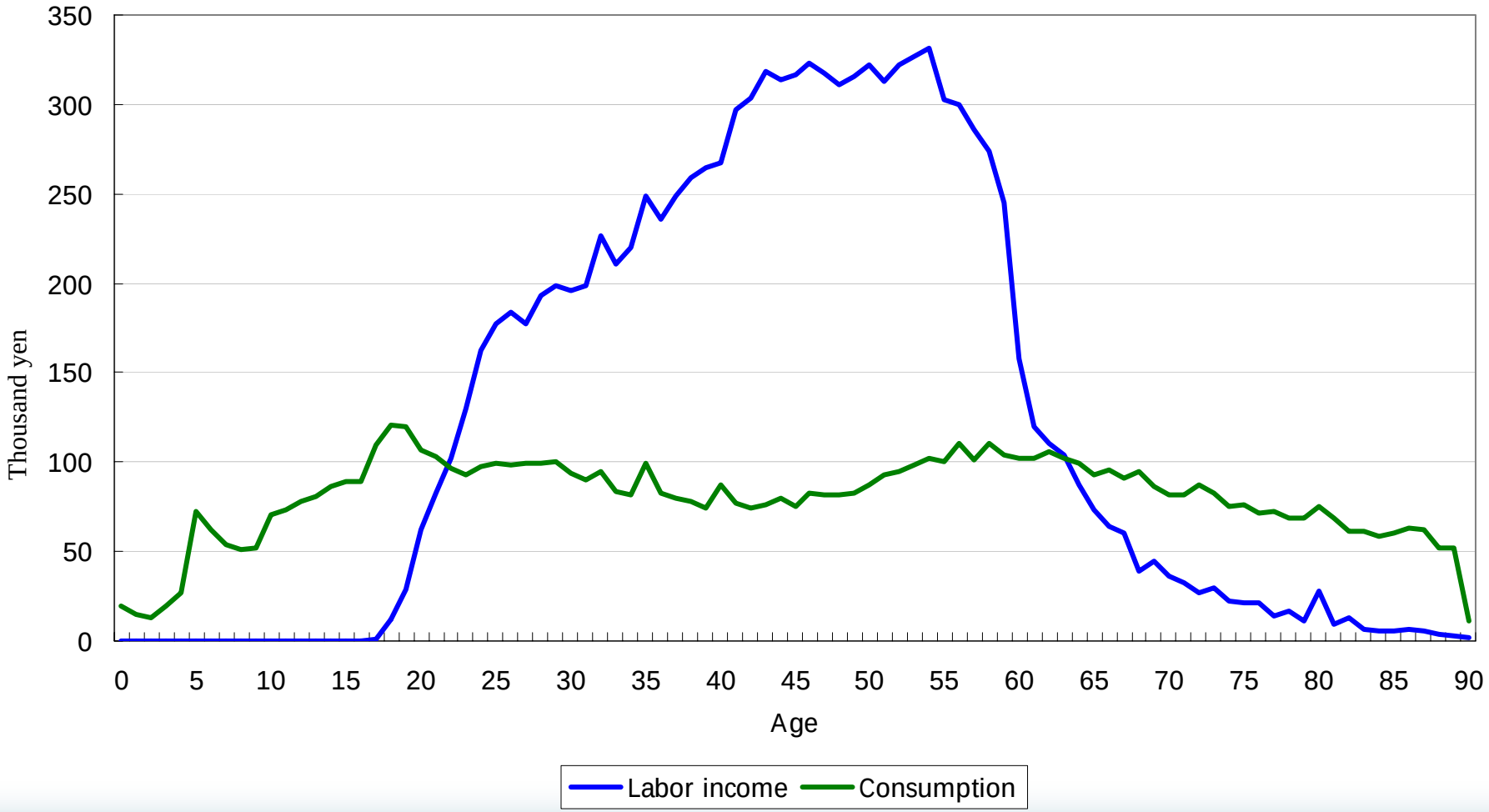
(Mason and Lee, 2005)

How big was Japan's first demographic dividend?

Here comes

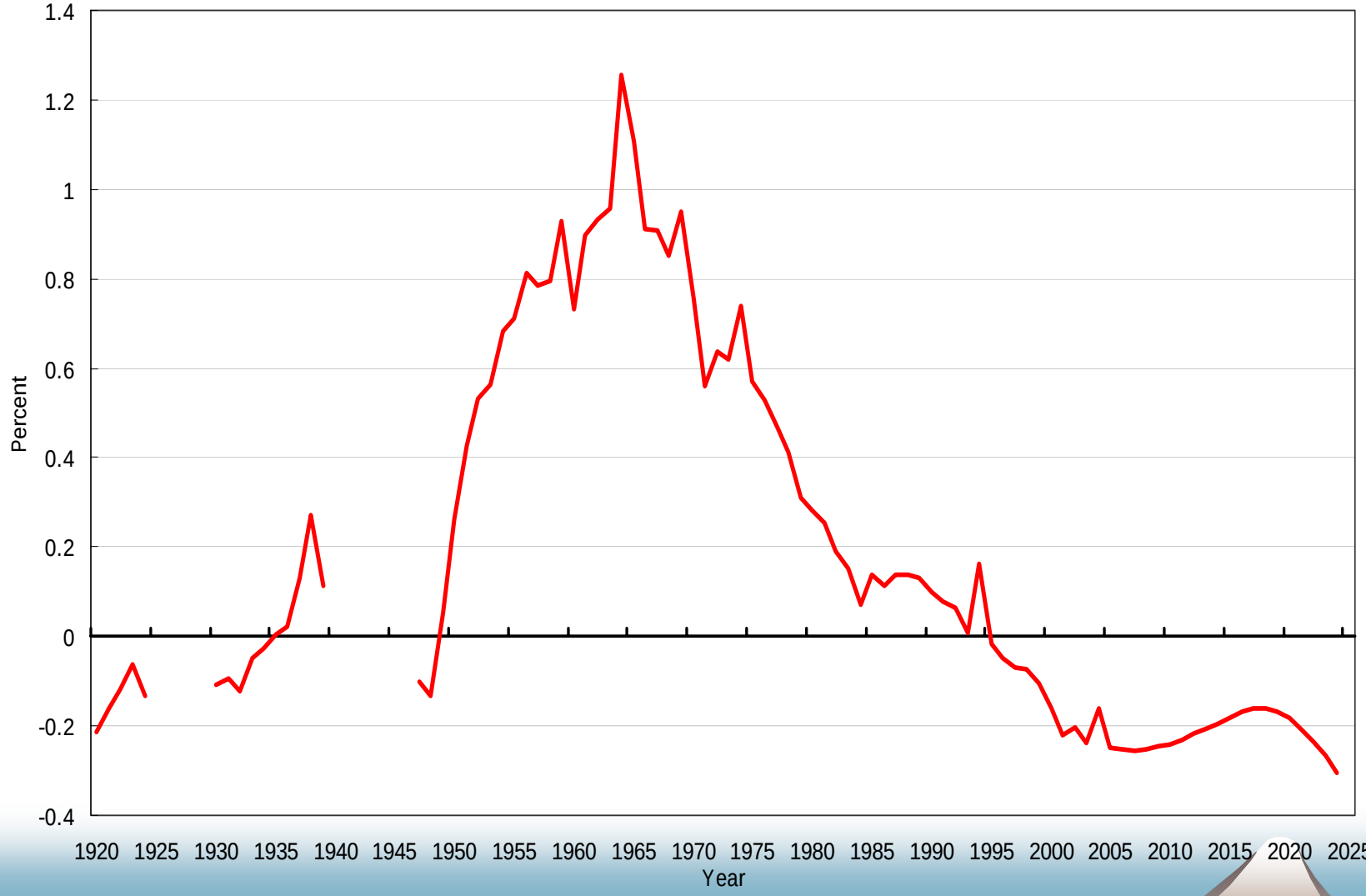
The most important graph in Japan!

Age specific profiles for labor income and consumption in Japan, 1999



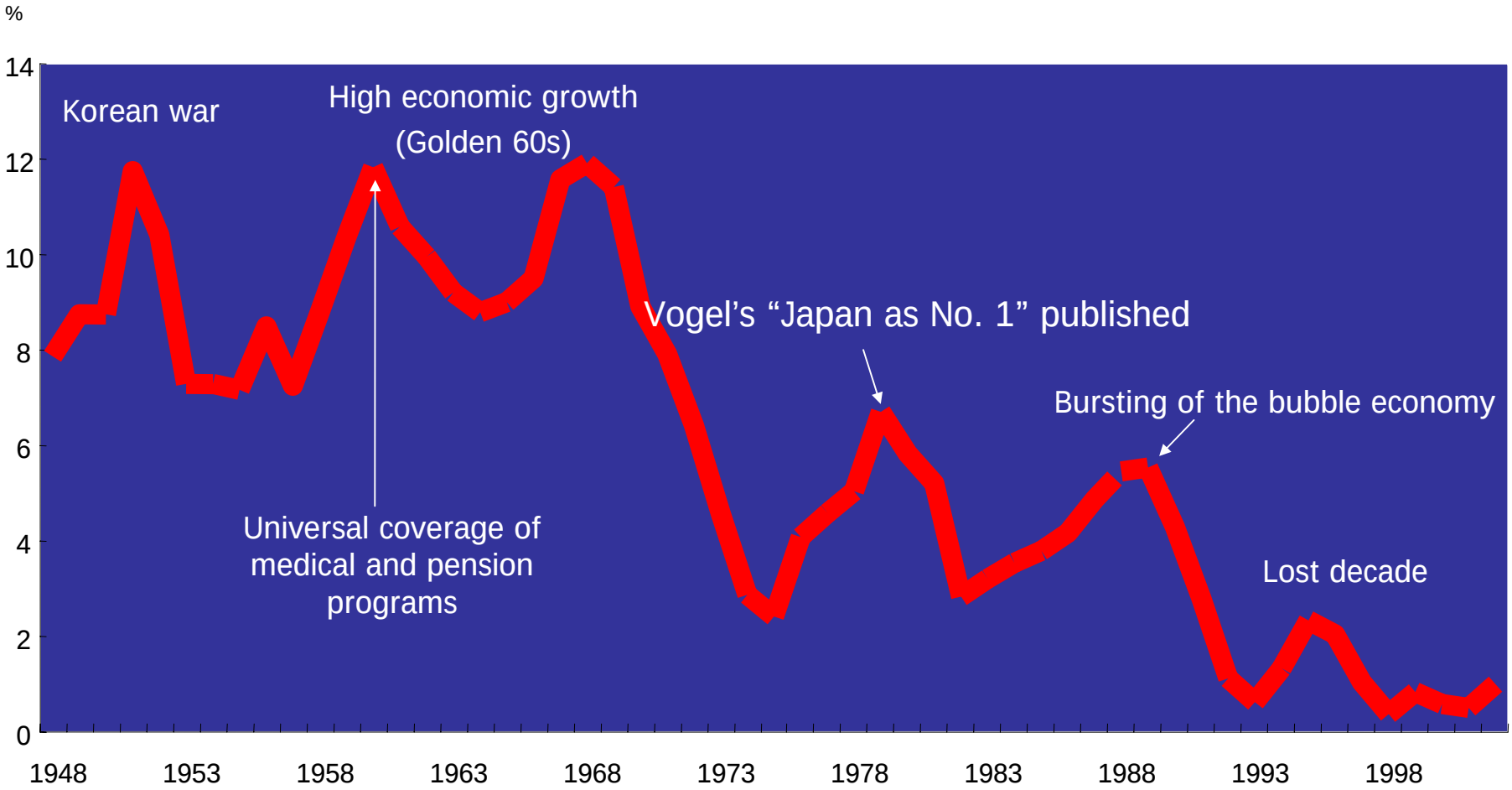
Source: Statistics Bureau, National Survey of Family Income and Expenditure, 1999.

Trend in first dividend in Japan, 1920-2025



Note: The first dividend is represented the support ratio which is defined as the difference between the annual growth rate of output per effective consumer and the annual growth rate of output per effective producer.

Trend in real GDP growth rate: Japan, 1948-2002



Note: Three-year moving average.

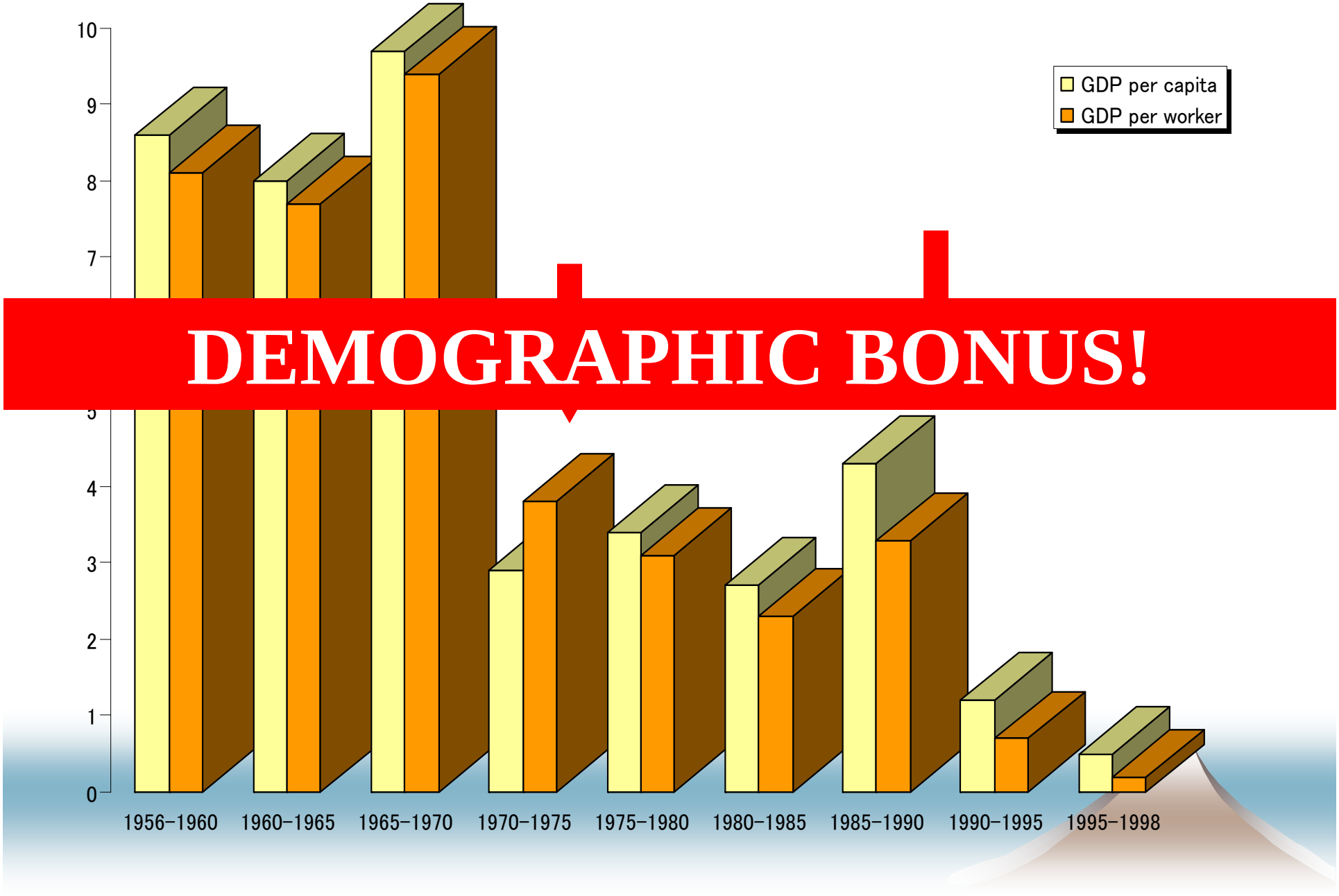
Source: Economic and Social Research Institute, Cabinet Office, Government of Japan, *Annual Report on National Accounts*, various years.

Another computation of demographic dividend, base on the Mason's 2001 book

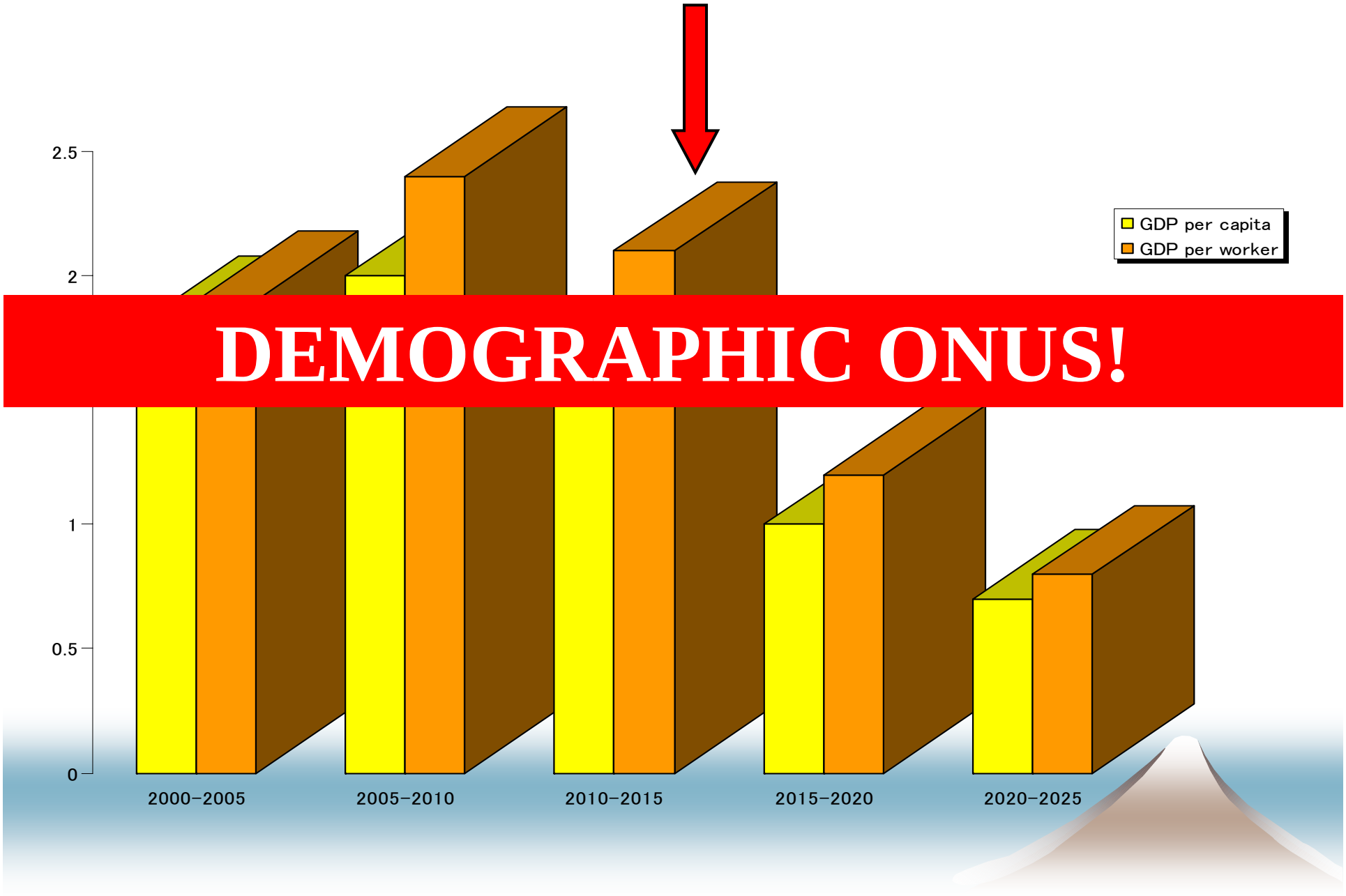
$$\frac{\dot{y}}{y} - \frac{\dot{y}^{l}}{y^{l}} = l - n$$

$$l - n < 0$$

$$l - n > 0$$



DEMOGRAPHIC BONUS!


2.5
2
1
0.5
0
GDP per capita
GDP per worker
2000–2005
2005–2010
2010–2015
2015–2020
2020–2025
DEMOGRAPHIC ONUS!

Difference is

workers

VS

effective workers

Japan's most important graph reflects a host of vital economic and social factors

Changing earnings profile

Hours worked

Women's labor force participation

Sectoral allocation of the labor force

Child care and old age leave

Change in retirement age

Change in the remuneration system

Pension benefits

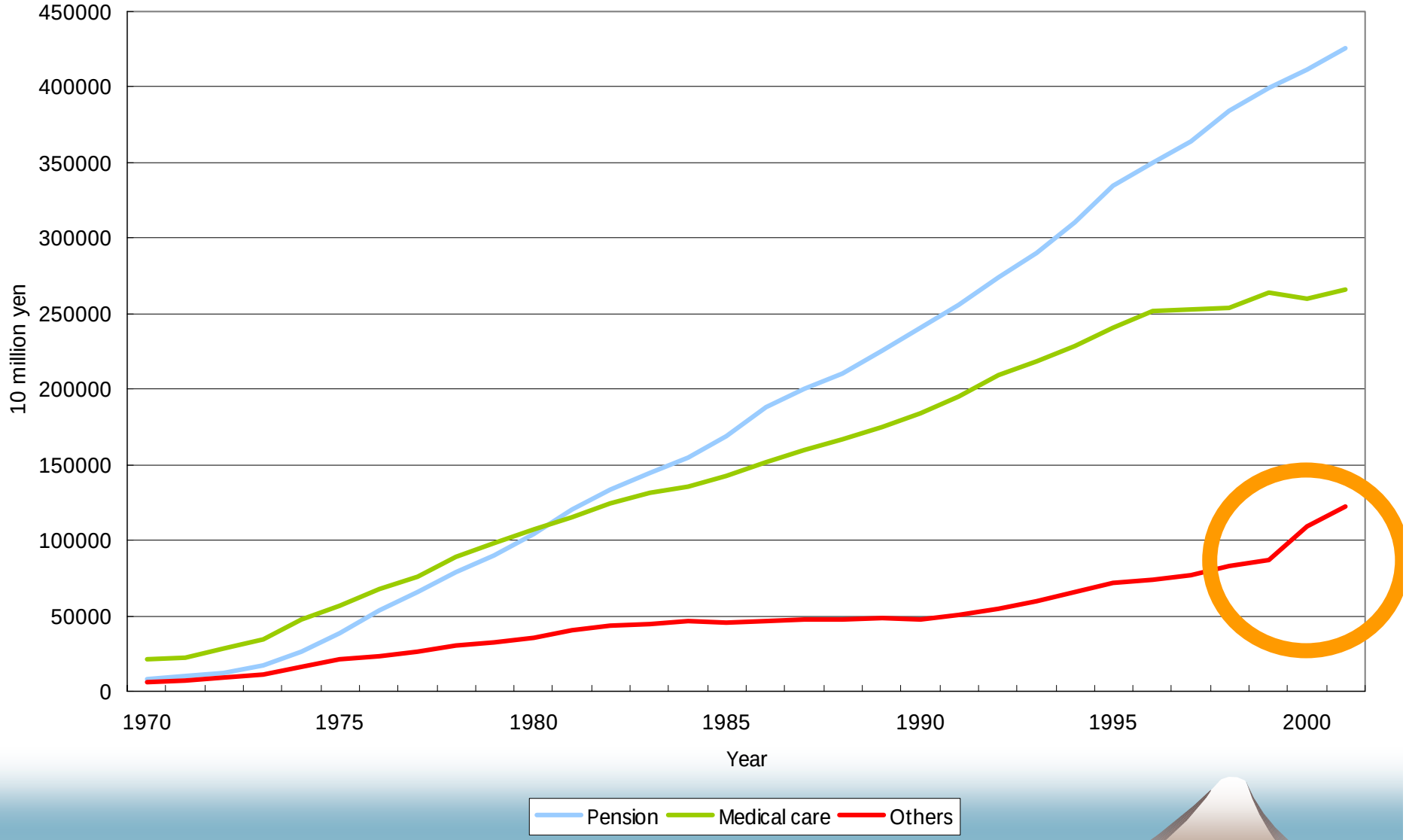
Enrollment rates in tertiary education

Parasite singles

Freeters and Neets

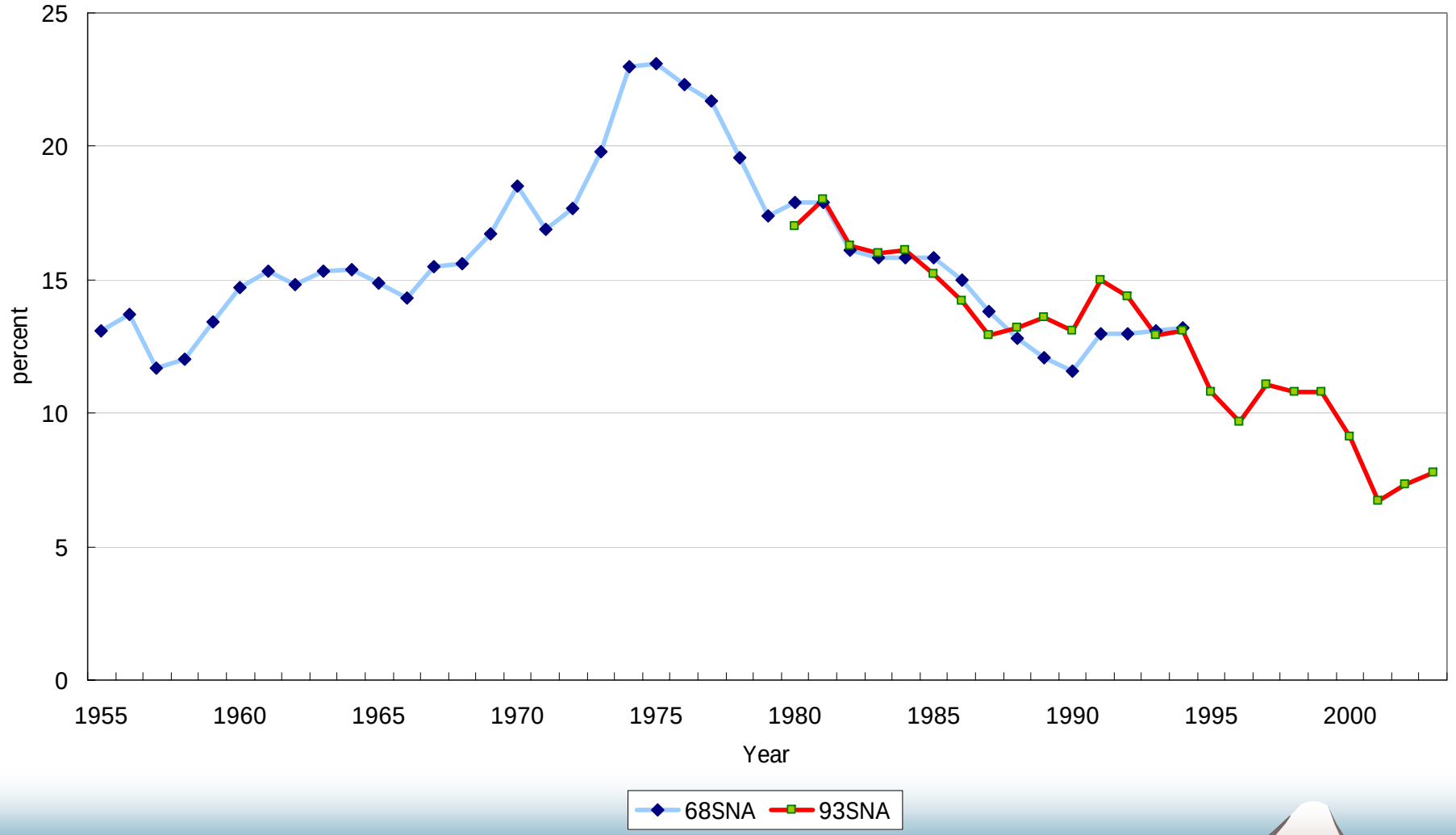
How was the first demographic dividend utilized during Japan's postwar economic development?

Change in composition of the Japanese social security system



Longer life expectancy generated the second demographic dividend!

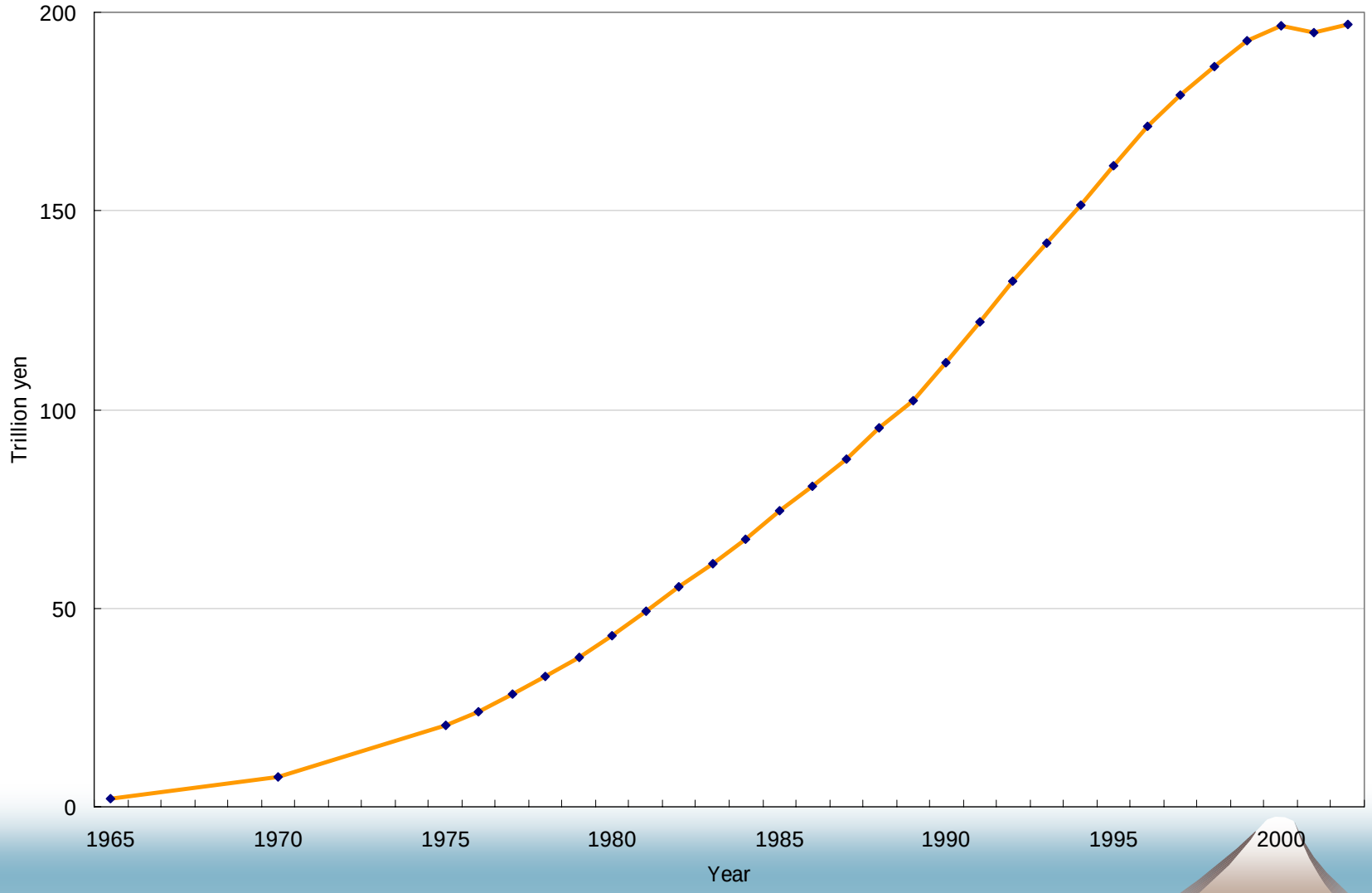
Change in the household savings rate in Japan, 1955-2003



Source: Cabinet Office, Government of Japan, *Annual Report on National Accounts,* Various years.

Savings rate = Net saving ÷ (Disposable income + Changes in pension reserves in pension funds)

Growth of reserved funds for all public pension schemes combined, 1965-2002



Source: Ministry of Health, Labour and Welfare, *Financial Report on the Public Pension System: Fiscal Year 2003*, 2004.

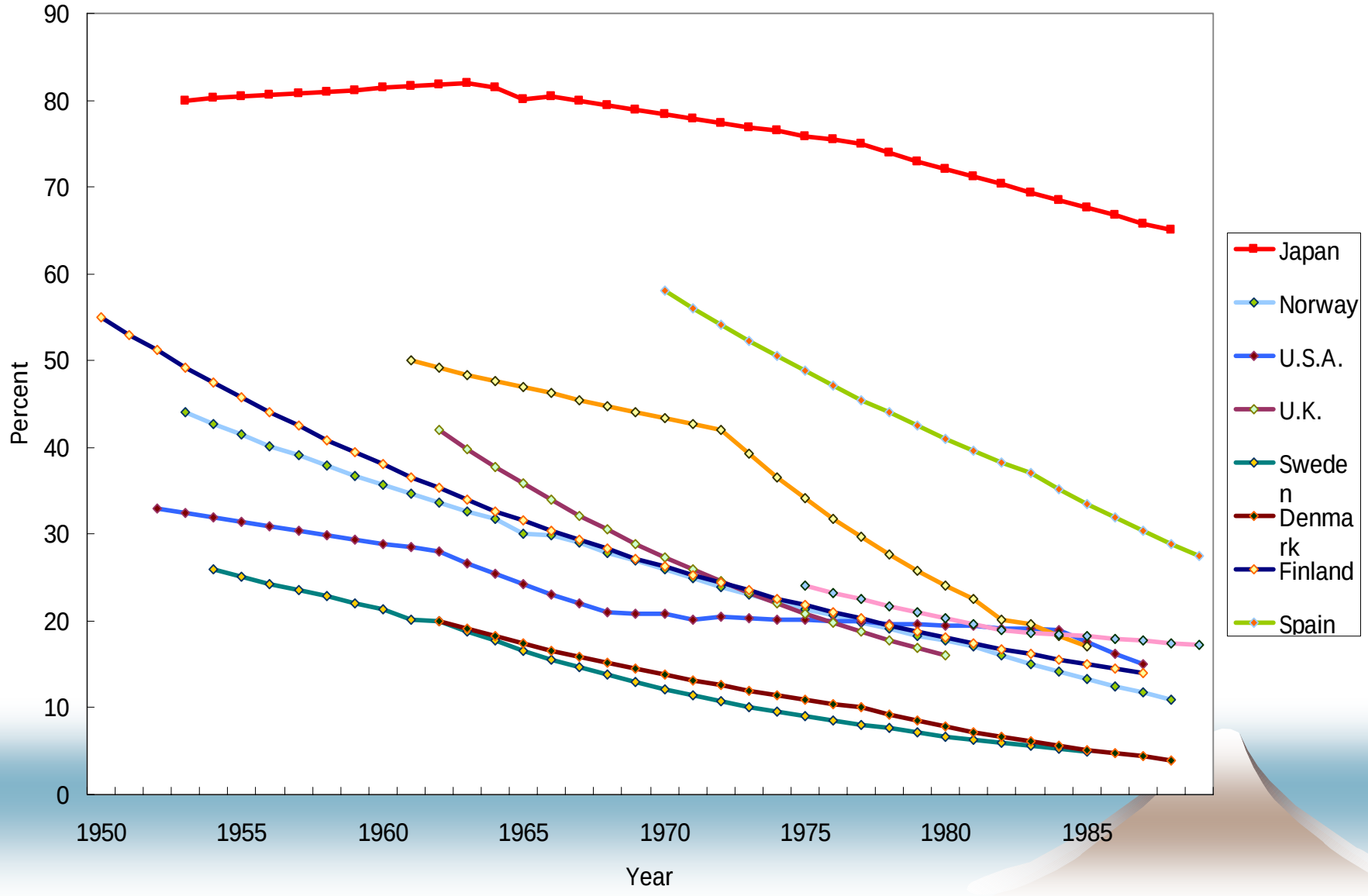
Periodic revision of pension schemes

2004 revision:

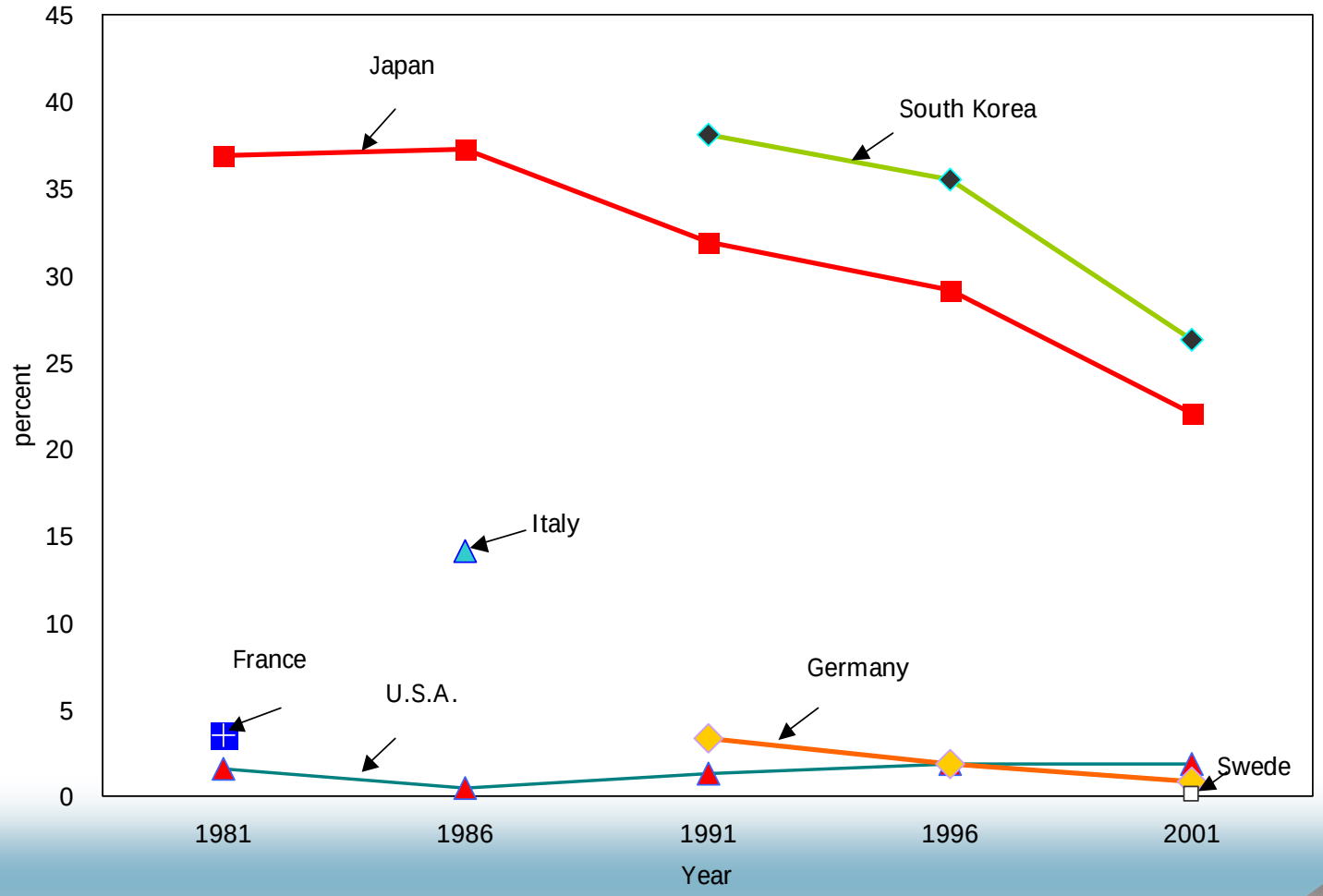
DB to DC

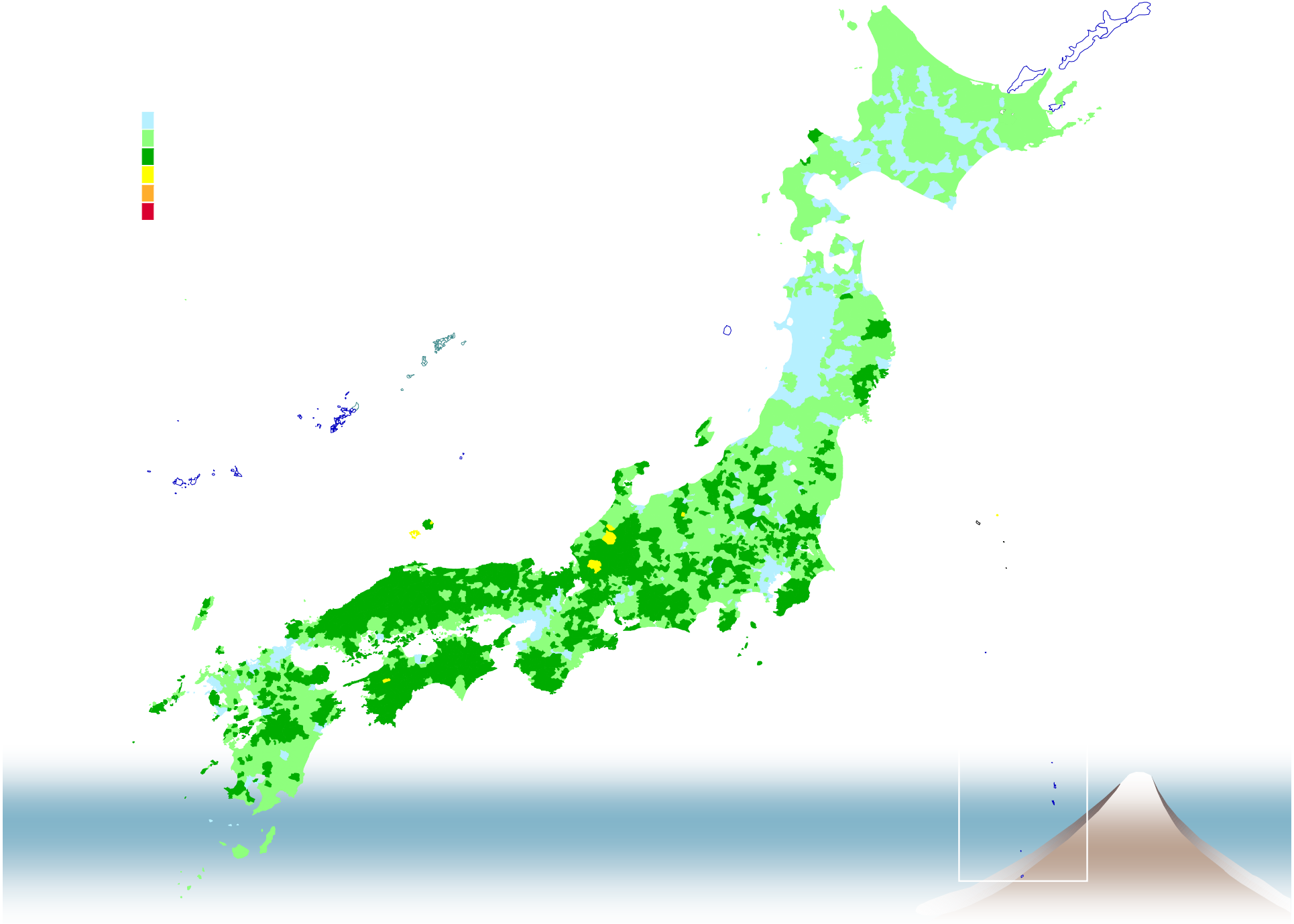
Changing family support !

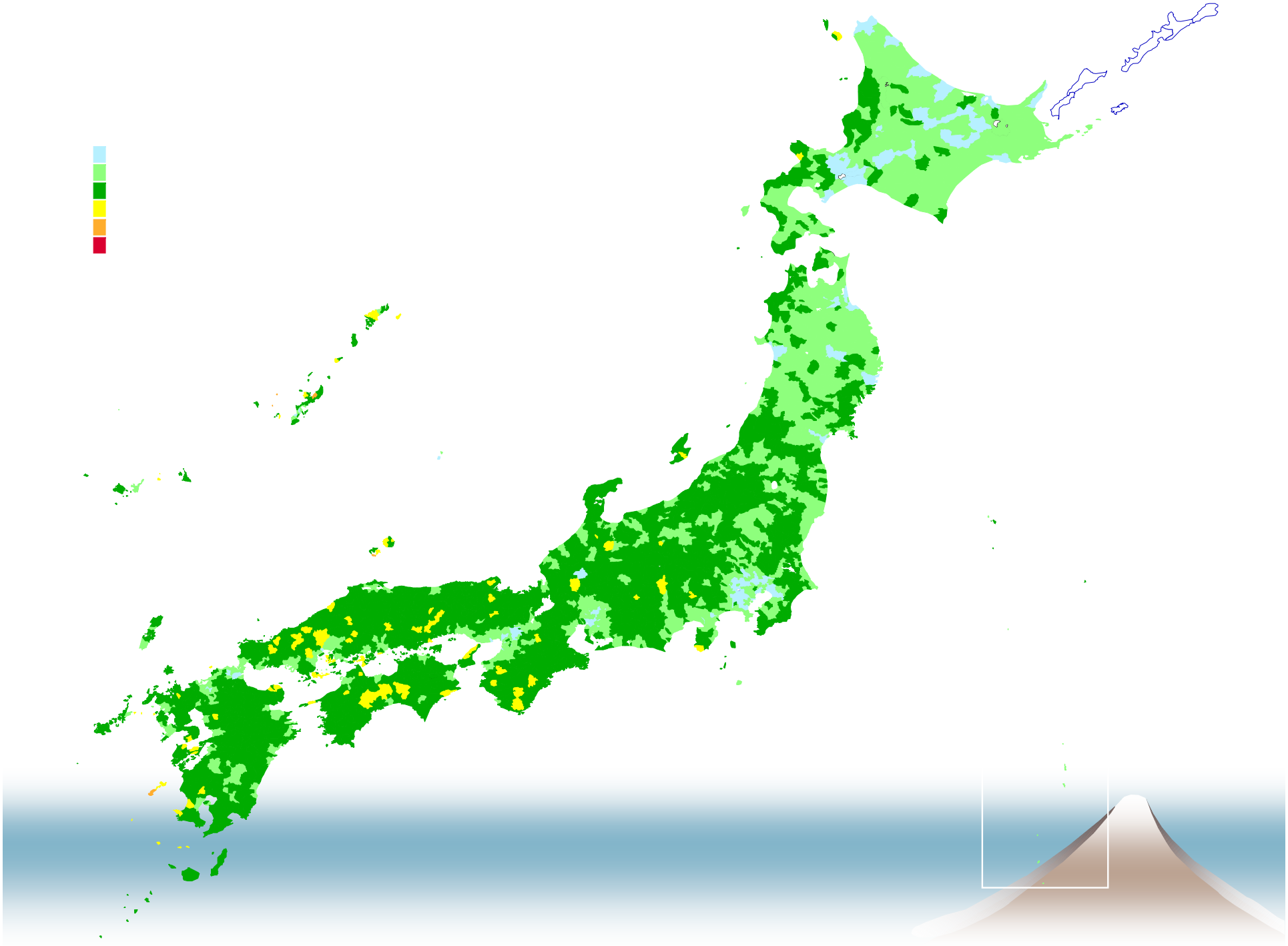
Percent of elderly aged 65 and older who coreside with children, Japan and other industrialized countries 1950-89

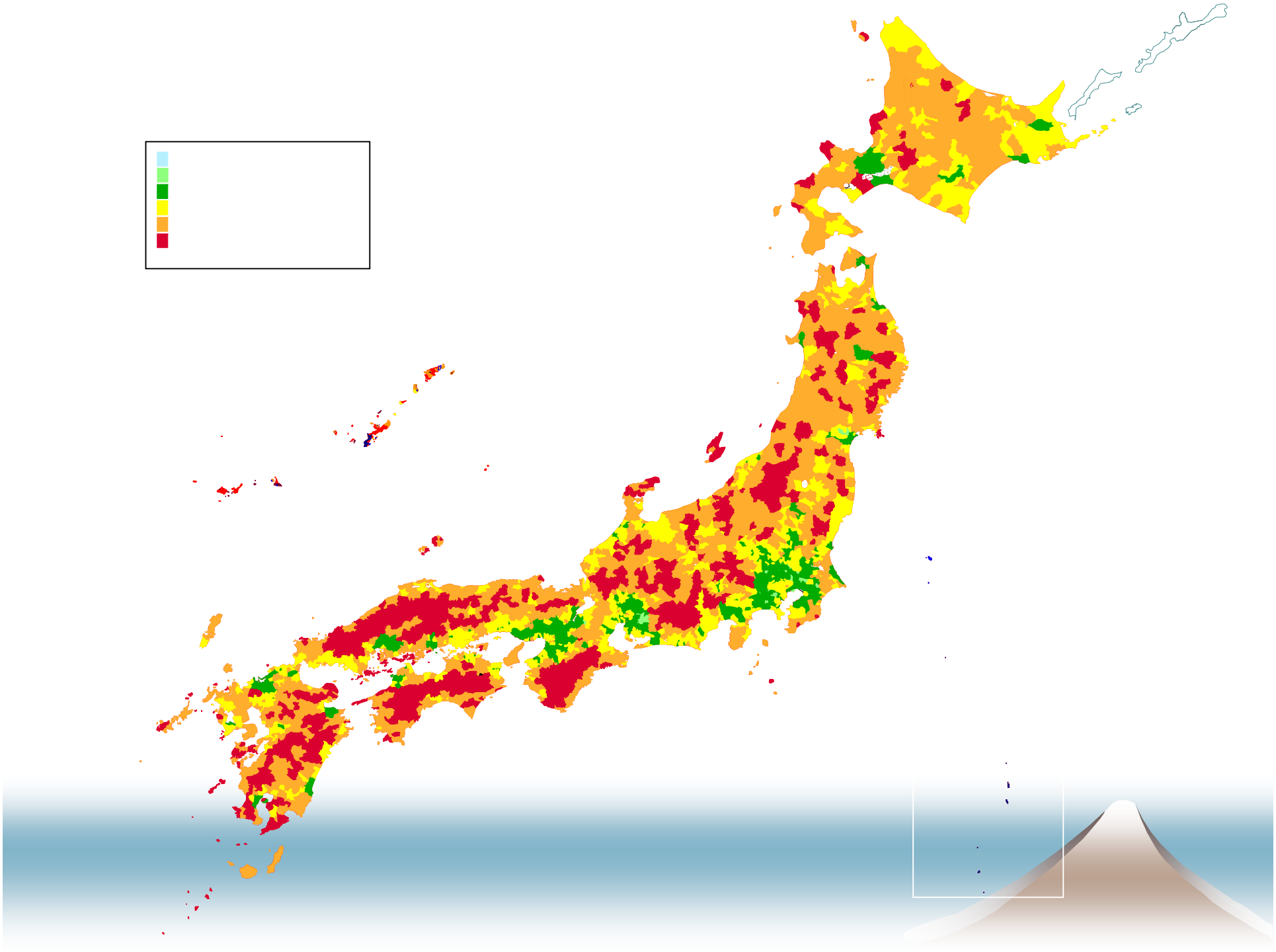


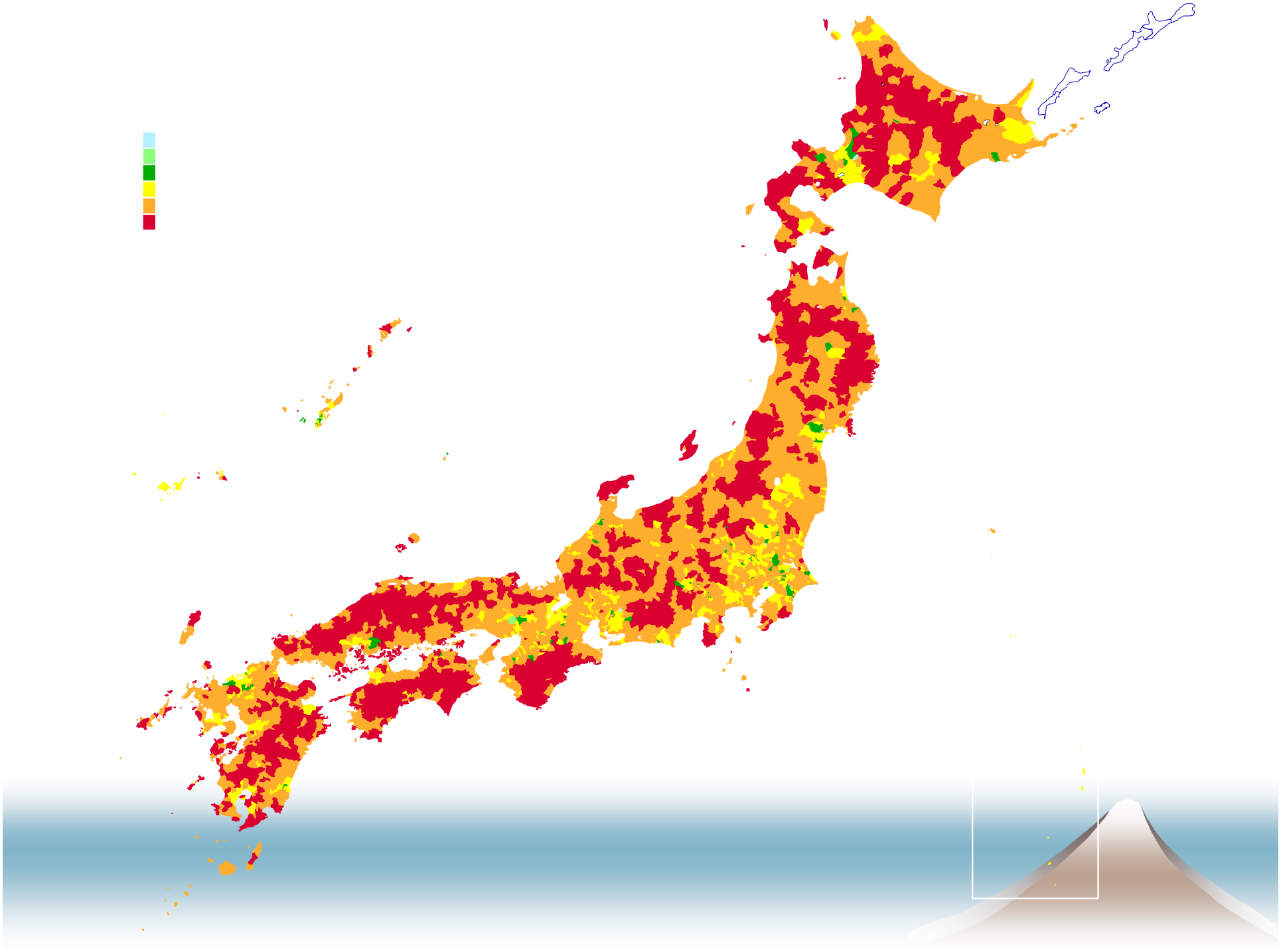
Change in the proportion of those 60+ living in three-generational households, selected countries, 1981-2001

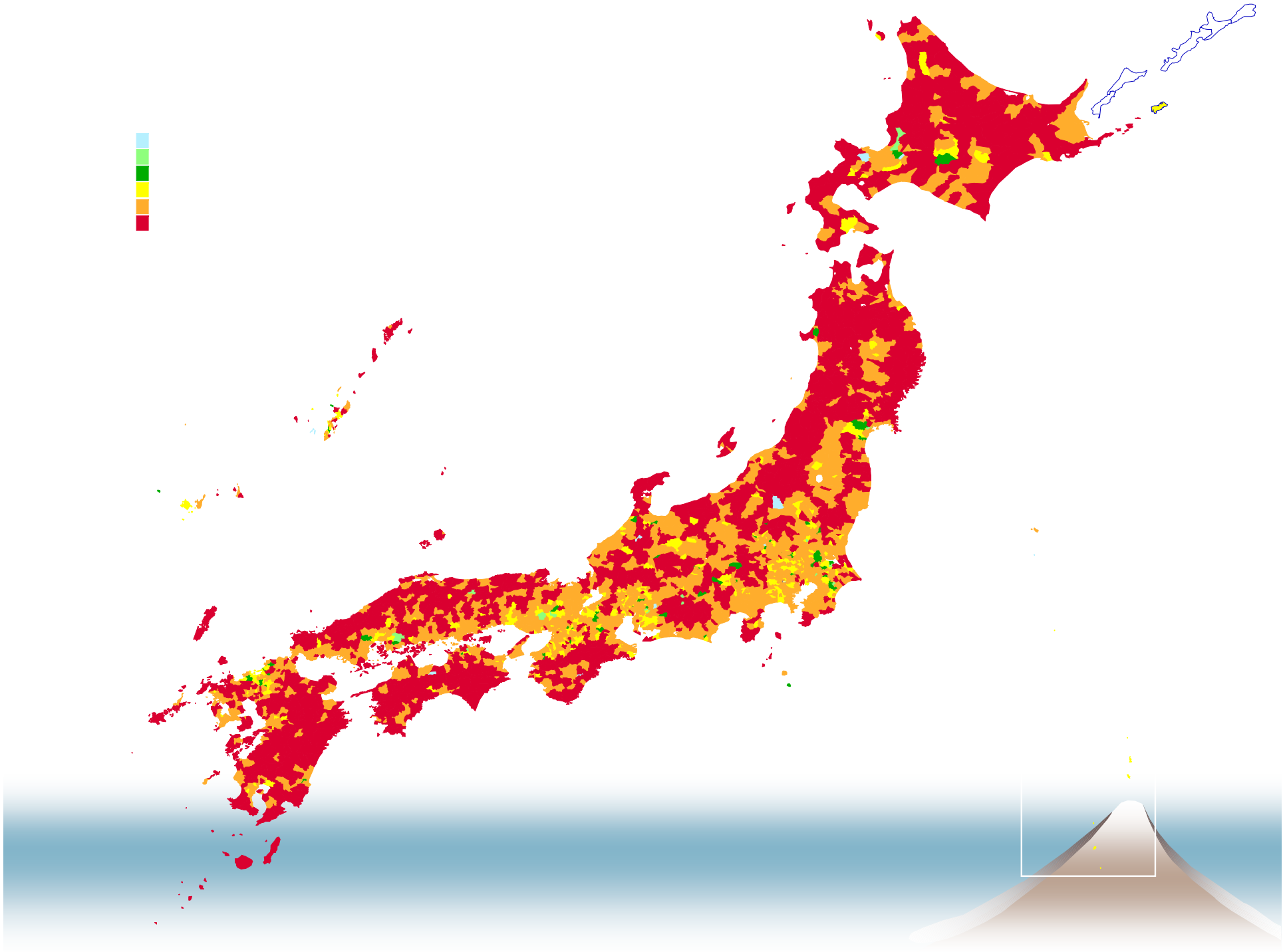




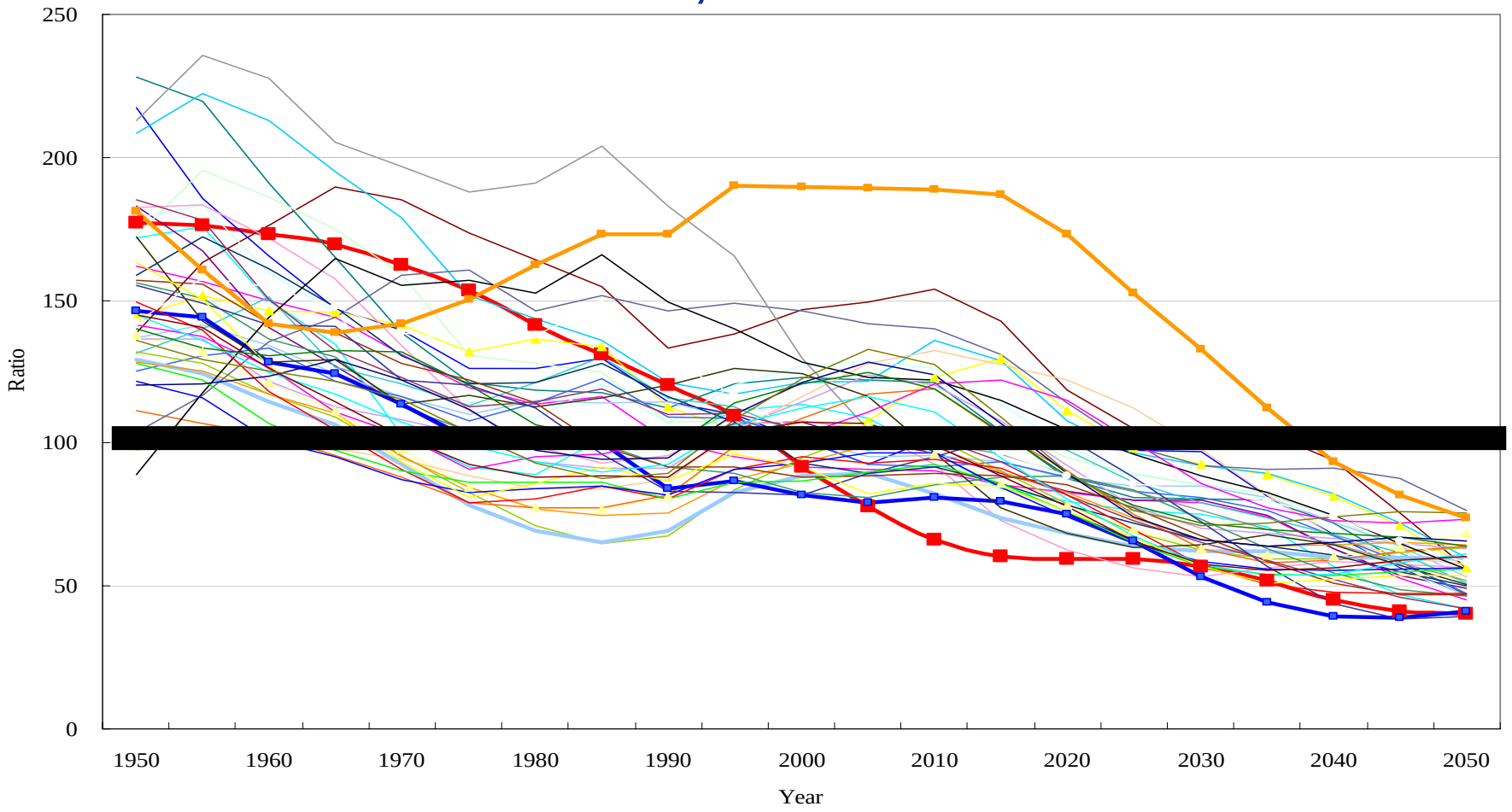




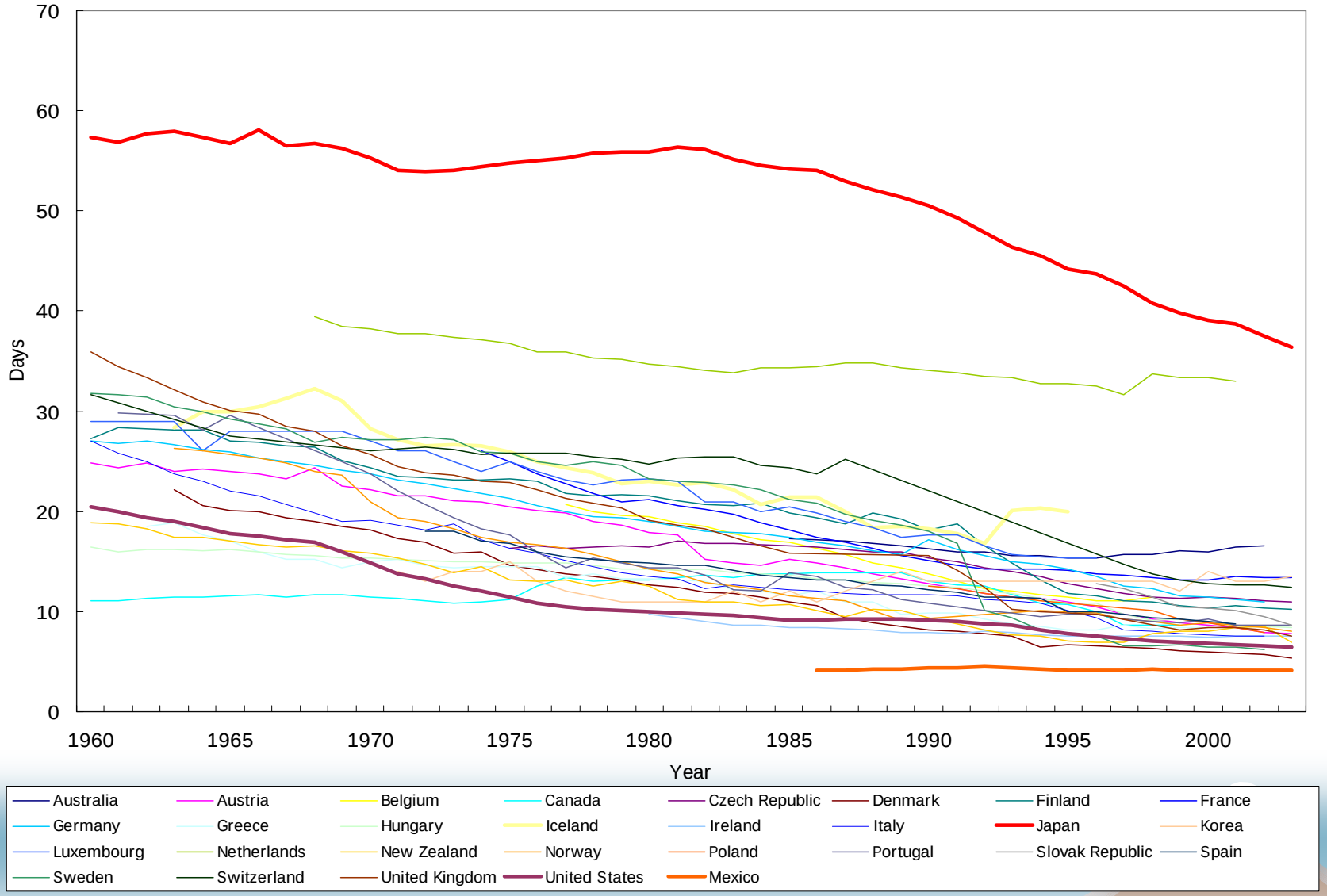




Trends in the family support ratio in selected countries, 1950-2050

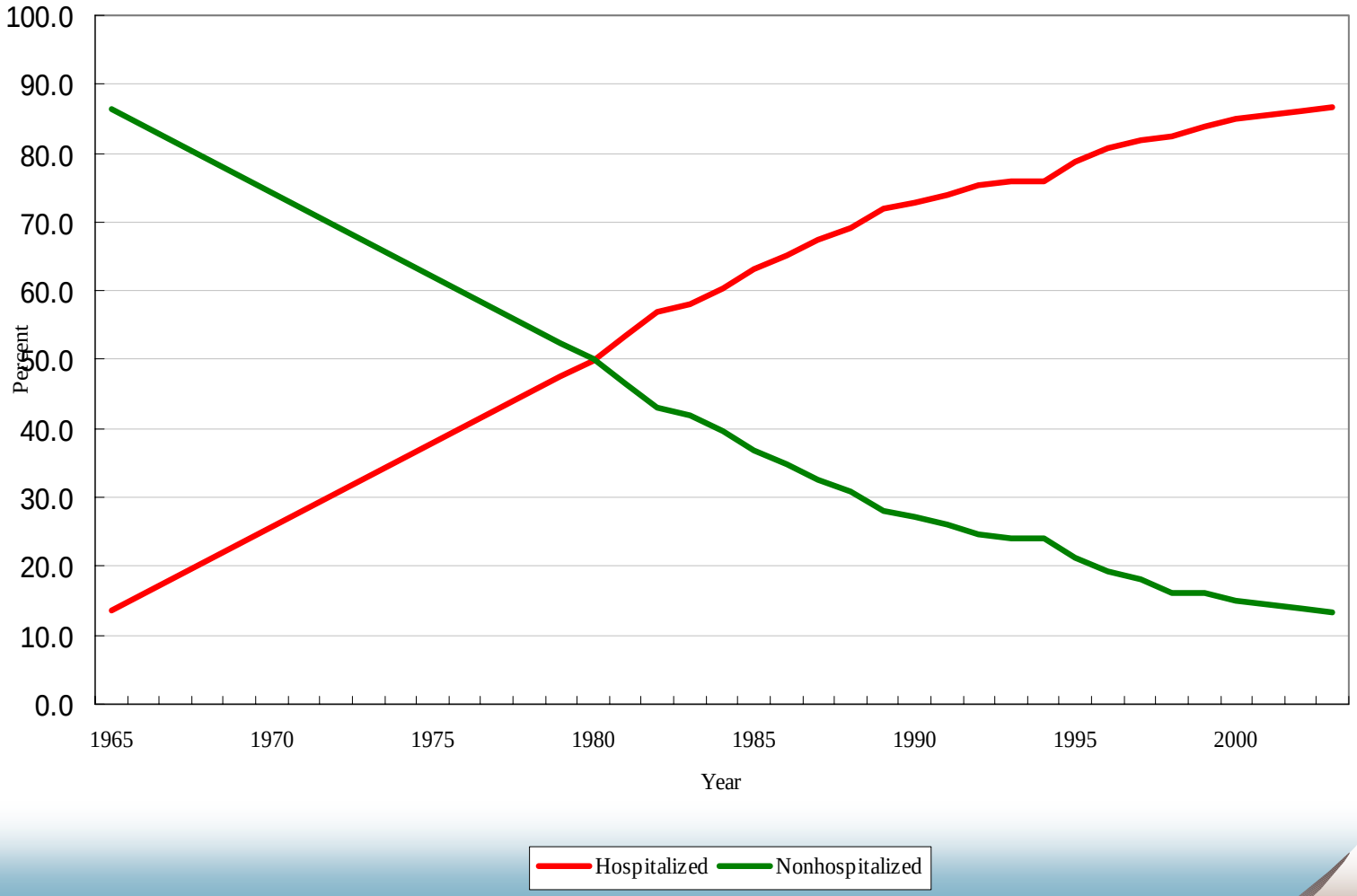


Trends in average days of hospitalization in OECD countries, 1960-2003



Source: OECD, *OECD Health Data 2005*, 2005.

Change in the place of deaths among the elderly in Japan, 1965-2003

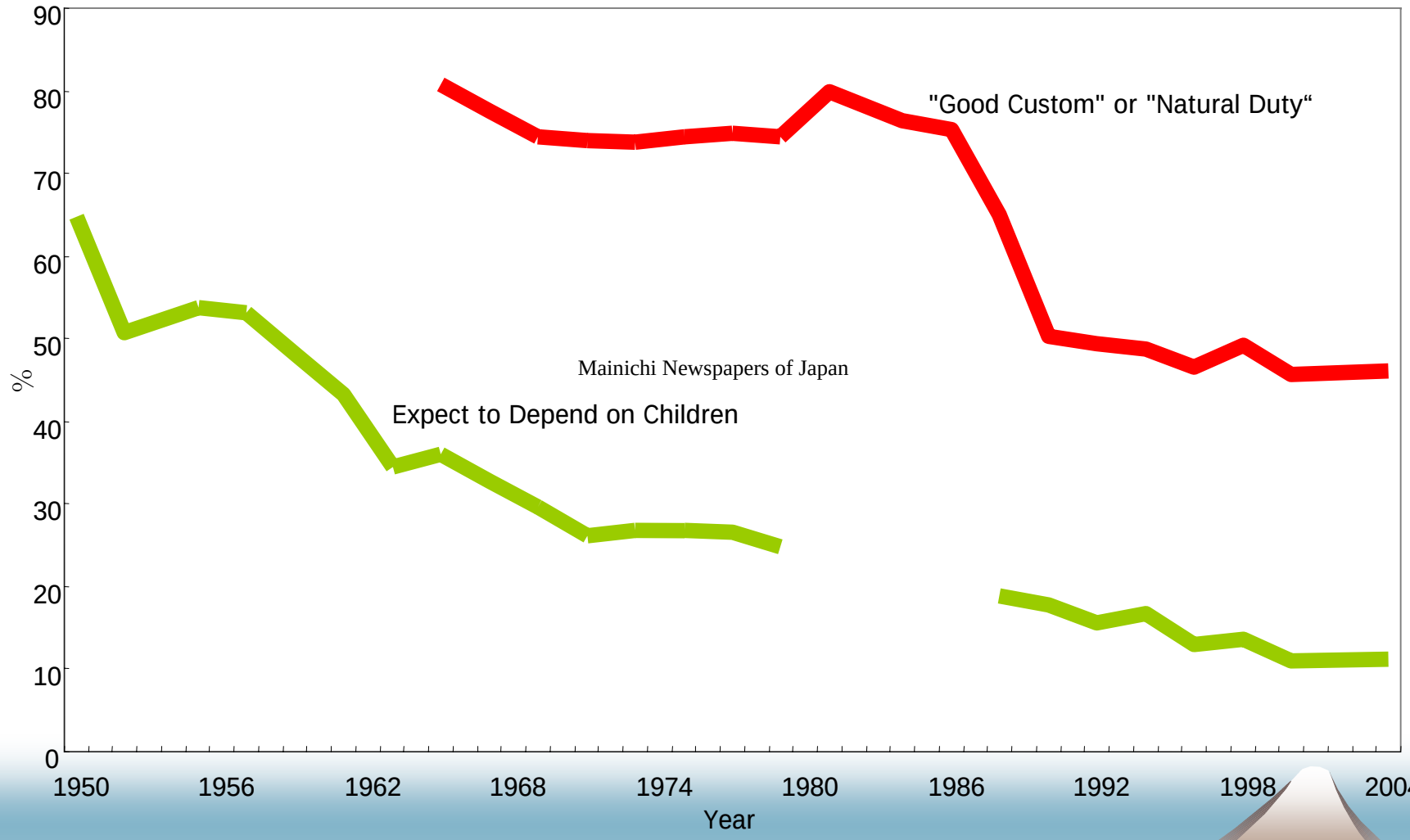


Source: Ministry of Health, Labour and Welfare, *Vital Statistics*, various years.

Sudden

Value Shift

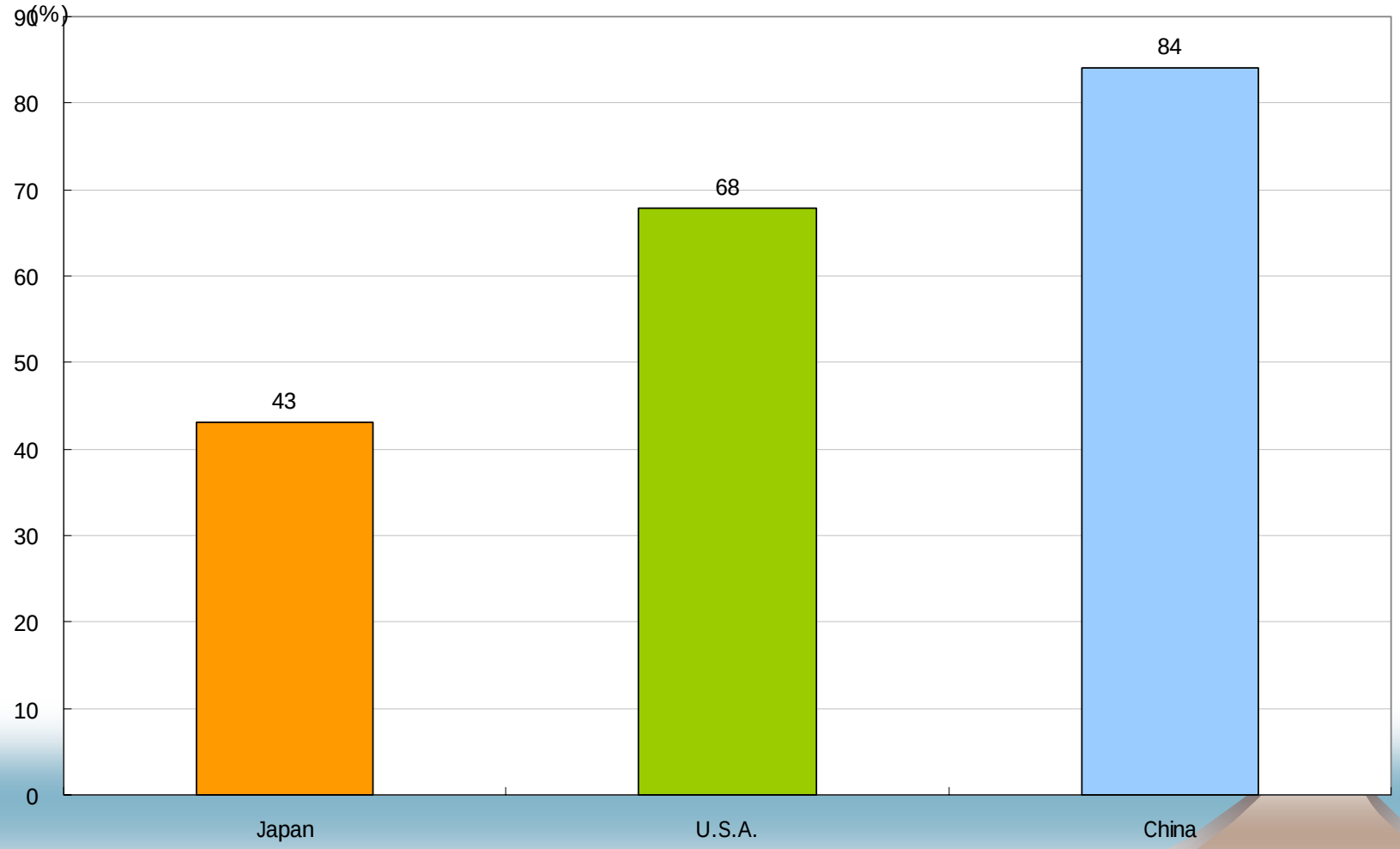
Trends in norms and expectations about care for the elderly: Japan, 1950-2004



Sources: Mainichi Newspapers of Japan, *Summary of Twenty-fifth National Survey on Family Planning,*2000.

Mainichi Newspapers of Japan, *Summary of the 2004 round of the National Survey on Population, Families and Generations*, 2004.

Proportion of high school students willing to take care of parents under any circumstances, when their parents get older and need some help in their daily lives due to poor health, Japan, United States and China, 2005



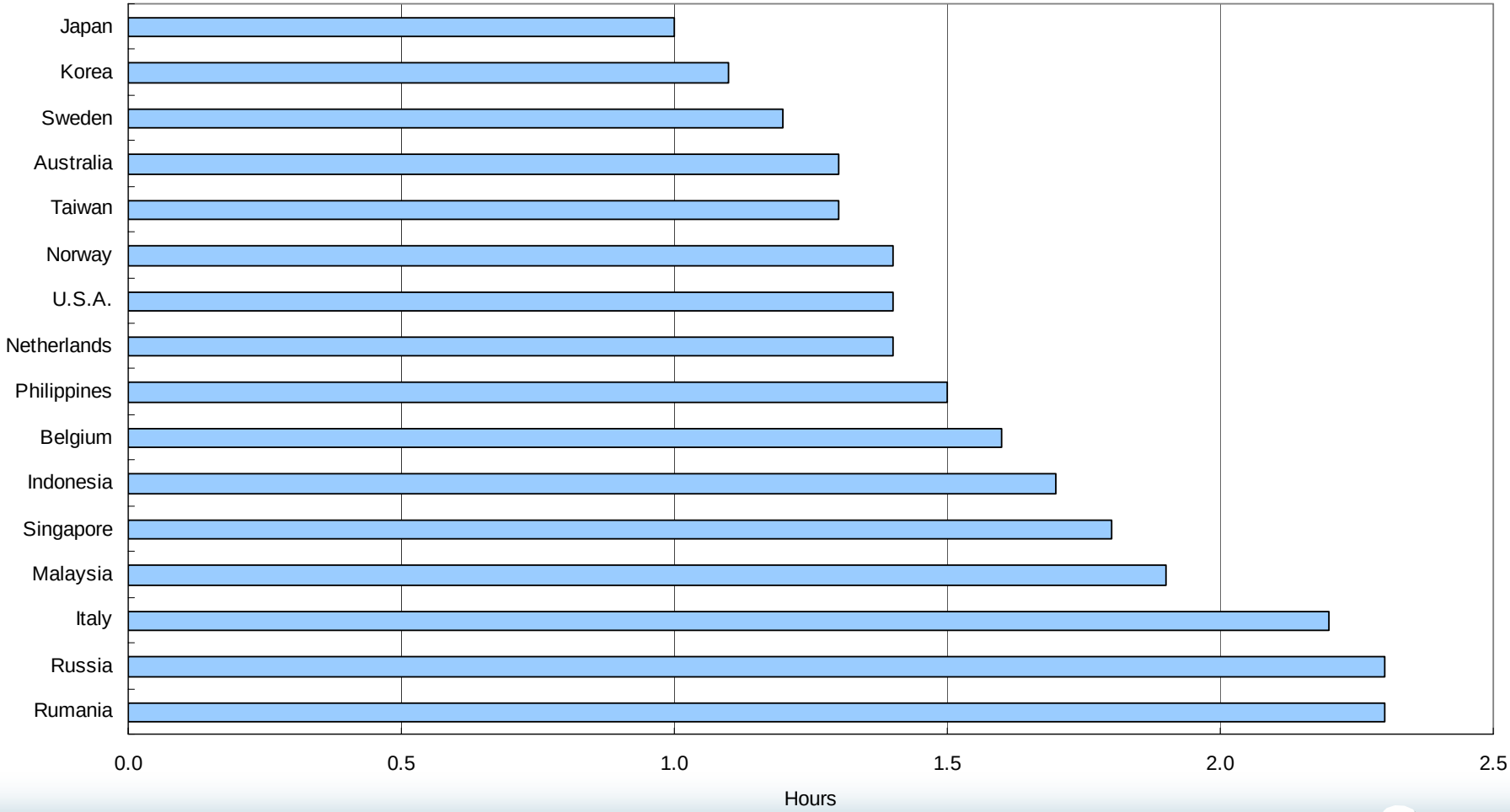
Source: Japan Youth Research Institute, High School Students' Lifestyle Survey, 2005.

Declining Quality of Young Human Capital

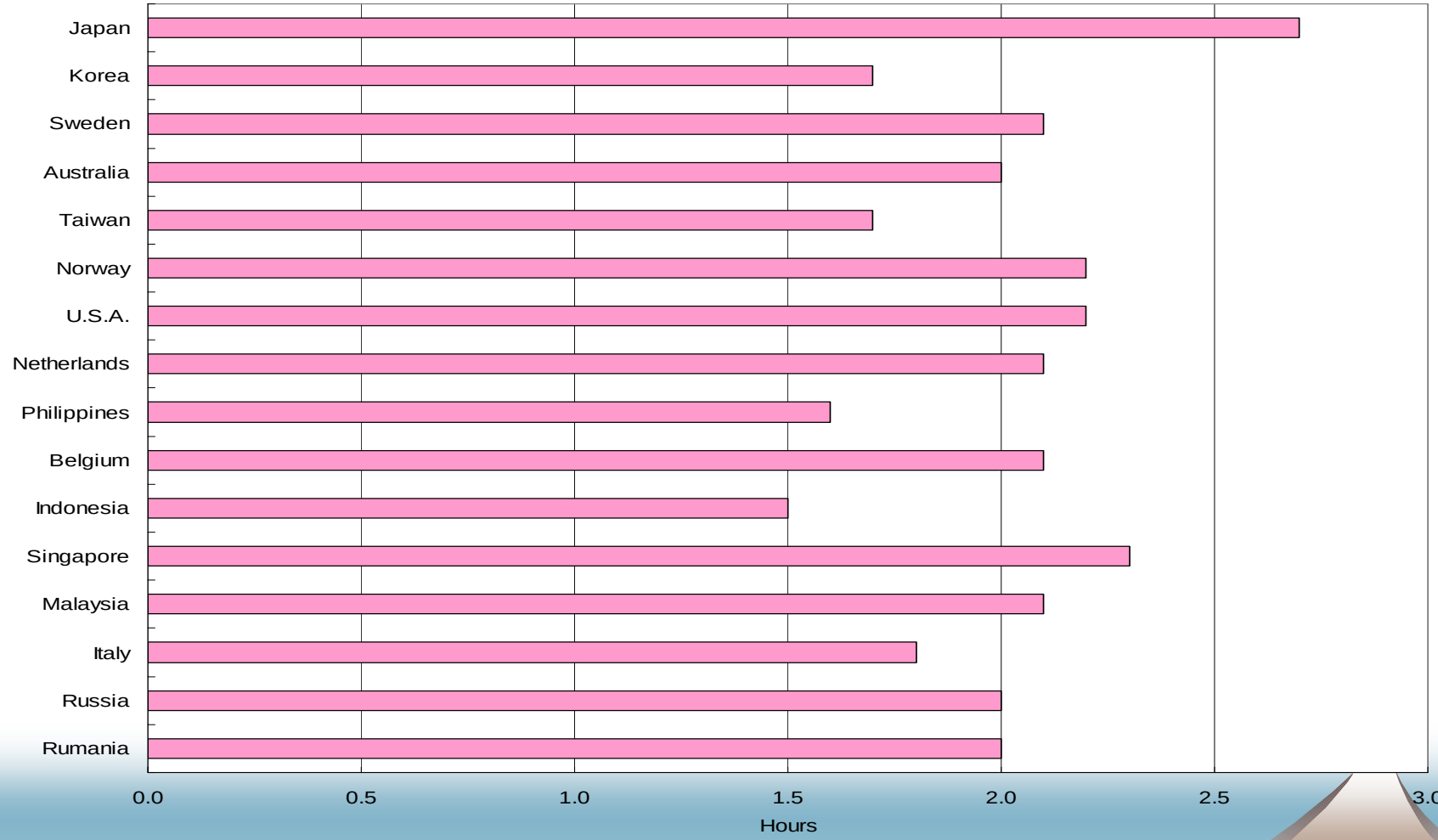
	Mean score in student performance on the mathematics scale				
Rank	Country	2000		Country	2003
1	Japan	557		Hong Kong-China	550
2	Korea	547		Finland	544
3	New Zealand	537		Korea	542
4	Finland	536		Netherlands	538
5	Australia	533		Liechtenstein	536
6	Canada	533		Japan	534
7	Switzerland	529		Canada	532
8	Belgium	520		Belgium	529
9	France	517		Macao-China	527
10	Austria	515		Switzerland	527
11	Denmark	514		Australia	524
12	Iceland	514		New Zealand	523
13	Liechtenstein	514		Czech Republic	516
14	Sweden	510		Iceland	515
15	Ireland	503		Denmark	514
16	Norway	499		France	511
17	Czech Republic	498		Sweden	509
18	United States	493		Austria	506
19	Germany	490		Germany	503
20	Hungary	488		Ireland	503

Source: OECD 2004.

Average hours spent for homework by 8th graders in selected countries



Average hours spent for watching TV by 8th graders in selected countries



How can Japan cope with its rapid population aging?

Policy options available to Japan:

(1) raising fertility and facilitating higher labor force participation of women,

(2) better utilization of aged workers and extension of the retirement age,

(3) labor-saving technology and more efficient use of young workers,

(4) international migration,

(5) direct foreign investment,

(6) social security reform and limits to family support, and

(7) effective utilization of the demographic dividends

Option 1

Retire later

Are they healthy enough?

Data

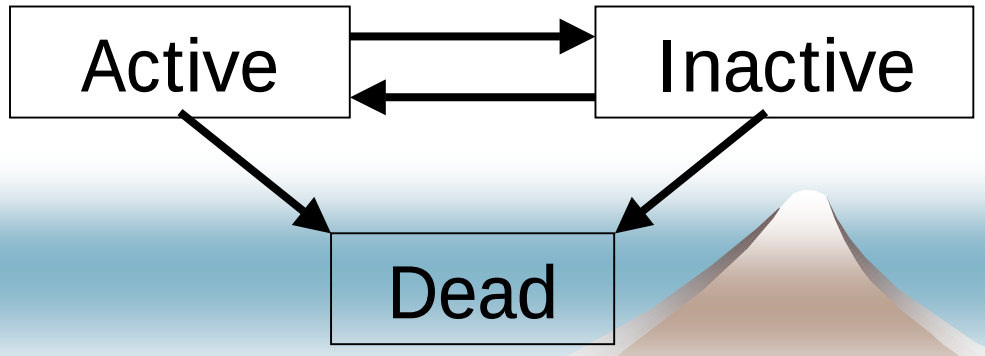
- Nihon University Japanese Longitudinal Study of Aging
  - wave 1 in 1999 and wave 2 in 2001
  - nationally representative sample of non-institutionalized population aged 65 and over in 1999
  - face to face interview survey using structured questionnaire

Definition of Health State

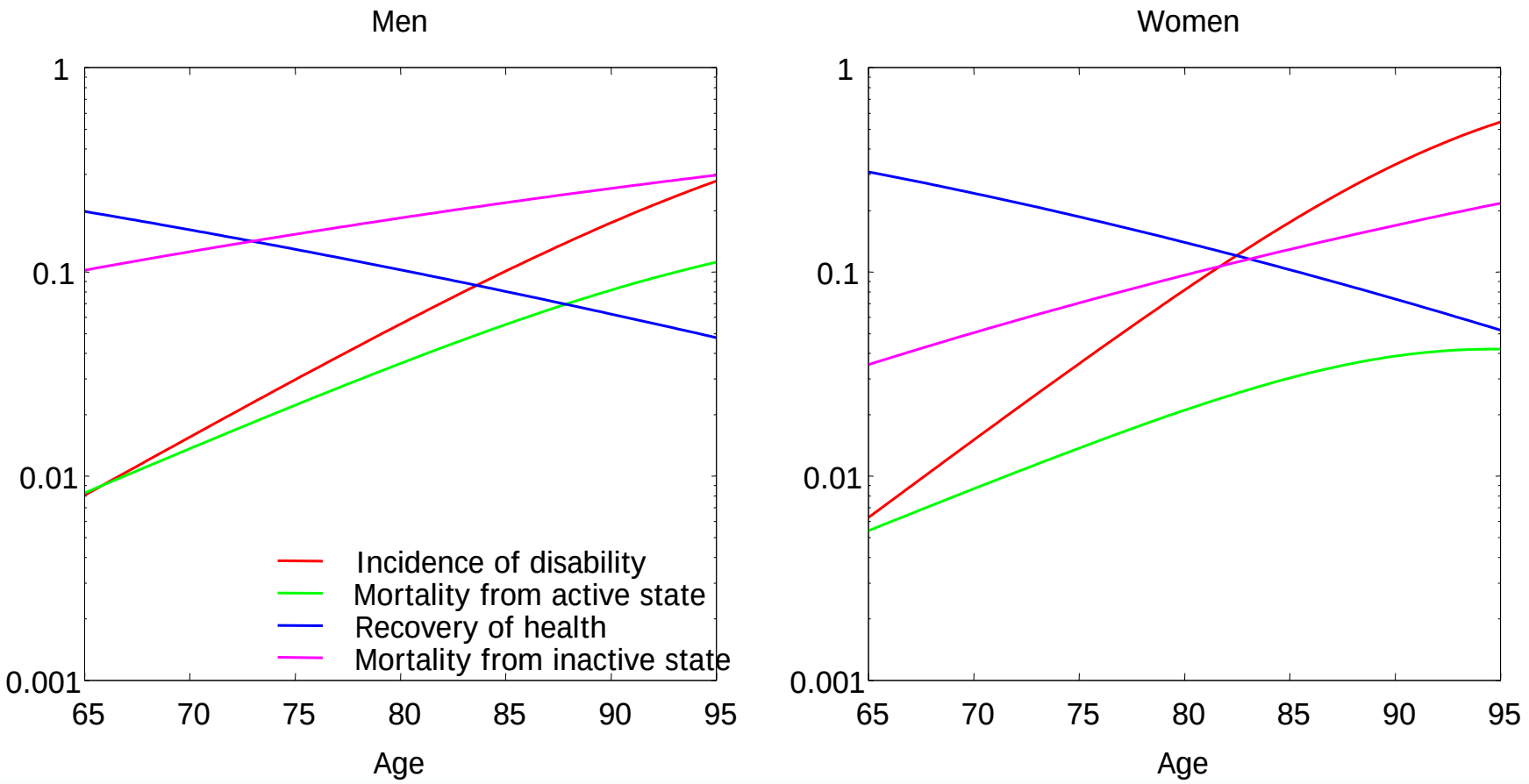
- Healthy/Active
  - no difficulty performing 7 ADLs and 7 IADLs
- Unhealthy/Inactive
  - unable to perform at least 1 ADL/IADL
  - ADL: bathing, dressing, eating, moving from bed to a chair and vice versa, walking in the home, going outside, and toileting
  - IADL: preparing own meals, shopping for personal items, managing money, making a phone call, doing light house work, doing out alone by using public transportation, and taking medication

Estimating Ingredients

- Prevalence rates
  - average of prevalence rates in 1999 and 2001
- Transition probabilities
  - IMaCh



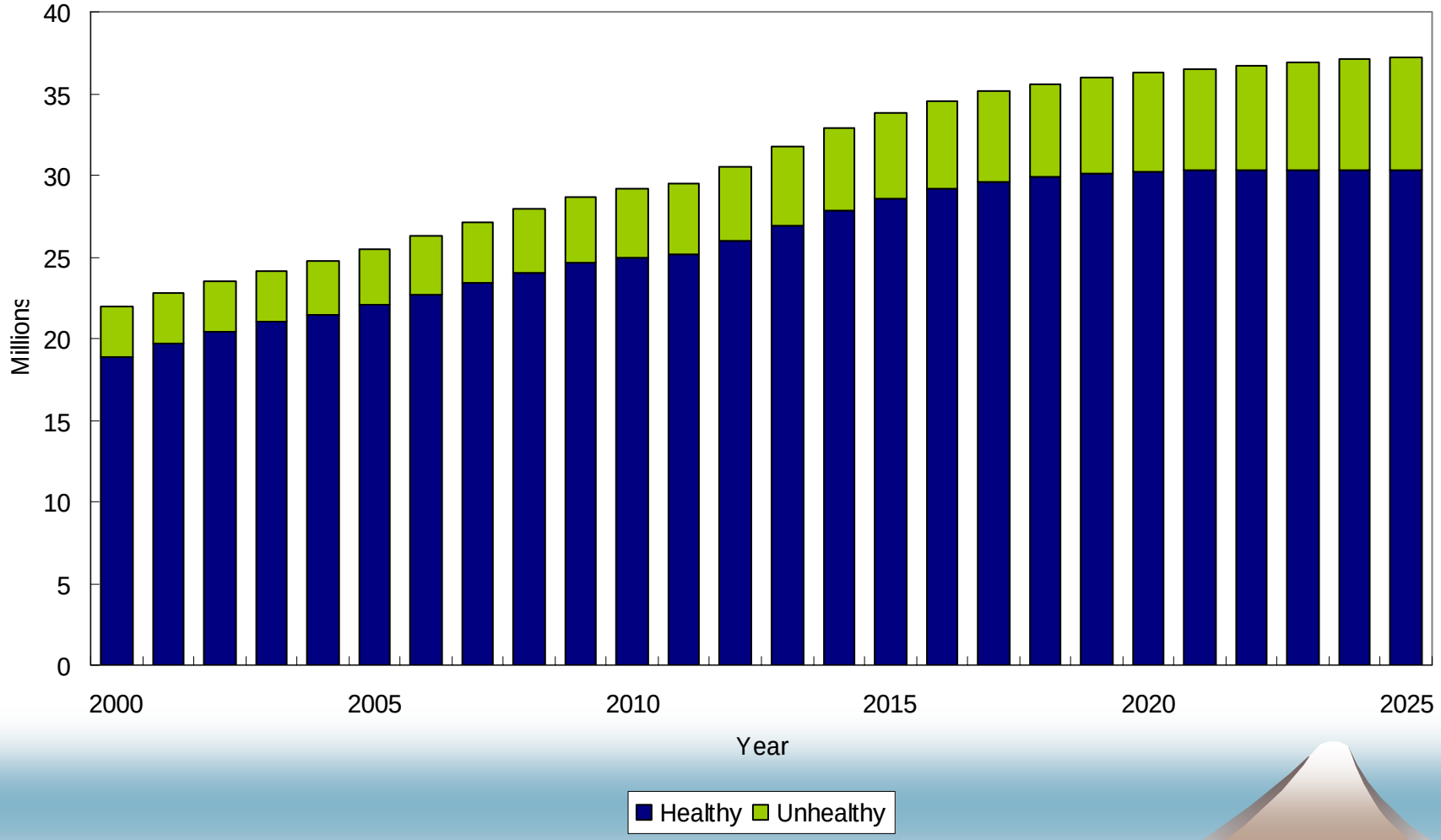
Estimated annual transition probabilities in Japan



Source: Lievre and Saito (2005).

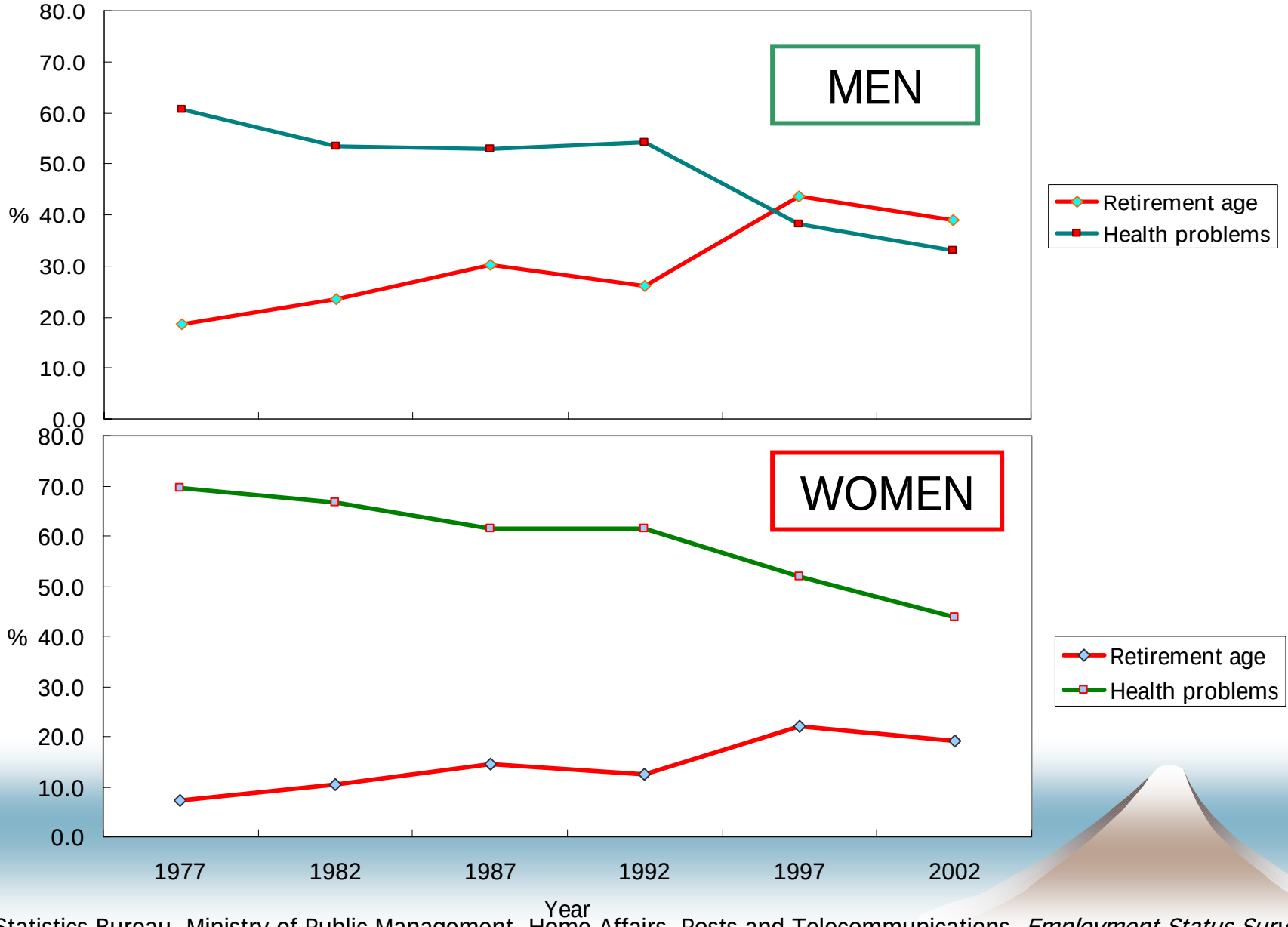
Projected elderly population by heath status, Japan 2000-2025

(based on health status transition rates)



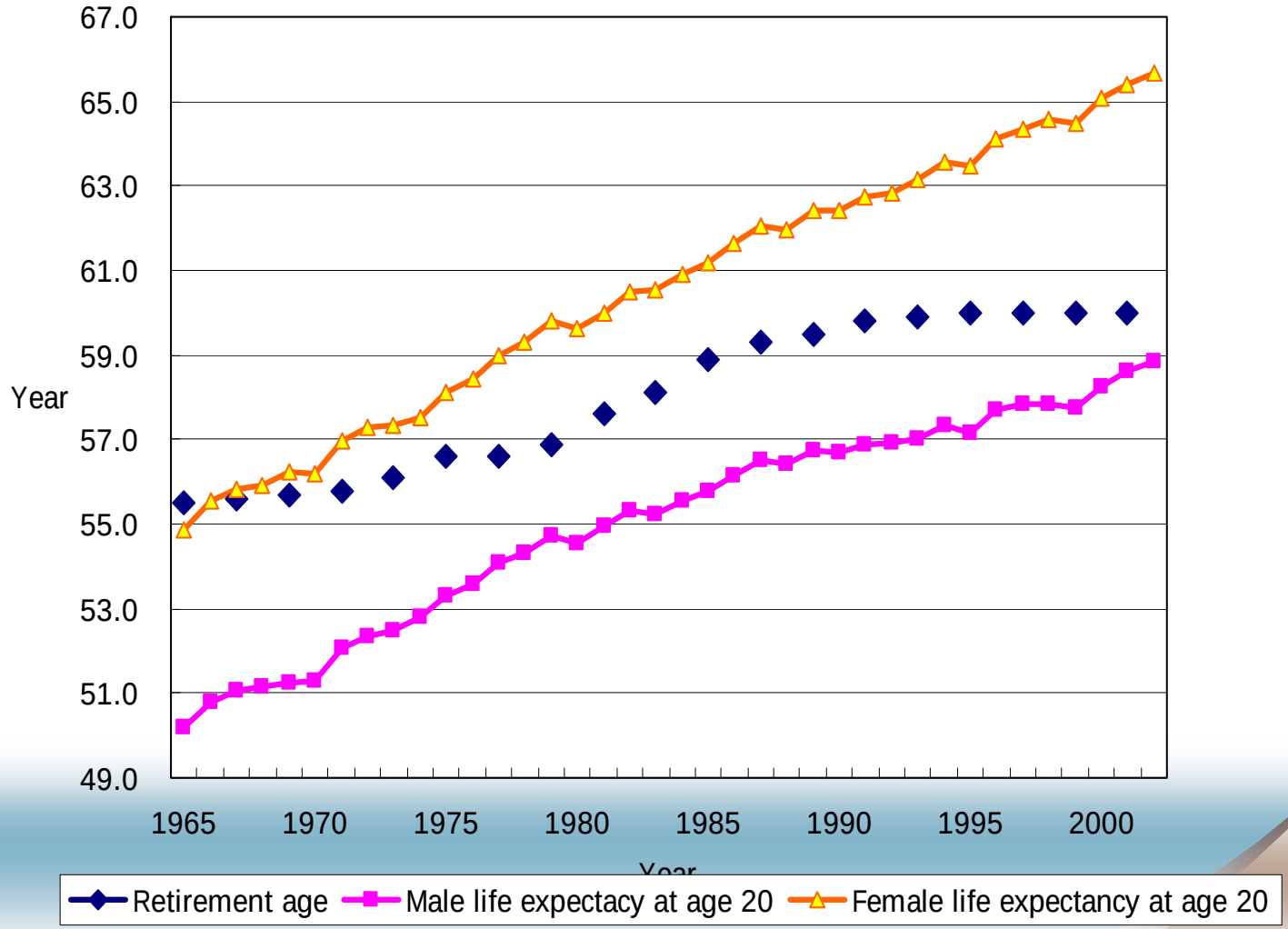
Mandatory retirement age is another serious constraint

Trends in reasons for quitting job for persons aged 65 and over: Japan, 1950-2004

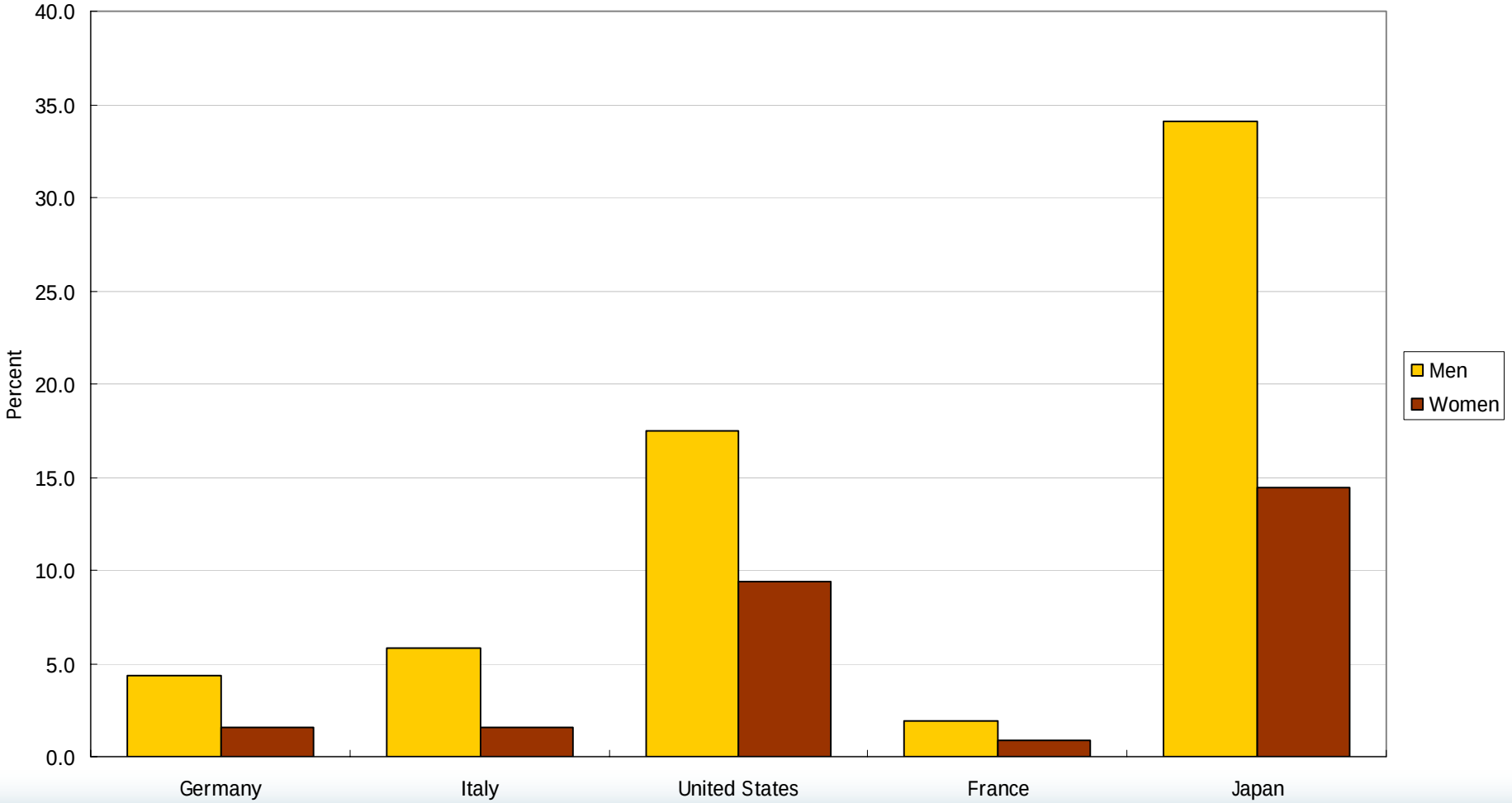


Source: Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Employment Status Survey*,

Change in retirement age at large-scale businesses and life expectancies at age 20 for men and women: Japan, 1965-2002



Labor force participation rates for men and women aged 65 and over in selected countries, 2000



Source: ILO, *Yearbook of Labour Statistics* 2002, 2003.

Two simulations

(1) All healthy persons work

(2) Retirement age from 60 to 65

Simulation exercises for alternative labor force participation among the elderly in Japan, 2005-2025

NUPRI Model projection (Base run)		Simulation 1	Simulation 2
Potential GDP (Trillion yen)			
2005	561.2	653.8 (16.5%)	576.4 (2.7%)
2015	600.6	747.2 (24.4%)	661.8 (10.2%)
2025	619.1	791.3 (27.8%)	692.3 (11.8%)
Potential GDP per capita (Million yen)			
2005	4.4	5.1 (16.5%)	4.5 (2.9%)
2015	4.8	5.9 (23.9%)	5.3 (10.8%)
2025	5.1	6.5 (26.7%)	5.7 (12.3%)
Labor force (1000 persons)			
2005	66958	86803 (29.6%)	70386 (5.1%)
2015	62827	89107 (41.8%)	73938 (17.7%)
2025	59172	87880 (48.5%)	70921 (19.9%)

Simulation 1: We assume that the all healthy persons aged 65 and over will participate with labor force throughout the projection.

Simulation 2: We assume (1) that the labor force participation rates of those aged 60-64 are raised to those of 55 to 59 and (2) that the participation rates of those aged 65 and over are raised by 10 percentage points above the current rates.

Earnings profile changes and demographic dividends will be also changing

Option 2

Effective use of accumulated wealth owned by the elderly

Financial assets

Real assets

Public pension wealth

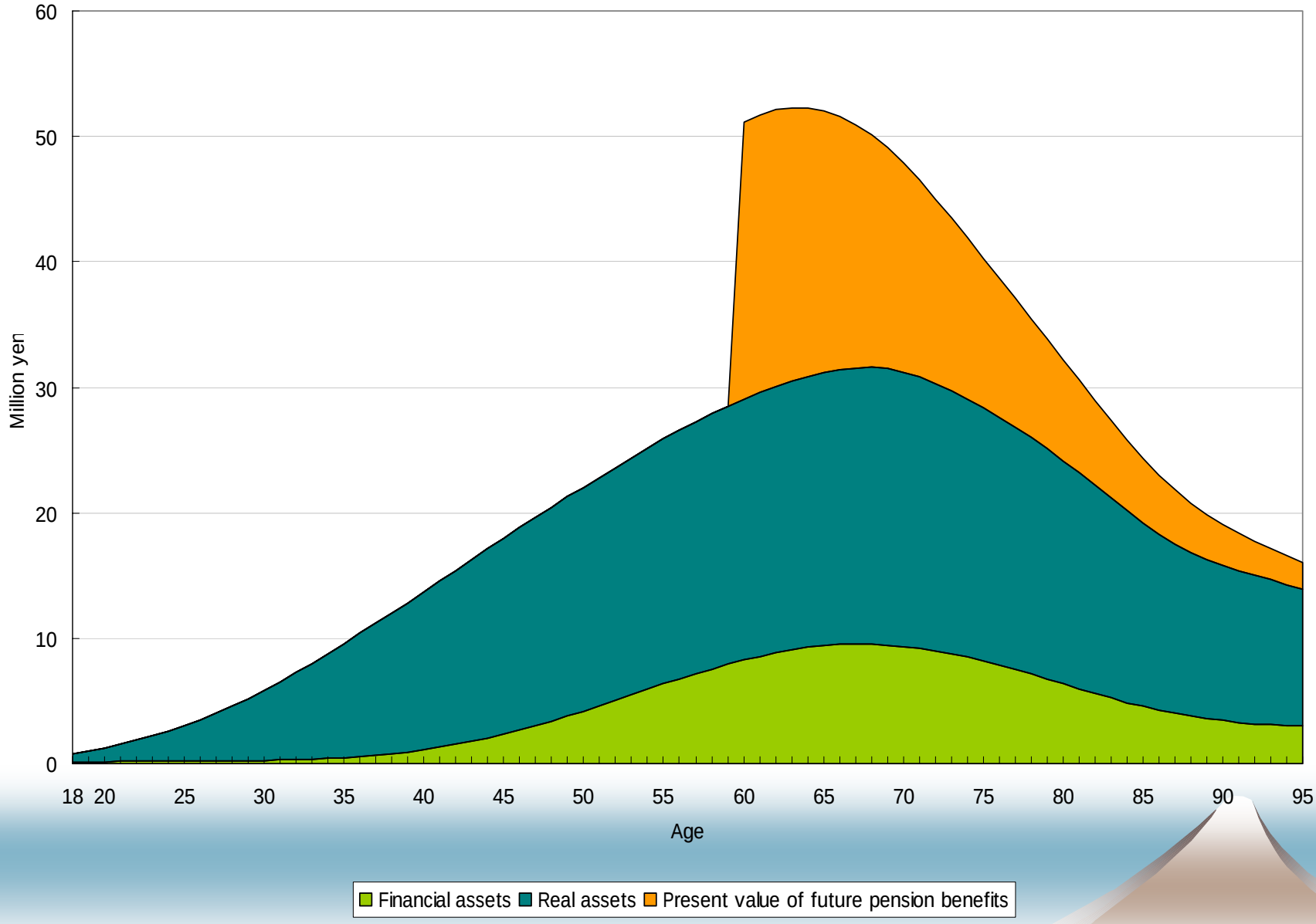
Evaluated in 1999

Public pension wealth

Discount rate 1.25%

(average interest of long-term government bonds)

Age profile of assets and pension wealth in Japan, 1999



Accumulated wealth for those aged 60-90

1637 trillion yen

US $16.37 trillion

Accumulated wealth can be invested abroad

Caution

OECD's warning!

71 % of Japanese adults have no knowledge about investment in equities and bonds

Caution

OECD's warning!

57 % of Japanese adults have no knowledge of financial products in general

Financial education is urgently needed

Future Japanese elderly persons

will be wealthy!

Future Japanese elderly persons

will be

not only wealthy but healthy!

Future Japanese elderly persons

will be

wealthier, healthier

and

cleverer!

Future Japanese elderly persons

may save

Japan!

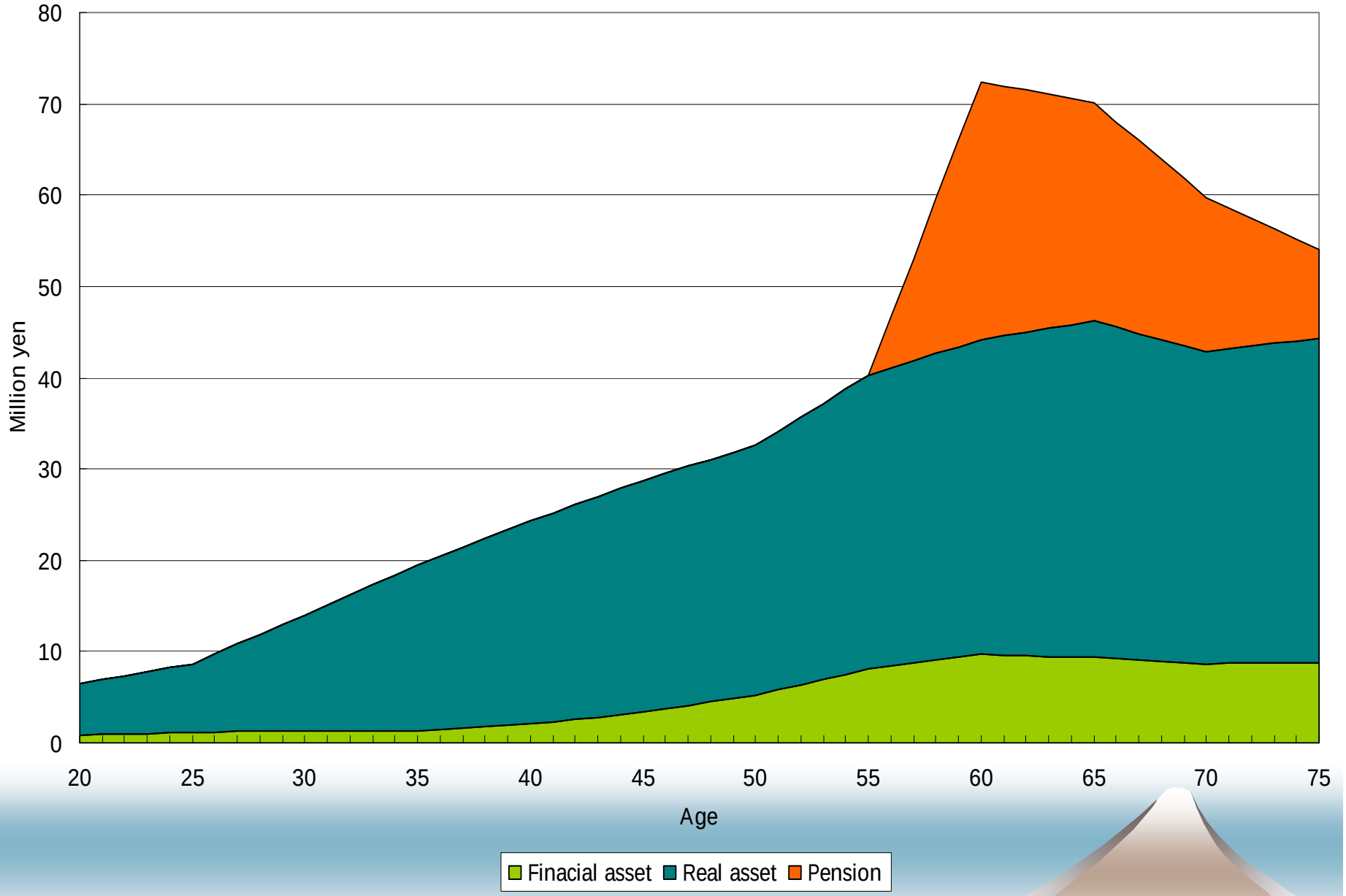
- Even fertility may recover!!!

Similar studies

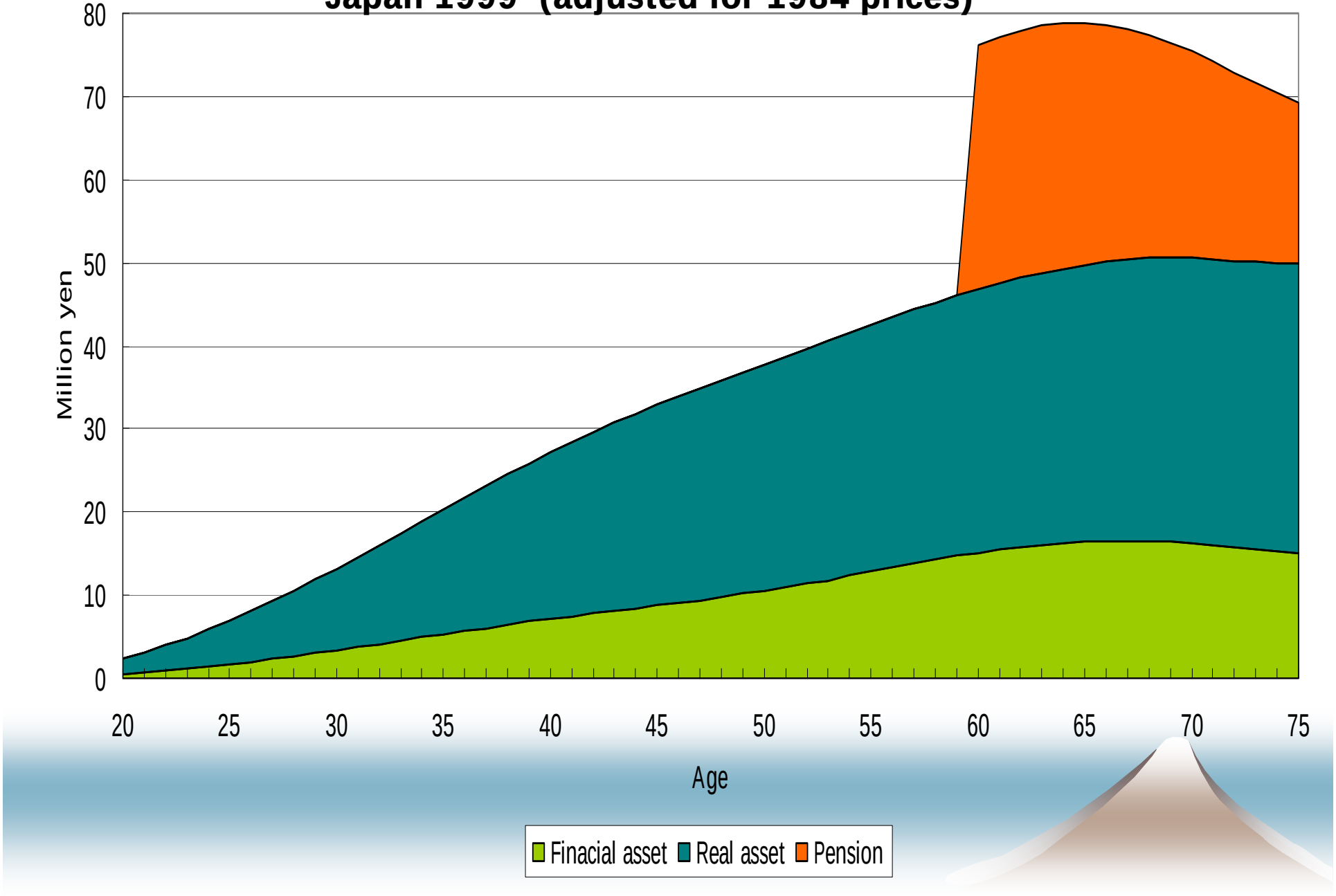
in Japan

1990 study done by Takayama and his associates

Takayama's Study, Age profile of assets and pension wealth, Japan 1984

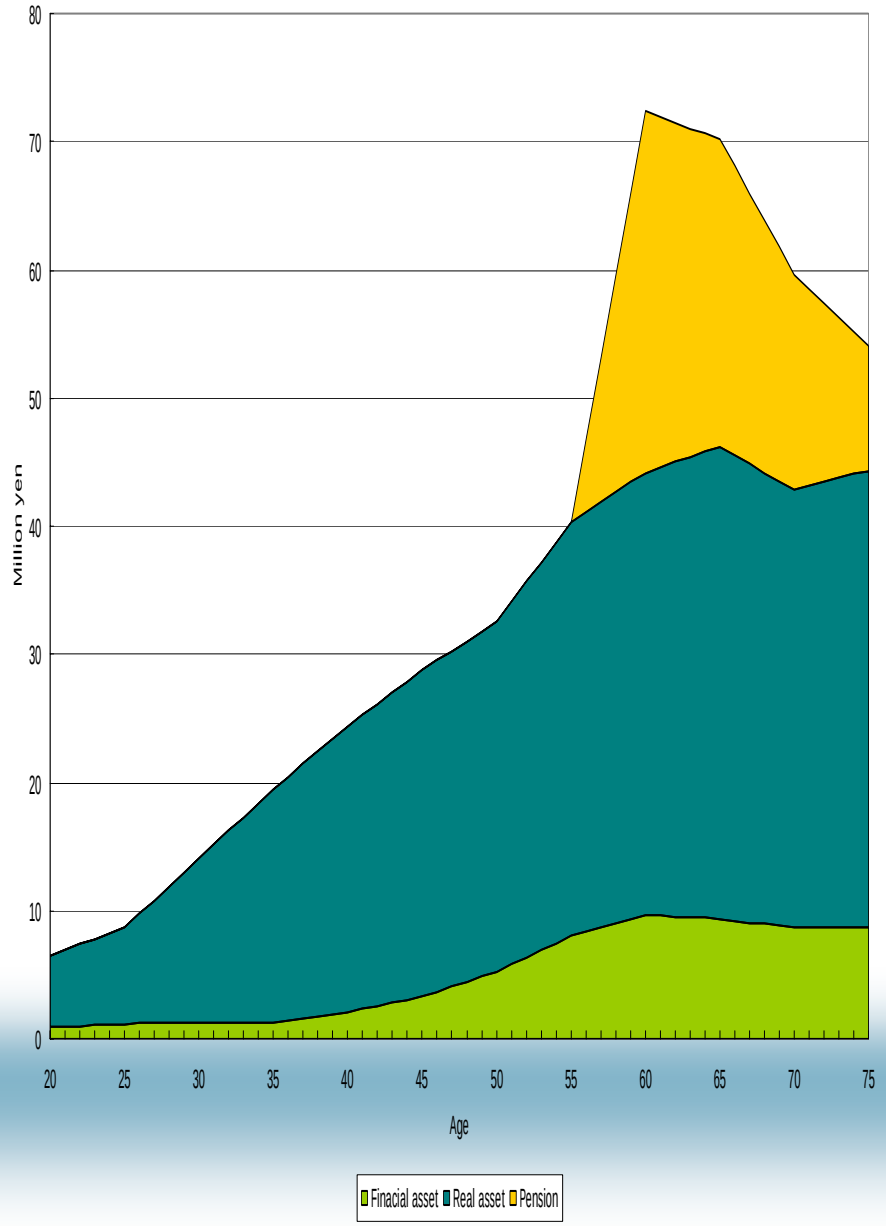


Age profile of assets and pension wealth, based on Takayama's approach, Japan 1999 (adjusted for 1984 prices)

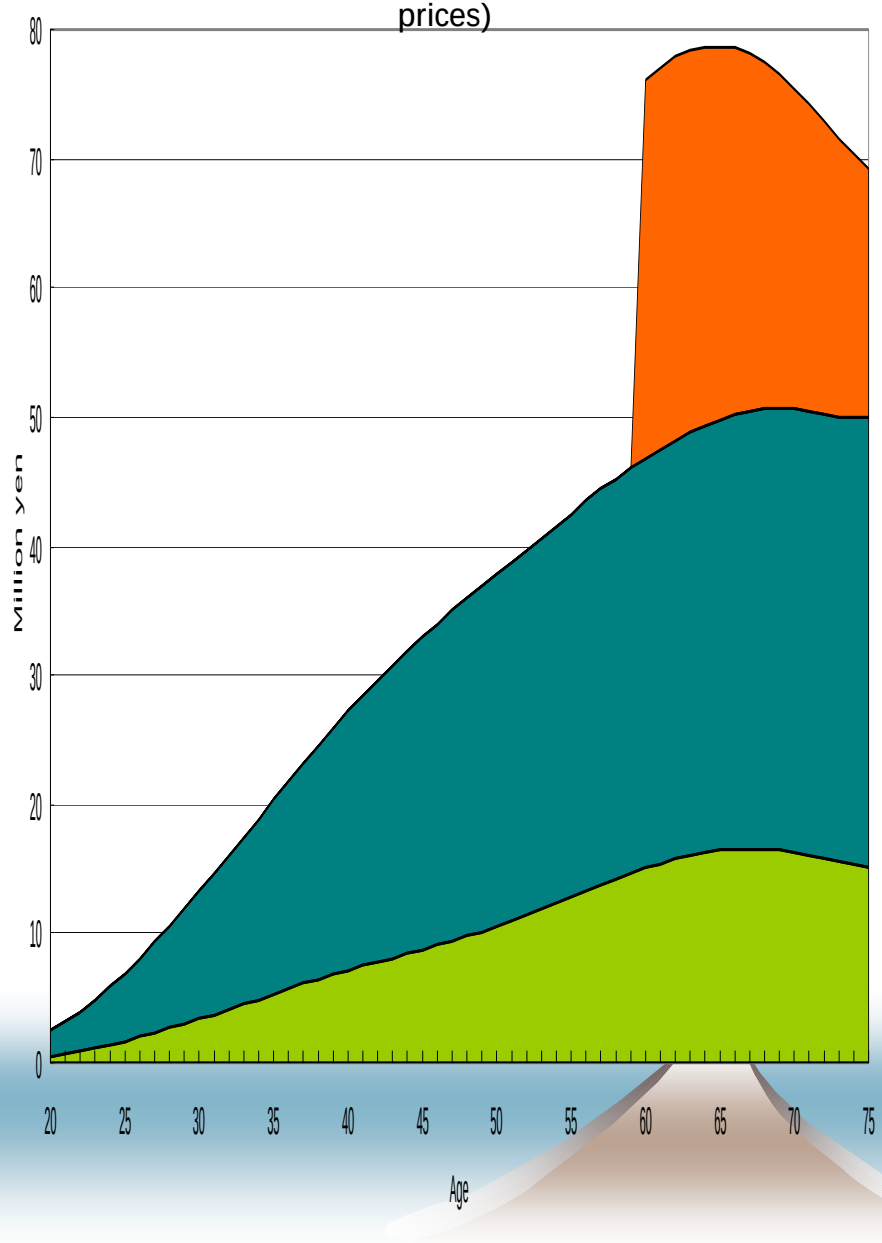


Age profile of assets and pension wealth, Japan 1984 and 1999

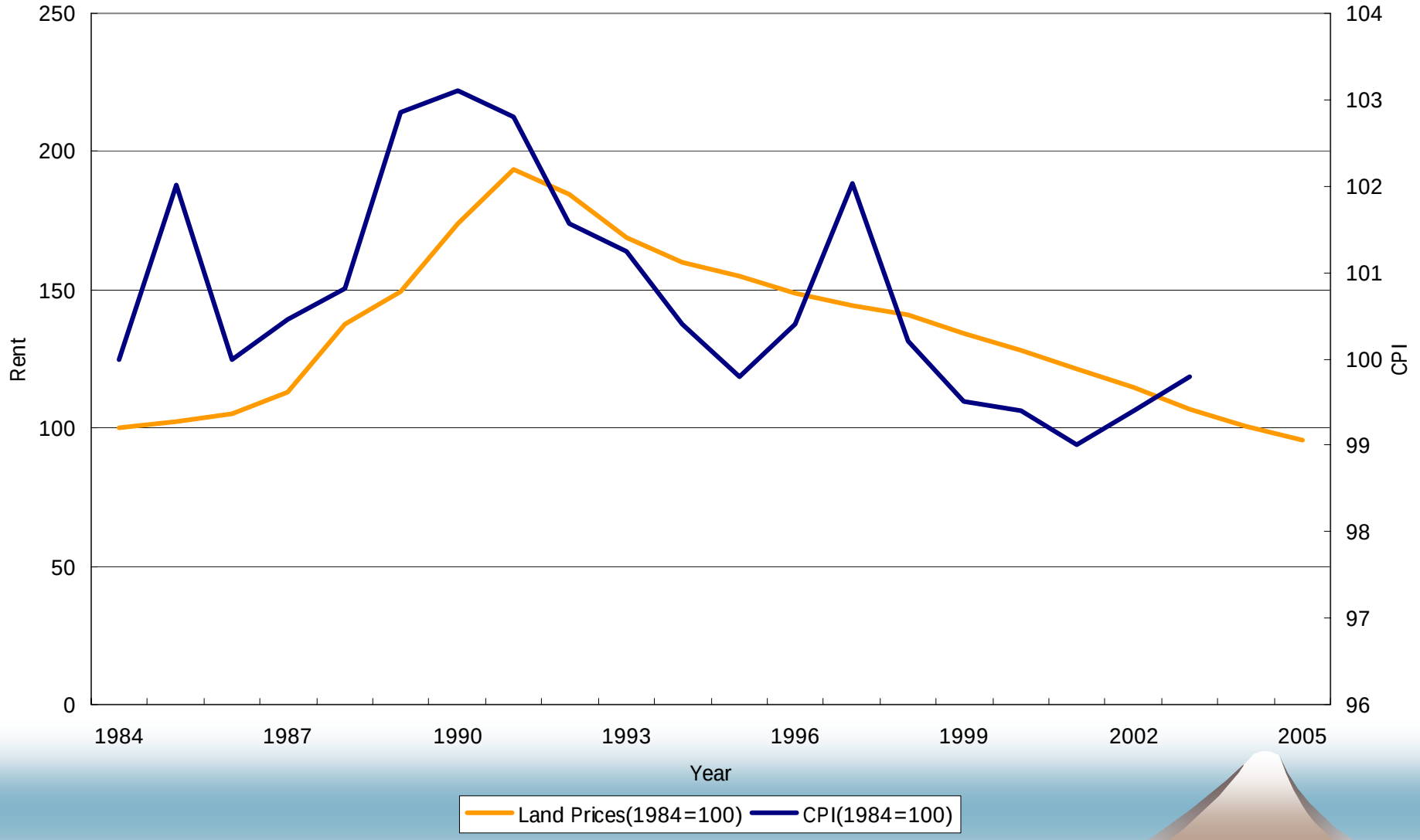
1984



1999 (adjusted for1984 prices)



Change in Land Prices and CPI in Japan



First Familial Transfer in the History of Mankind

Australopithecus aphaeresis