Current Situation and Actuarial Issues of Long-Term Care Insurance in Japan

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Before the main topics…
Restrictions on the sale of insurance products in Japan

- Life Insurance products
  (called “first sector insurance” in Japan)
  →Only life insurance companies are permitted to sell

- Automobile insurance, fire insurance, etc.
  (called “second sector insurance” in Japan)
  → Only non-life insurance companies are permitted to sell

- Medical insurance, long-term care insurance, etc.
  They are called “third sector insurance” in Japan)
  →Both life insurance companies and non-life insurance companies are permitted to sell

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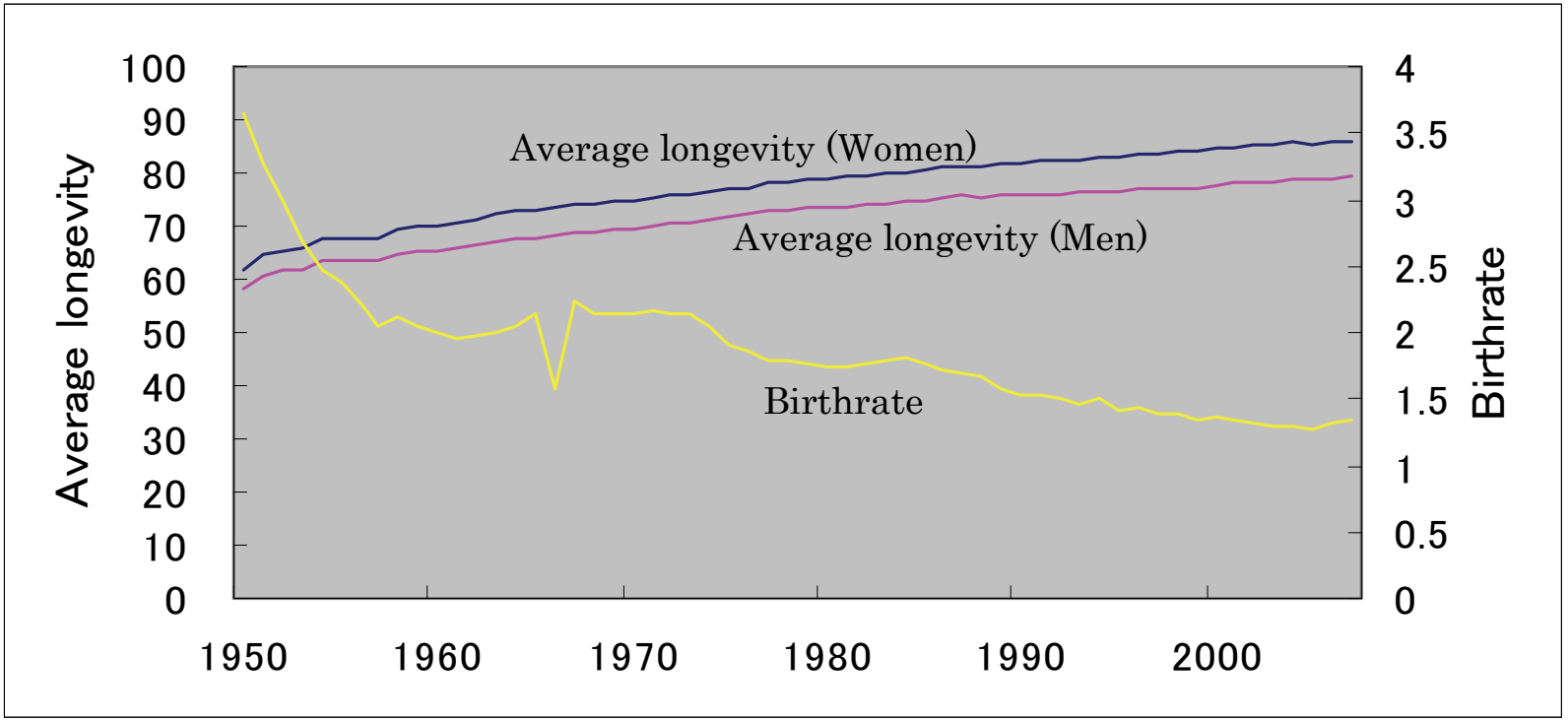
1.Introduction - Average longevity and birthrate in Japan

Fig. 1. Average longevity and birthrate in Japan



Source: Ministry of Health, Labour and Welfare: Population Survey Report, Life Table

- The average longevity of Japanese people as of 2007 is …

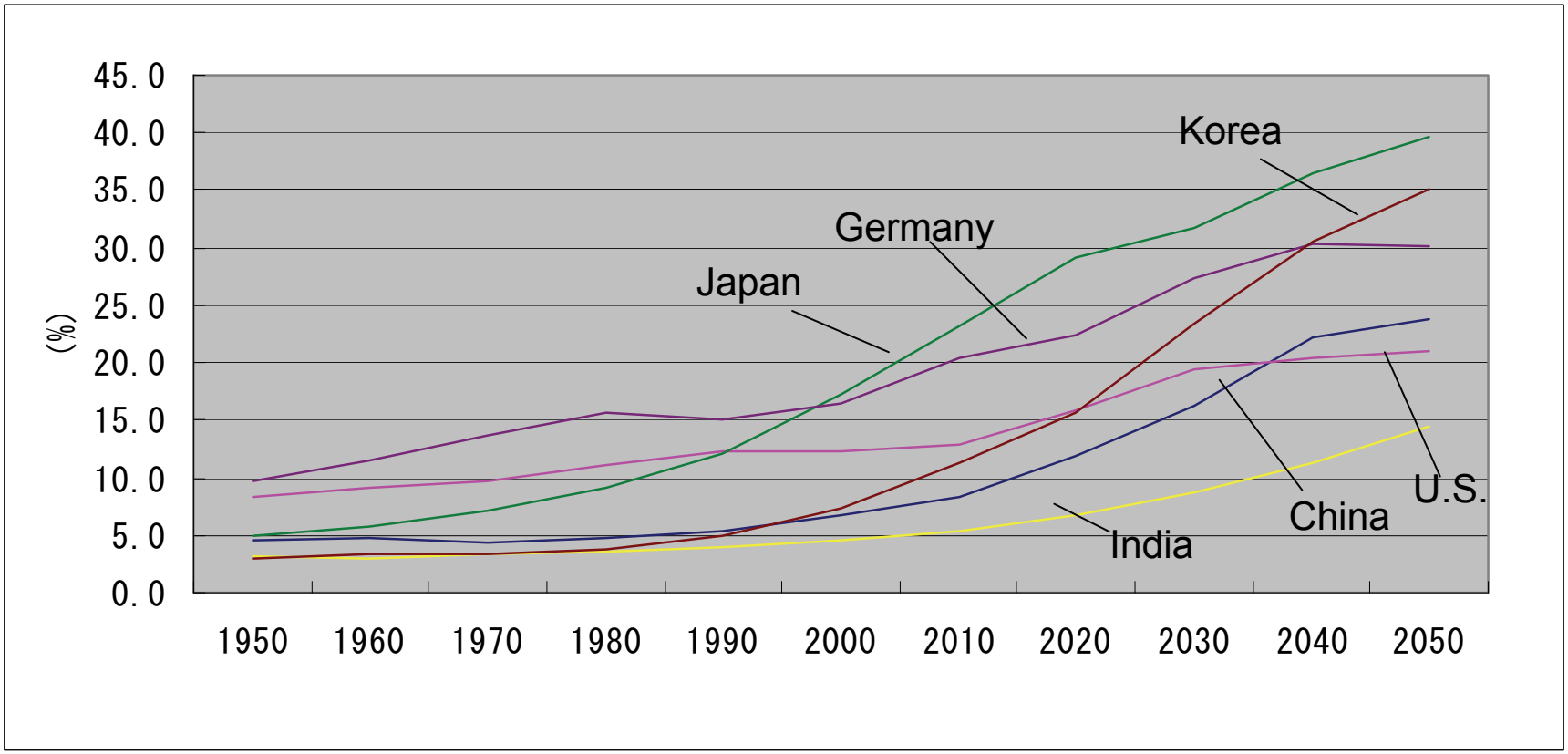
  79 years for men, 86 years for women and 83 years for both sexes

- The birthrate in Japan as of 2007 is …

  1.34

1.Introduction - the proportion of elderly people

Fig. 2. Cross-country comparison of the proportion of population aged 65 years or over to total population

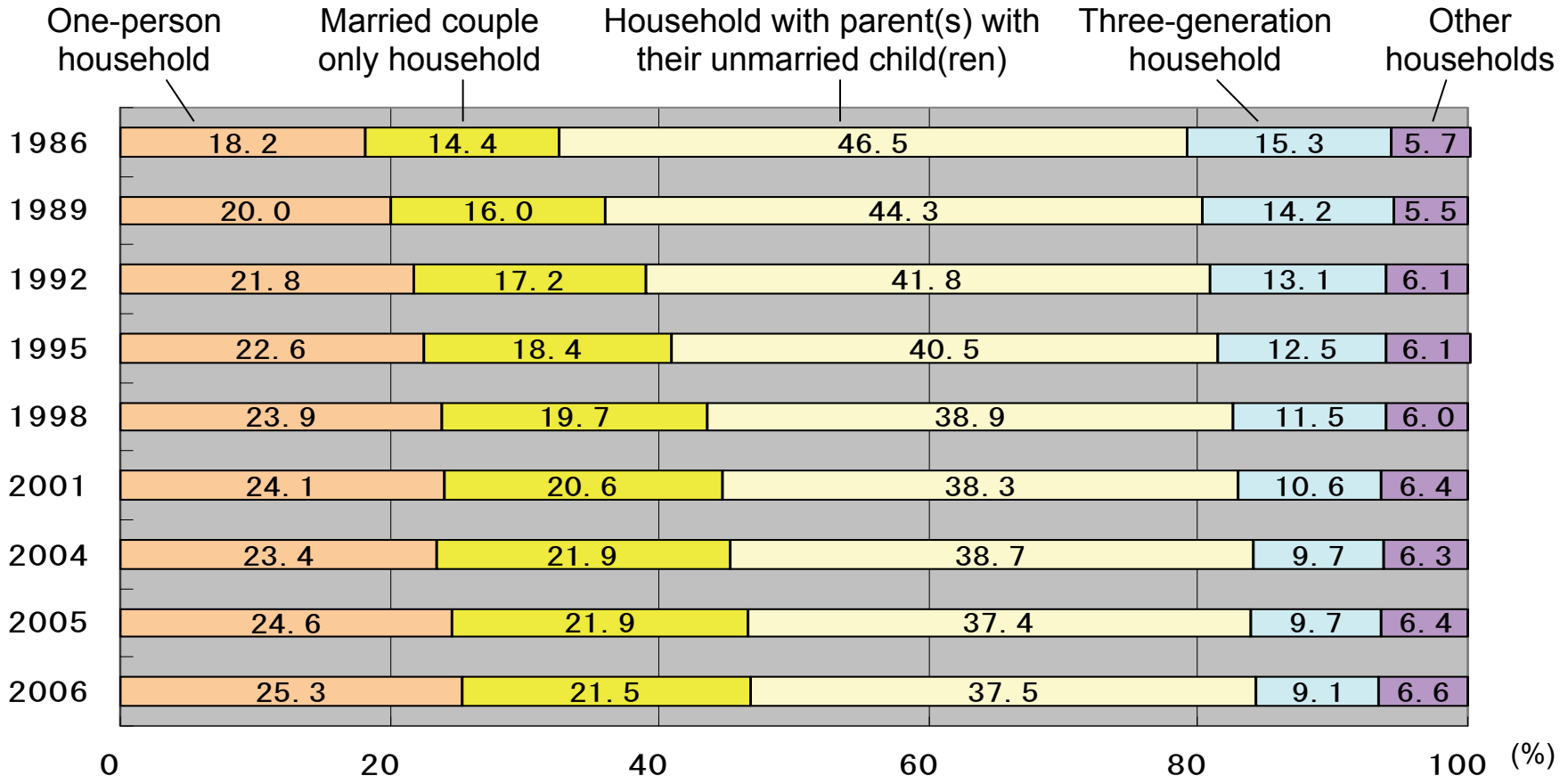


Source: World Population Prospects; 2006 Revision

- The percentage of persons aged 65 and over in the total population of Japan currently is… about one in five, and it is expected to rise to one in four by 2015 and one in three by 2040.

1.Introduction - Proportion of households by type of household

Fig. 3. Proportion of households by type of household in Japan



Source: Ministry of Health, Labour and Welfare: A Survey of National Living Standards

・Family members are much more likely to live separately.
→In Japan, this phenomenon is referred to as a “trend toward nuclear families.”

1.Introduction

- The percentage of elderly people is increasing.

- Other family members tend to not be living nearby when an elderly enters a state requiring long-term nursing care.

→Caring for the aged become an extremely serious social issue.

→This was the motivation for the introduction of Japan's public long-term care insurance system in 2000.

2. Outline of the public long-term care insurance system in Japan

(1) Eligible persons

	Category 1 insured persons	Category 2 insured persons
Age category	65 years or over	40 - 64 years
Benefit payment Conditions	When care becomes necessary	When care becomes necessary due to any of 16 types of mainly age-related diseases such as dementia presenilis or cerebral vascular disease
Method of Premium Collection	Premiums shall be deducted from pension benefits.	Collected with premiums for health care insurance program they join and paid in lump sums.

2. Outline of the public long-term care insurance system in Japan

(2) Steps for receiving care services

When care becomes necessary

Apply at the city, town or village office

Care need certification

1) Home-visit interview (municipal personnel visits insured person at home and conducts an investigation), obtaining of doctor's opinion
2) Primary determination (computer processing of home-visit interview results)
3) Secondary determination (certification of long-term care need based on the primary determination and regular doctor's opinion)

Not applicable

Applicable

Level of support need 1	Level of support need 2	Level of care need 1	Level of care need 2	Level of care need 3	Level of care need 4	Level of care need 5

Mild → Severe

2. Outline of the public long-term care insurance system in Japan

(3) Type of services available

Home care services	● Home help service Home helpers visit at home and provide care. ● Day service A user goes to a day service care facility and receives care. ● Rental of assistive devices
Facility services	A user moves into accommodation at a facility such as a special nursing home for the elderly, and receives care.

2. Outline of the public long-term care insurance system in Japan

(4) Self-pay burden when receiving services

[1]Co-payment

There is a limit on benefits paid for home care services and the **co-payment is 10%**.

[2]Services in excess of pubic insurance

When you receive services outside of or in excess of those included in public long-term care insurance, **you have to bear the full expense of the extra services**.

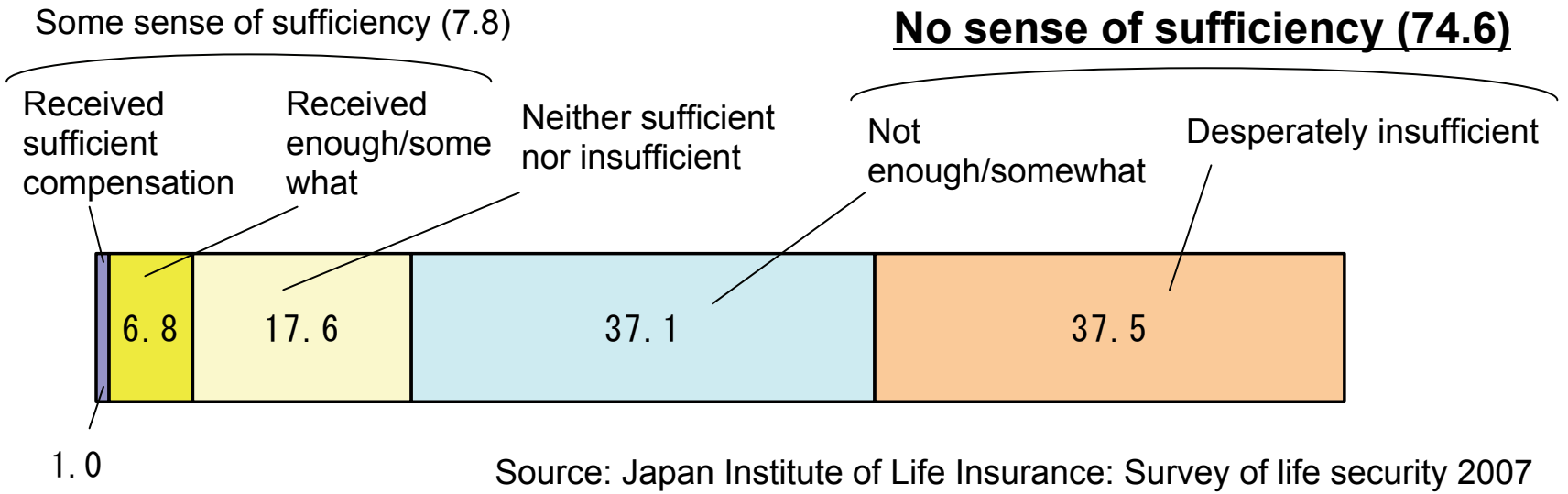
[3]Not-included services

There are also services **which are not included in public long-term care insurance cover**.

3. Marketability of private long-term care insurance and contents of product

(1) Marketability

Fig. 4. Sense of sufficiency for long-term care compensation (Unit: %)



Source: Japan Institute of Life Insurance: Survey of life security 2007

In a similar survey on medical security…

30.2% of respondents indicated “Some sense of sufficiency”

59.7% indicated “No sense of sufficiency.”

3. Marketability of private long-term care insurance and contents of product

(2) Contents of products

[1] Reason for payment

- The state needing care **is spelled out** in the insurance conditions

  or

- The state needing care **is linked to the public long-term care insurance system**

[2] Insurance money

-**Lump-sum amount**

→to be paid when persons first enter a state requiring long-term care

- **Subsequent amounts** (hereinafter referred to as “care annuity”)

→to be paid as long as the state requiring care persists.

3. Marketability of private long-term care insurance and contents of product

[3] Exemption from payment of premium

It is common practice to **waive payment of premium** when an insured person enters a state requiring long-term care.

[4] Insurance term

Often a long term, similar to that for **whole of life insurance**.

[5] Main contract or special contract

-**Stand-alone** long-term care insurance

-Long-term care insurance **as a special contract** under death insurance or medical care insurance

3. Marketability of private long-term care insurance and contents of product

[6] Underwriting method

- **Non-medical application case**

  An insurance company receives from an applicant a declaration form regarding his/her health condition.

- **Medical examination report case**

  The insurance company makes its determination based on the results of a medical examination by a doctor.

4.Issues from an actuarial point of view
(1) Calculation of premium rates

[1] Calculation method for the rate of incidence of persons requiring long-term care

- Most insurance companies do not have enough insurance payment records.
- One of the most important basic rates is **the rate of incidence of persons requiring long-term care**.
- However, **there are no general statistics such as "number of people who have newly entered a state requiring long-term care** per year" in Japan.

4.Issues from an actuarial point of view
(1) Calculation of premium rates

- In respect of products linked to public long-term care insurance, “the number of persons who are certified as requiring long-term care at some point” can be obtained.
- With some other basic rates, “the rate of incidence of persons requiring long-term care” can be calculated using the following formula…

4.Issues from an actuarial point of view
(1) Calculation of premium rates

<Definitions>

r_x : Rate of incidence of persons requiring long-term care at the age of x
(probability of newly entering a state requiring long-term care within a year)

j_x : Percentage of persons requiring long-term care at the age of x
(number of persons who are certified as requiring long-term care at the age of x /total population at the age of x)

q_x : Mortality rate at the age of x

q_x^{ii} : Mortality rate of persons requiring long-term care at the age of x

$$r_x = \frac{j_{x+1} \times (1 - q_x) - j_x \times (1 - q_x^{ii})}{(1 - j_x) \times (1 - \frac{1}{2} \cdot q_x^{ii})}$$

4.Issues from an actuarial point of view
(1) Calculation of premium rates

<Look at Appendix 1>

Number of persons requiring long-term care at the age of x+1

= [Number of persons who survive to the age of x+1 among the persons requiring long-term care at the age of x] …[1]

+ [Number of persons who enter a state requiring long-term care before the age of x+1 and survive to the age of x+1 among the persons who are not in a state requiring long-term care (healthy people)] …[2]

$$\rightarrow \quad l_{x+1} \times j_{x+1} = l_x \times j_x \times (1 - q_x^{ii}) + l_x \times (1 - j_x) \times r_x \times (1 - \frac{1}{2} q_x^{ii})$$

Substitute $\frac{l_{x+1}}{l_x} = 1 - q_x$ and rearrange r_x

$$r_x = \frac{j_{x+1} \times (1 - q_x) - j_x \times (1 - q_x^{ii})}{(1 - j_x) \times (1 - \frac{1}{2} \cdot q_x^{ii})}$$

4.Issues from an actuarial point of view

(1) Calculation of premium rates

$$r_x = \frac{j_{x+1} \times (1 - q_x) - j_x \times (1 - q_x^{ii})}{(1 - j_x) \times (1 - \frac{1}{2} \cdot q_x^{ii})}$$

- "Mortality rate (q_x)" can be obtained from general statistics or insurance records

- **But, how can we calculate**

"the mortality rate of persons requiring long-term care (q_x^{ii})" ?

→ One of the methods is **to estimate the difference between**

"the mortality rate of persons not requiring long-term care (q_x^{aa})"

and

"the mortality rate of persons requiring long-term care (q_x^{ii})"

…This method is shown in Appendix 2.

→It is an important challenge to estimate r_x very precisely, especially q_x^{ii} according to the above expression.

4.Issues from an actuarial point of view
(1) Calculation of premium rates

[2] Insurance payment period

- It is also important to take into account **how long a qualifying state requiring long-term care will last**.
- In long-term care insurance, it is common not to pay insurance money as long as the insured person remains in a state requiring long-term care."

→**Setting of "the mortality rate of persons in a state requiring long-term care (q_x^{ii})" also has important implications**.

4.Issues from an actuarial point of view
(1) Calculation of premium rates

[3] Reflection of uncertainty against probability oscillation and future environmental changes

- One frequently used method is **to add a certain percentage of standard deviation (σ)** to an expected value.

  Ex.) 2σ in assumed probability distribution.

- In this method, the extra premium standard can **vary greatly depending on how many contracts are expected.**

→Appendix 3

4.Issues from an actuarial point of view
(1) Calculation of premium rates

r_x : Rate of incidence of persons requiring long-term care at the age of x
(probability of newly entering a state requiring long-term care within a year)

σ_x : Standard deviation in the probabilistic distribution r_x is distributed. Where r_x shall be distributed according to a binomial distribution.

Where $\sigma_x = \left(r_x \cdot (1 - r_x) / N_x\right)^{\frac{1}{2}}$ (N_x equals the number of insured persons)

r_x' : $2\sigma_x$ is added to r_x as an extra premium

For example, at the age of 70, if Nx = 1,000, rx' will be about twice the value of rx. If Nx = 10,000, it will be about a 30% increase.

							Nx=1000		Nx=10000	
①Age	②jx	③qx	③αx	⑦qxii	⑥qxaa	⑦rx	⑧-1σx	⑨-1 rx'	⑧-2σx	⑨-2 rx'
70	0.01778	0.02123	6.43897	0.12305	0.01911	0.00449	0.00212	0.00872	0.00067	0.00583
71	0.02017	0.02361	6.18242	0.13029	0.02107	0.00522	0.00228	0.00978	0.00072	0.00666
72	0.02286	0.02615	5.93610	0.13732	0.02313	0.00605	0.00245	0.01095	0.00078	0.00760
73	0.02590	0.02895	5.69959	0.14459	0.02537	0.00701	0.00264	0.01228	0.00083	0.00868
74	0.02934	0.03208	5.47250	0.15229	0.02783	0.00812	0.00284	0.01379	0.00090	0.00991
75	0.03322	0.03555	5.25446	0.16031	0.03051	0.00940	0.00305	0.01550	0.00096	0.01133
76	0.03759	0.03939	5.04511	0.16863	0.03343	0.01088	0.00328	0.01744	0.00104	0.01295
77	0.04251	0.04368	4.84410	0.17742	0.03663	0.01258	0.00352	0.01963	0.00111	0.01481
78	0.04804	0.04856	4.65110	0.18703	0.04021	0.01456	0.00379	0.02213	0.00120	0.01695
79	0.05425	0.05402	4.46579	0.19716	0.04415	0.01683	0.00407	0.02497	0.00129	0.01941
(80)	0.06121									

4.Issues from an actuarial point of view
(2) Loss reserves

- Care annuities are paid for as long as insured persons are in the state requiring long-term care

  →The amount of payment reserves can often be very high.

- As a simple estimation method, it can be

  “payment amount per year multiplied by life expectancy of the insured person at the time of an event.”

→similarly to above, <u>the mortality rate of persons who require long-term care becomes important.</u>

4.Issues from an actuarial point of view
(3) Policy reserves

[1] Premium reserves ・・・ policy reserves for usually predictable risks

- In Japan,
  - ・the accumulation system
  - ・the assumed interest rate
  - ・the mortality rate

  to use for the purpose of premium reserve calculation are determined by laws and regulations.
- In respect of the rate of incidence of insured events, **a standard rate has not been determined** because the contents of products vary between insurance companies.

4.Issues from an actuarial point of view
(3) Policy reserves

[2] Contingency reserves

- Health insurances and long-term care insurances are susceptible to external factors such as political measures, and the insurance terms of many products last for the whole of life

  → **They contain uncertainty factors**.

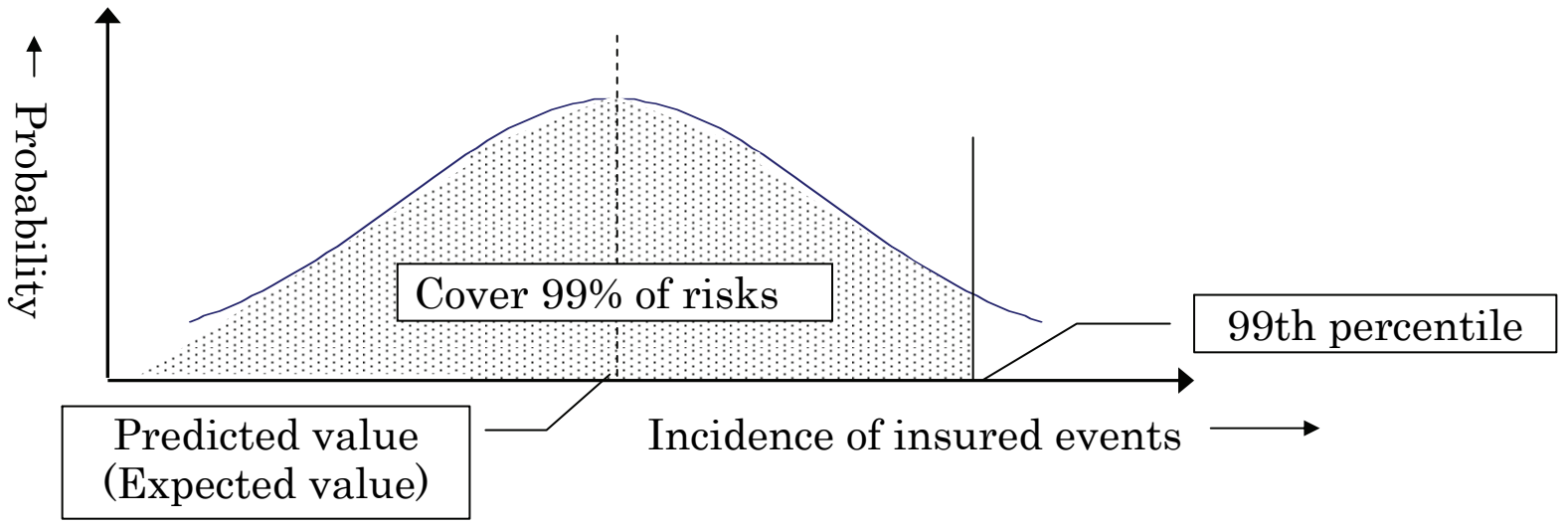
- On the other hand, there is no standard index for rates of event incidence.

- It is important to conduct adequate follow-up inspections on the rate of event incidence and to accumulate sufficient reserves to cover future insurance payments.

→ **Rules were established in 2007 on follow-up inspections**.

4.Issues from an actuarial point of view
(3) Policy reserves

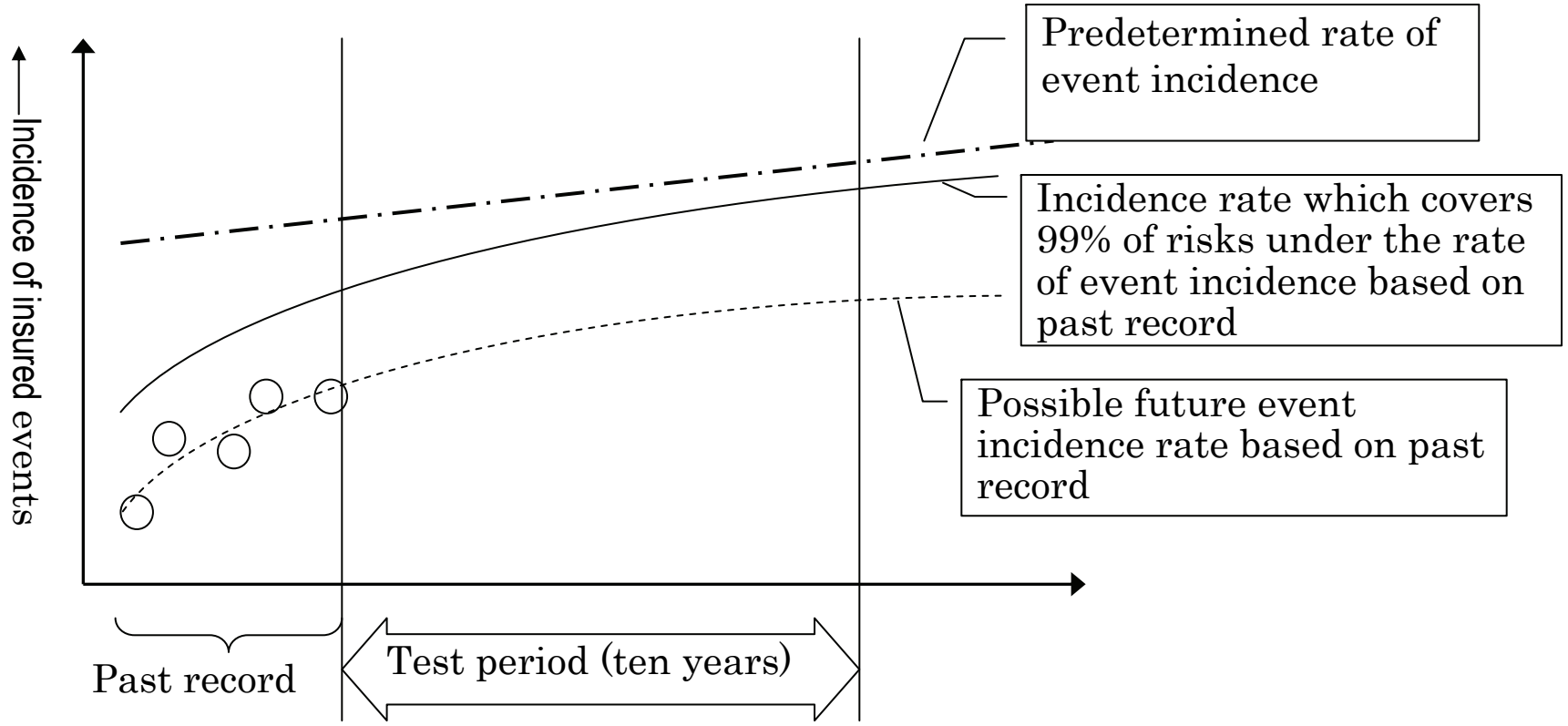
- Predict the rates of insured event incidence over the next ten years .
- Taking the probability oscillation into consideration, calculate a standard to cover 99% of risks over the next ten years.



- When the predetermined rate of event incidence set in advance to calculate premiums, etc. does not meet the standard to cover this 99%, contingency reserves are accumulated in order to maintain an adequate premium reserve.

4.Issues from an actuarial point of view
(3) Policy reserves

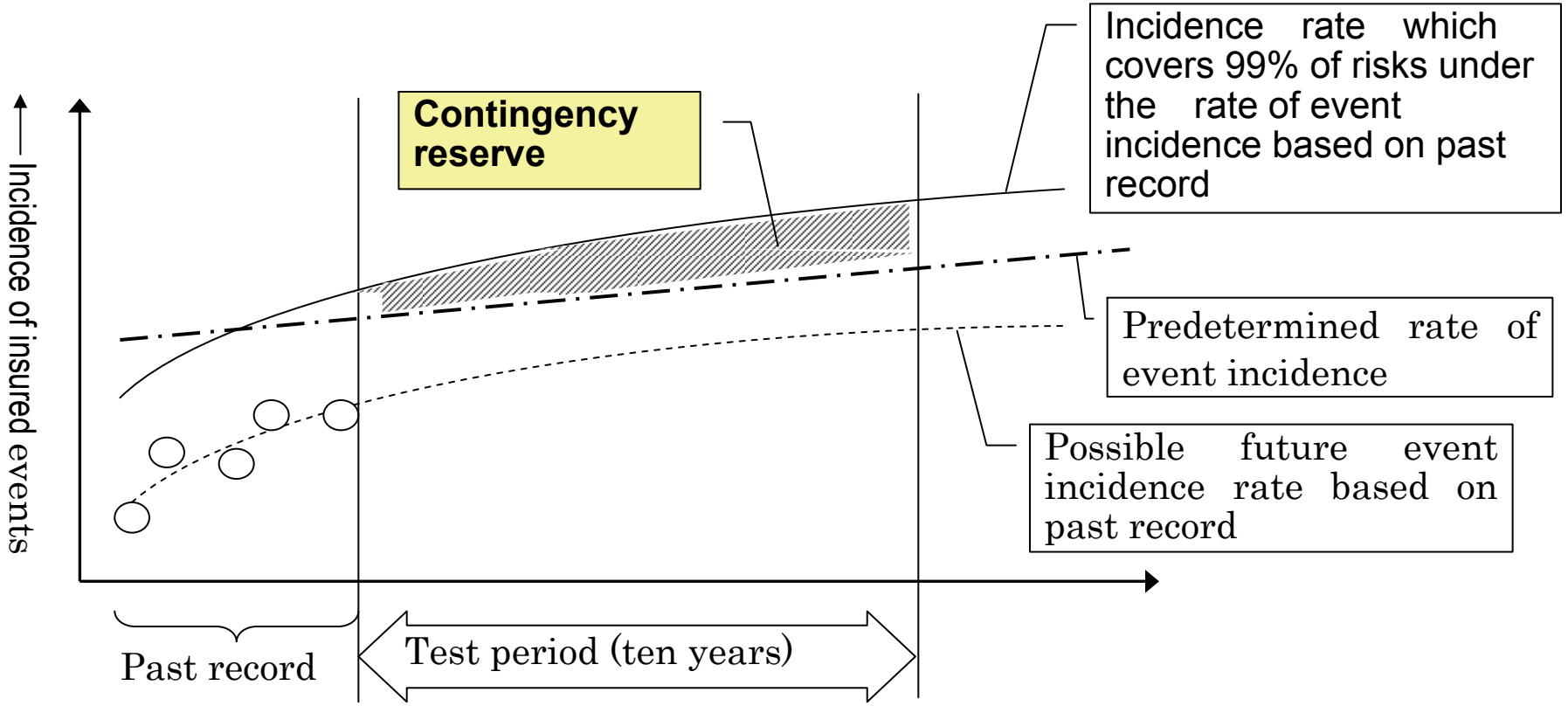
a. Cases where the predetermined rate of event incidence covers 99% of risks



⇒ **There is no need to accumulate contingency reserves**.

4.Issues from an actuarial point of view
(3) Policy reserves

b. Cases where the predetermined rate of event incidence cannot cover 99% of risks



⇒ **Contingency reserves need to be accumulated.**

5. Summary

- There is a growing need for long-term care insurance in Japan and the sector is expected to grow further in coming years.
- On the other hand, there are many issues regarding premium calculation, such as the fact that there are no hard data on the rates of incidence of states requiring long-term care.
- In addition, in light of future uncertainty, valuation of policy reserves is also important, given that many insurance contracts have very long terms.

→We actuaries must continue to calculate appropriate premiums, evaluate policy reserves, and manage risks with due consideration to both profitability and the soundness of insurance companies.