

Population distribution and business trend of life insurance in Japan

The Dai-ichi-life mutual insurance company

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1.Introduction

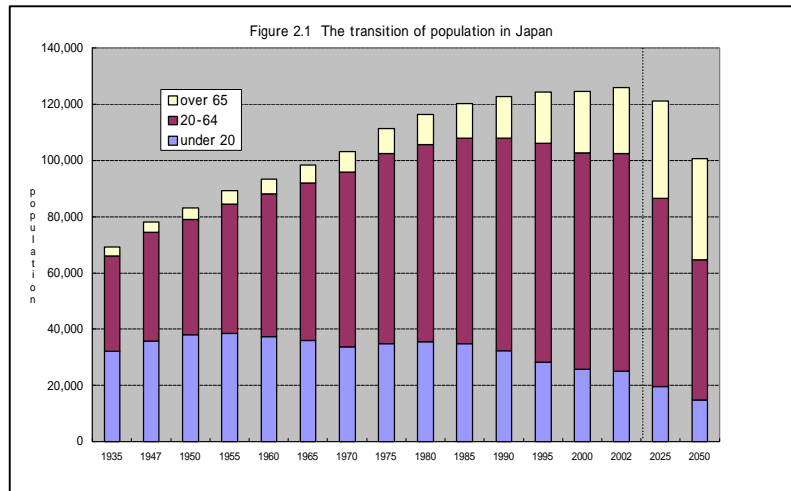
In Japan, people are becoming aging, getting married in older age, and having fewer children, so population distribution has been changing drastically these days. Therefore, a lot of problems are apprehended, in terms of social security and economic environment.

In such an environment, the life insurers that have sold mainly traditional life insurance products, such as whole or term life insurance, are getting to be forced to change their business model by the change of population distribution. The insurers have begun to cope with such an environment by developing new products such as medical insurance. However, there are a lot of problems such as volatility of future profit from medical insurance, compared to stable profit from traditional life insurance products.

In this article, we are going to introduce the summary of environments that have been mentioned above from actuarial point of view.

2. demography of Japan

Figure 2.1 shows the transition of population of each age bands in Japan after World War . The population, which had continued to increase, stopped increasing from 1980s. People under 20 are decreasing, while people over 65 are increasing. In 2002, people under 20 represent



approximately 20% of whole population, people over 65 represent 19%.

The future population of Japan is estimated to be 121,140K in 2025, 100,590K in 2050, which is about 80% of present population, and 36% of which is that of over 65. It is thought that Japan is becoming a super aging society.

There might be 2 reasons why population of Japan have changed and will change in this way.

(1) improvement of mortality rate

Figure 2.2 shows the drastic improvement of mortality rate after WW2. It has improved in each age bands, but especially over 60. As a result, the population of older people has unchanged. In such an environment, Japanese life insurance companies sold traditional life insurance such as endowment product, whole life product, and term life product, and made great profits, most of which were paid to policyholders as dividends.

Figure 2.3 shows the average lifetime expectancy, which has been longer and longer. Therefore, need for annuities and medical products after retirement is rising.

<Figure 2.2> The transition of mortality rate

• male (‰)

Age	1960	1965	1970	1975	1980	1985	1990	1995	2000
0	33.33	20.71	14.81	11.10	8.26	5.85	4.95	4.56	3.45
20	1.92	1.33	1.32	1.05	0.89	0.90	0.83	0.75	0.63
40	3.62	3.21	3.12	2.59	2.05	1.83	1.55	1.44	1.47
60	22.04	19.97	17.67	13.93	12.45	11.44	11.32	10.66	9.23
80	140.84	139.79	123.85	110.39	100.36	88.12	80.39	74.53	64.01

• Female

Age	1960	1965	1970	1975	1980	1985	1990	1995	2000
0	27.39	16.32	11.49	8.71	6.58	5.08	4.17	3.83	2.98
20	1.21	0.67	0.61	0.49	0.35	0.31	0.30	0.29	0.25
40	2.71	2.03	1.77	1.41	1.12	1.02	0.89	0.83	0.78
60	13.17	11.18	9.98	7.72	6.44	5.42	4.81	4.57	3.83
80	106.14	105.41	92.00	80.73	68.41	56.43	47.85	41.30	33.65

<Figure 2.3> The transition of average lifetime expectancy

• Male

Age	1960	1965	1970	1975	1980	1985	1990	1995	2000
0	65.32	67.74	69.31	71.73	73.35	74.78	75.92	76.38	77.72
20	49.08	50.18	51.26	53.27	54.56	55.74	56.77	57.16	58.33
40	31.02	31.73	32.68	34.41	35.52	36.63	37.58	37.96	39.13
60	14.84	15.20	15.93	17.38	18.31	19.34	20.01	20.28	21.44
80	4.91	4.81	5.26	5.70	6.08	6.51	6.88	7.13	7.96

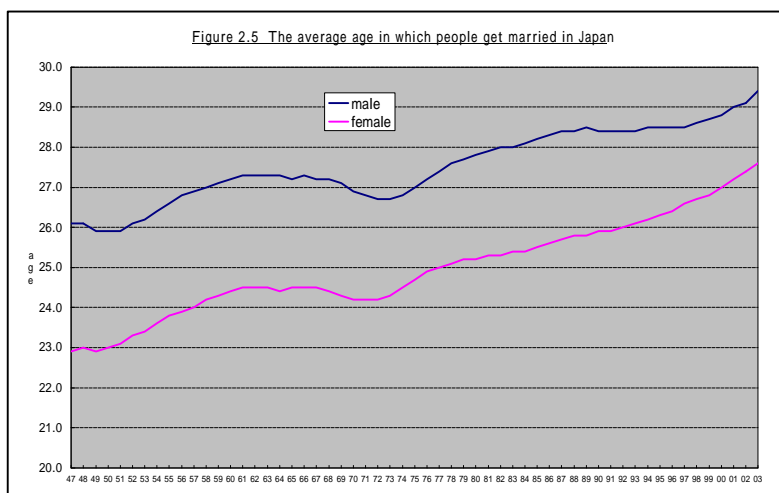
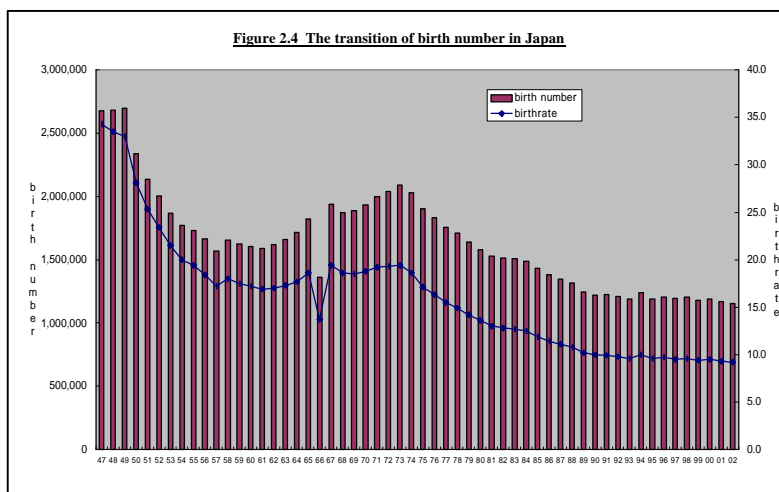
• Female

Age	1960	1965	1970	1975	1980	1985	1990	1995	2000
0	70.19	72.92	74.66	76.89	78.76	80.48	81.90	82.85	84.60
20	53.39	54.85	56.11	58.04	59.66	61.20	62.54	63.46	65.08
40	34.90	35.91	37.01	38.76	40.23	41.72	43.00	43.91	45.52
60	17.83	18.42	19.27	20.68	21.89	23.24	24.39	25.31	26.85
80	5.88	5.80	6.27	6.76	7.33	8.07	8.72	9.47	10.60

(2) decrease of birth number and birthrate

Figure 2.4 shows the transition of birth number in Japan. The birthrate of Japan was high right after WW2, which is called “baby boom”, and it became lower and lower. In 1970s, it became high, because baby boomer became grownup and had their children, which is called 2nd baby boom. After that, it became lower and lower, and it remain in low level. Thus, the population of younger ages has been decreasing. This, along with improvement of mortality rate, promotes aging society.

And there is another reason of less children in addition to the financial burden of educating children.



It is the average age in which people get married. Figure 2.5 shows the average age in which people get married. It became higher and higher by about 0.1 years every year in 1970s, and remained in the level in 1990s, and is getting higher recently. That of female is

getting higher and higher by about 0.1 years every year in this 30 years.

(3) comparison among some countries

Figure 2.6 and 2.7 show the comparison of demography between Japan and other countries. The change of Japan is drastic in terms of average lifetime expectancy, rate of the people over 65 and birth rate. Life insurance companies are required to deal with this fast changes.

<Figure 2.6> the comparison of average lifetime

	Male			Female		
	1950 ~ 55	1970 ~ 75	1995 ~ 00	1950 ~ 55	1970 ~ 75	1995 ~ 00
Japan	61.6	70.6	77.1	65.5	75.9	83.8
Canada	66.8	69.7	75.9	71.6	76.8	81.4
USA	66.1	67.8	73.2	72.0	75.4	79.1
France	63.7	68.6	74.2	69.5	76.3	82.0
German	65.3	67.9	74.2	69.6	73.8	80.4
Italy	64.3	69.2	75.0	67.8	75.2	81.4
Sweden	70.4	72.1	76.8	73.3	77.5	81.8
England	66.7	69.0	74.7	71.8	75.2	79.7
Australia	66.9	68.4	75.9	72.4	75.2	81.5

<Figure 2.7> the rate of the people over 65 and birth rate

	the rate of the people over 65(%)			birth rate(‰)	
	1950	1980	2000	1950	2000
Japan	4.94	9.10	17.34	23.7	9.6
Canada	7.67	9.40	12.62	27.8	11.6
USA	8.26	11.21	12.28	24.3	14.7
France	11.38	13.97	15.96	19.5	12.6
German	9.72	15.60	16.31	16.0	9.5
Italy	8.26	13.15	18.07	18.3	9.2
Sweden	10.25	16.29	17.40	15.5	10.3
England	10.73	15.07	15.86	15.9	12.3
Australia	8.13	9.59	12.30	23.0	13.5

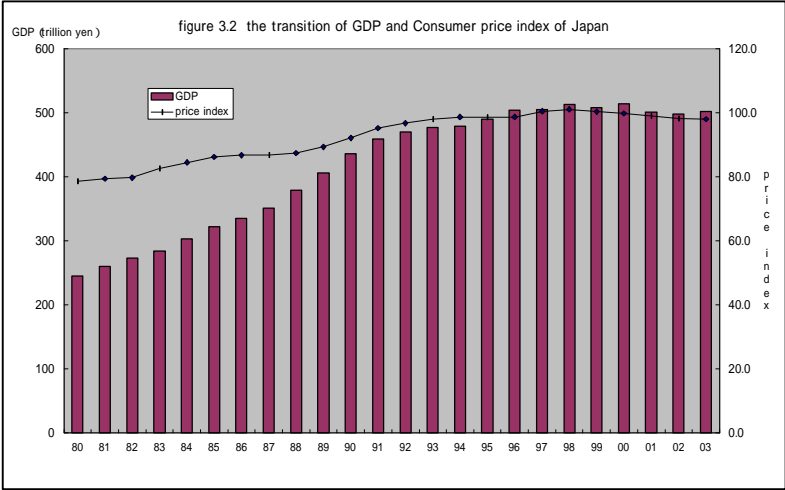
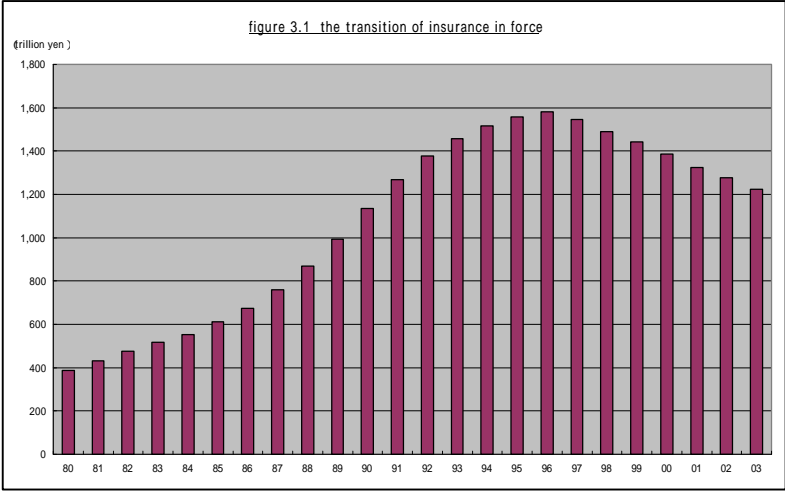
3. The change of life insurance business model in Japan

(1) the past business model

Japan is a country where most people have insurance policies, and about 90% family have some kind of policies, most of which are whole life policy with term life rider. From 20 to 65, when people work, they have high insurance coverage by attaching term life rider, and after that age, they only have whole life policy. Increase of population and pervasion brought by economic growth enabled life insurance companies to make a stable progress.

Most insurance companies sold endowment insurance after WW2. And in 1970s, they started to sell whole life insurances to meet

the needs brought by mortality improvement. After that, whole life insurance with term life rider became popular, which policyholders can have high insurance coverage with less premium, and insurance companies made a steady progress. And medical products had been sold as riders which are attached to life policy such as whole life and endowment.

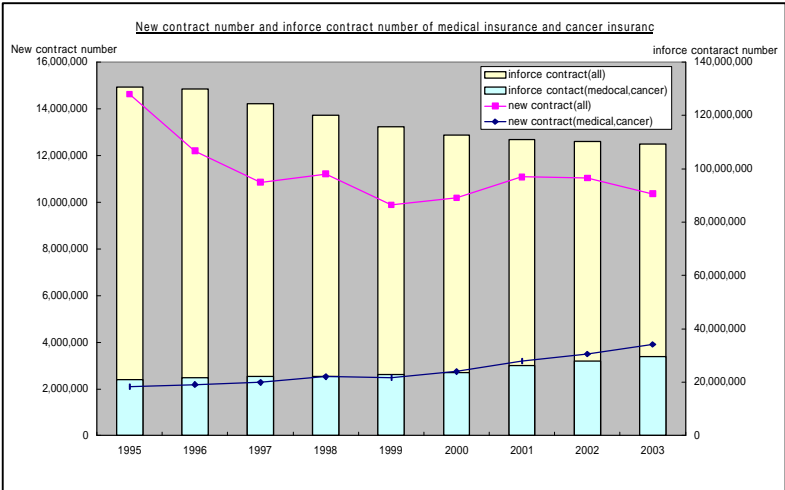


<figure 3.3 participation of life insurance>

	Participation rate	Participation Account	Matured Endowment (thousand yen)	Death Benefit (thousand yen)	Hospital benefit	Paying Premium (thousand yen)
the head of a household	85.3%	1.8	5,780	23,220	9,800yen	-
Spouse	74.8%	1.7	3,920	10,740	7,700yen	-
household	89.6%	4.3	10,010	36,970	20,200yen	531

(2) change of life insurance business model

However, people of 20s and 30s have been decreasing, and economy of Japan has been stagnant after the corruption of bubble, so holding contracts have been decreasing after 1996. Moreover, portfolio yield have been lowered because of the hovering of stock prices, and this influenced insurers drastically.



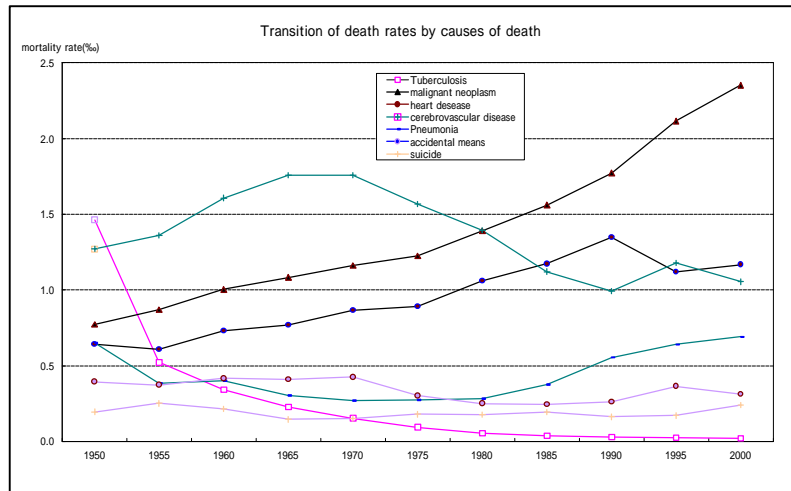
In such a circumstance, insurers gradually started to transform their business model from traditional life insurance to living benefit products, medical products and annuities. Figure shows that about 40% of new contracts are medical and cancer insurance, and 30% in terms of holding contracts. The number is that of stand alone policy and the riders that are attached to life insurance policies are not included.

Living benefit riders are becoming popular recently and more medical riders are becoming to be attached to life insurance policies.

(3) recent medical insurance

Critical Illness product

Figure shows the transition of main causes of deaths. Until WW2, infections such as tuberculosis were main causes, and after 1950s, cancer, heart attack and cerebrovascular diseases became main causes.



Products which pay benefits when diagnosed as

one of adult diseases were developed, and then such products which pay benefit annually were also developed, and these products became the basis of living benefit products.

About 1 second (47%) families have such living benefit policies.

Specified disability product

Specified disability products were introduced as a disability version of living benefit products, following critical illness products. Most policies pay benefits in the following situations,

When having treatments such as heart pacemaker, dialysis, artificial anus colostomy

When diagnosed as chronic symptom such as hypertension, diabetes mellitus, chronic renal failure, liver cirrhosis

When diagnosed as disability of function such as vision, audition, language and chewing.

In 2003, 18.0% of families have such policies and its is becoming pervasive.

Waiver of premium rider

When diagnosed as subscribed critical illness or disability, the premium of the policy is waived from that time.

Care product

Public care insurance system started in April of 2000, and some companies introduced new supplemental care products, they pay benefits which are lump-sum, annuity and waiver of premium, and most of them use the measurement of public system.

In 2003, 16.4% of families have such policies and its is becoming pervasive.

4. the regulation of valuation reserve in Japan

(1) before 1995

Before the March on 1996 when the regulation on insurance was changed, insurance industries in Japan reserved their valuation aiming at constant net premium system. In 1960's, the liability reserve of the insurance company was zillmerised reserve, and the constant net premium reserve was not achieved. On the other hand, shifting to the constant net premium reserve which was a lot of loads aimed at the restriction on a financial side of the new contract business expense for healthy development of the insurance company. However, the expensed mortality and interest assumption are the one that were used for pricing.

(2) in 1996

New Insurance Business Law was enforced in April, 1996. The maximum outline of the Insurance Business Law revision was to have improved the degree of freedom of the commodity and the price and to promote competition. On the other hand, to improve the health of the insurance company and to secure the solvency, a so-called standard valuation reserve system, the competent minister can do a necessary providing about the savings method and the calculation base rate level of the liability reserve of a long-term insurance contract, was installed. It is provided concretely as follows.

Object contract	Contracts to have concluded after April, 1996, and contracts other than the following <ul style="list-style-type: none">• variable life insurance• contracts that policy provisions are described that the assumed interest rate is revocable.• Contracts whose insurance period is five years or less
method	constant net premium reserve
Expensed mortality	Mortality rate that IAJ made and secretary of the Financial Services Agency verified
Interest Assumption	Contract to have concluded before March, 1999 since April, 1996 : 2.75% Contract to have concluded before March, 2001 since April, 1999 : 2.0% Contract to have concluded since April, 2001 : 1.5%

(3) Correspondence of the third field

Insurance companies were to have saved the liability reserve of the insurance commodity in the third field by the constant net premium reserve of the expensed mortality and interest assumption that were used for pricing at 1996. Regulations were revised when the assumed interest rate had to apply a standard interest rate as well as the first field commodity in April, 2001. The mortality was the same as one that was used for pricing because there were various incidences.

(4) role of appointed actuary

After 1996, roles of appointed actuary was strengthened.

- The liability reserve is properly saved according to the law
- The savings level of the liability reserve is enough by being analyze revenue and expenditure in the future, and considering the situation etc. of the property in the future

(5) contingency reserve

There was only the one that corresponded to the insurance risk in contingency reserve before 1995. The main risk of the life insurer was a change of the mortality rate so far, but the content of the risk of life insurance has changed by the change in finance and the economic ambience. Therefore, when Insurance Business Law was revised 1996, the object of contingency reserve was examined, and contingency reserve was arranged to contingency reserve which prepares for the insurance risk and to contingency reserve which prepares for the assumed interest rate.

5. Problem that actuary in Japan has faced

(1) Change in environment

the Program for Further Financial Reform

The Program for Further Financial Reform was made public by the Financial Services Agency in December, 2004. Afterwards, the work schedule for the implementation was made public in March, 2005, and there are “Promoting diversification and price flexibility in insurance products” and “Enhancement of other rules related to financial soundness of insurance companies, such as the technical provision for newly introduced insurance products and performance monitoring”. The environment starts changing greatly, such as the supervision of insurance business in order to promote the enhancement of internal system for development and management of insurance products, based on the principle of self-responsibility for each insurance company.

valuation reserve restriction concerning variable annuity

Securities and Exchange Law was revised, and the insurance commodity sales by the brokerage firm were lifted in December, 1998. The life insurer began the sale of the variable annuity insurance with this as a turning point. In addition, the Insurance Business Law enforcement rule was revised in October, 2002, and sales of the individual annuity insurance etc. by the bank were lifted. As a result, more insurance companies entered the variable annuity market, and the variation of the commodity became various.

<figure5.1 Transition of variable annuity sale count>

	2003	2004
New business	166,320	275,206
Policies in force	309,439	563,782

In past legal restrictions, the variable life insurance contract only had to save the reserved amount of each contract in the business end of fiscal year. With this, the reserve corresponding to the guaranteed minimum maturity benefit, the guaranteed minimum death benefit, the guaranteed minimum surrender benefit, and the guaranteed minimum income benefit that are a peculiar risk to the variable annuity cannot necessarily be done enough. Therefore, the restriction was revised as follows in fiscal year 2005.

Premium Reserve	<ul style="list-style-type: none"> The insurance company saves the amount in which a present value of the income is pulled from a present value of the expense for guaranteed minimum benefit, considering the volatility of special accounts, in addition to the reserved amount when it settles an account.
Contingency Reserve	<ul style="list-style-type: none"> Contingency reserve which it prepares for the lowest guarantee risk is newly established, in addition to contingency reserve and contingency reserve .

	<ul style="list-style-type: none"> •The savings standard is a difference between the income and the expense on guaranteed minimum benefit. •The savings limit is 6% of premium reserve.
Solvency Margin	<ul style="list-style-type: none"> • New establishment of guaranteed minimum benefit

(2) Current state and problem of liability reserve system concerning the third field

Current state and problem

Recently, the law maintenance is scheduled to be done while sales of the third field commodity become active.

Fiscal year 1996, the standard liability reserve system was introduced, and it was provided to use a standard interest rate and a standard mortality rate to evaluate the liability reserve for contracts of the first field after fiscal year 1996. However, the method of evaluating the valuation reserve in the third field is as follows.

Premium Reserve	<ul style="list-style-type: none"> •Third field commodities are objects of the standard valuation system, but standard morbidities doesn't exist. •Therefore, each company applies morbidities that obtained a license to authorities
Contingency Reserve	<ul style="list-style-type: none"> •As for the disease hospitalization risk, the disaster hospitalization risk, and the disaster death risk, the savings method is established by the law. •As for other risk, Each company saves it by the standard authorized to authorities.

Direction of examination

The study committee concerning valuation reserve rule of the third field and verification after the fact started in February, 2005. This study committee made the report in July. The content is as follows.

Premium Reserve	<ul style="list-style-type: none"> •Standard morbidities are not made now, because the content of the security of the third field commodity extends to many kinds and empirical data is not enough. •An enough savings level is secured by the verification after the fact. Insurance companies reports on the result of the verification after the fact to authorities. They indicates the rationality of the expected risk margin in the debt. •We reduce the mortality rate in consideration of the commodity characteristic of the third field.
Contingency	<ul style="list-style-type: none"> •The savings limit etc. are improved in consideration of a

Reserve	<p>peculiar risk (risk by the external factor not predictable) to the third field.</p> <ul style="list-style-type: none"> • An enough savings level is secured by the verification after the fact.
Enhancement of indication	<ul style="list-style-type: none"> • Indication revenue and expenditure situation, basic rate change articles, execution condition of verification after the fact
Monitor	<ul style="list-style-type: none"> • Verification of morbidities by insurance company • Regular monitor by authorities
Solvency Margin	<ul style="list-style-type: none"> • Improving of a present level because peculiar risks (risks by the external factor not predictable) to the third field is evaluated
Basic rate change right	<ul style="list-style-type: none"> • Clarification of exercise standard. Enough explanation when recruiting it. • Securing of propriety of exercise standard by indication of situation of incidence morbidities • Besides mechanism that basic rate change right is set, setting of high insurance and reduction after the fact according to dividend is thought.
role of appointed actuary	<ul style="list-style-type: none"> • Submitting of the opinion book concerning verification after the fact to authorities
Others	<ul style="list-style-type: none"> • Strengthening of internal risk management situation and product development situation • Risk move and risk interception by reinsurance, and appropriate indication

The correspondence of the above-mentioned is examined and maintained one by one after fiscal year 2005. Therefore, it is interesting how each company goes in the pricing and the sales policy.

(3) others (viewpoint that should be noted as actuary)

We should base the following viewpoints to succeed as an insurance company in the above-mentioned environment.

Necessity of accumulation of empirical data concerning advanced age

When we sell the commodity of the medical security in place of the commodity of the death security corresponding to changing the demographic structure, the sales target is changed from one's thirties since 40 years old. Especially when the age at entry is 60 years old or more, it is possible that enough empirical data has not been accumulated from the policy rider of the medical security with the death security insurance. Moreover, strict medical examination is done in the joining of the death security commodity, but there is a possibility that a large amount of sales by only declaration are done when the medical life insurance is sold. In this case, there is a possibility that the schedule incidence is greatly different, and the pricing that bases the above-mentioned point might be necessary.

Influence by advance in medical technology

The person who contracted the malignant growth died without fail before, but it is likely to cure and to live by the advance in medical technology now. The improvement of the mortality rate gives the effect opposite to the death security insurance because the commodity supplied when it is hospitalized is a pure endowment insurance. Moreover, there is a possibility that the pathogenesis and the hospitalization period change by the change in Medical Technology, so we should gaze at results more than the past.

Changing of non-retired population by change in national guarantee

There is a part to which the country responds about the aging problem, so the commodity that the life insurer sells might become a role to supplement the response of the country. In that case, it is necessary to think non-retired population is biased.

In Japan, people are becoming aging, getting married in older age, and having fewer children, so population distribution has been changing drastically these days. Therefore, a lot of problems are apprehended, in terms of social security and economic environment.

In such an environment, the life insurers that have sold mainly traditional life insurance products, such as whole or term life insurance, are getting to be forced to change their business model by the change of population distribution. The insurers have begun to cope with such an environment by developing new products such as medical insurance. However, there are a lot of problems such as volatility of future profit from medical insurance, compared to stable profit from traditional life insurance products.

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