

Analysis of Accident Insurance for Middle-aged and Older Adults in China Through Case Comparison

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Abstract. Accident protection for middle-aged and older adults is an important topic that people focus on, and accident insurance for middle-aged and older adults has gradually aroused people's interest. In the United States, Japan, and many countries, due to their maturity in the insurance industry, the insurance portfolio and process of accident insurance has become complete. However, in mainland China, accident insurance for middle-aged and older adults is still a relatively unpopular field, and most insurance companies have not invested in this area. This article lists three middle-aged and older adults accident insurance products from three different insurance companies to analyze the advantages and disadvantages of these products from the perspective of consumers through comparative analysis, put forward the possible reasons for the lack of investment in accident insurance for middle-aged and older adults in the mainland of China. The article finds that Chinese mainland insurance companies in the field of accident insurance for middle-aged and older adults have certain gaps due to factors such as excessive risk, immature development of the insurance industry, and lack of detailed division of risk situations. In addition, this article tries to put forward strategies to improve accident insurance for middle-aged and older adults. The purpose of this topic is to hope that domestic insurance companies and policyholders can pay more attention to the field of accident protection for middle-aged and older adults, carry out rational improvements, and enhance insurance services for consumers while improving the profits of insurance companies to achieve a win-win situation.

Keywords: Accidental Insurance; middle-aged and older adults; case comparison; insurance Industry; pricing.

1. Introduction

With the rapid deepening of aging in China, society's attention to middle-aged and older adult groups has gradually increased. Until 2020, the number of older adults who are 60 years old and above in China already reached 2.64 million people, which accounts for about 18.70% of the country's total population [1]. Accidental injury is a great hidden danger to the personal safety of middle-aged and older adults, which not only endangers the physical health of residents, but also brings heavy disease burden and economic losses to individuals, families, and society due to the consequences of accidental injury [2]. In response to concerns about accidental injuries, insurance is a market-oriented risk transfer mechanism, social mutual assistance mechanism, and social management mechanism, which plays an extremely important role in modern economic life [3]. Accident insurance is insurance with low premiums, flexible coverage, and strong protection function, with a wide range of social needs and a large number of customers [4]. Increasing attention to accident insurance for middle-aged and older adults is conducive to enhancing society's awareness of using market-oriented means such as commercial insurance to deal with accidental risks of middle-aged and older adults, providing protection for middle-aged and older adults, and promoting the development of China's insurance industry. From the existing research, it is found that although many institutions have made statistics on accidental injuries and deaths of older adults in China, with the enhancement of the risk management awareness of the whole society and the improvement of the attention to risk protection function of accident insurance, the original research and measurement of accident insurance incidence is not wide enough, the applicability is not strong enough, and the dynamic adjustment is not timely enough [4]. In addition, through the comparison of the investment status of mainland China and foreign insurance companies, there are still many shortcomings in the development of China's

insurance industry due to the short development history of China's insurance industry, the different investment structures of China and foreign insurance, and the difference in understanding of insurance pricing. At the same time, there is not much research about the insurance industry in the field of accident insurance for middle-aged and older adults in mainland China. Compared with life insurance and medical insurance, insurance companies in mainland China do not pay much attention to accident insurance, especially for middle-aged and older adults accident insurance. This article is inclined to study the common middle-aged and older adults' accident insurance and analyze the shortcomings of domestic insurance companies in this field. It is hoped that society will pay more attention to this aspect, and at the same time promote the comprehensive development of China's insurance industry.

The theme of this study is to compare the specific accident insurance products of different insurance companies, and then to analyze the shortcomings of China's insurance in the field of middle-aged and older adults accident insurance. Then, this article tries to make suggestions for improving middle-aged and older adults' accident insurance products in mainland China. This paper conducts three middle-aged and older adults accident insurance products such as Taiping Good Parents Comprehensive Accident Insurance, Pingan Middle-aged and Older adults Accident Insurance, and Middle-aged and Older adults Accidental Injury Insurance, from three different famous insurance companies. Comparing the tariff, insurance amount, coverage term, coverage region, and policyholder's limitation, the advantages and disadvantages of those three products are seen. Through the comparison of these three insurance products, the analysis of Chinese insurance companies in accident insurance for middle-aged and older adults found that there are problems such as a lack of risk segmentation and inappropriate pricing, etc. Extending the comparison of accident insurance in Hong Kong and mainland China for middle-aged and older adults, this paper finds out the differences between Chinese insurance and Hong Kong and puts forward suggestions for improvement.

2. Comparison of Three Middle-aged and Older Adults' Accident Insurance

2.1. Three insurance companies

In China, People's Insurance Company (Group) of China Limited, Ping An Insurance (Group) Company of China, LTD, and China Taiping Life Insurance Co., Ltd. are all top insurance companies and enjoy excellent reputations in insurance markets. The People's Insurance Company (Group) of China Limited, as called PICC, was listed on the Shanghai Stock Exchange in 2018, becoming the fifth "A+H" share-listed insurance company in China. Ping An Insurance (Group) Company of China, LTD, also called Pingan Insurance, was born in 1988. Ping An Insurance is the first joint-stock insurance enterprise in China, which has developed into a diversified integrated financial service group and is involved in many financial businesses, such as finance, insurance, banking, and investment. China Taiping Life Insurance Co., Ltd., also called Taiping Life, is the first multinational financial and insurance group company in China. Taiping Life is the first Chinese insurance company listed overseas in China's insurance industry, ranking 392nd on the Fortune Global 500 list in August 2020. In this article, three accident insurance products for middle-aged and older adults from the above three insurance companies will be selected for comparative analysis.

2.2. Three Middle-aged and Older Adults' Accidental Insurance Products

The three middle-aged and older adults accident insurance products selected in this article are Taiping Good Parents Comprehensive Accident Insurance, which is from Taiping Life, Ping An Middle-aged and Older Adults Accident Insurance, which is from Pingan Insurance, and Middle-aged and Older Adults Accidental Injury Insurance, which is from PICC. Those three types of accident insurance are short-term insurance. All those three products have 1 year coverage period. The coverage terms of those products include accidental death, accidental disability, accidental hospitalization, etc. Among them, both Taiping Good Parents Comprehensive Accident Insurance

and Middle-aged and Older Adults Accidental Injury Insurance contain three plans with different prices, while Pingan Middle-aged and Older Adults Accident Insurance has only one plan.

3. Consumer’s Perspective

From the consumer's perspective, policyholders focus on insurance tariffs, coverage, deductible, reimbursement ratio, and so on. As consumers, policyholders prefer cost-effective insurance products.

3.1. Prices of Three Middle-aged and Older Adults Accident Insurance Products

The insured age ranges of those three products are close but not the same. The insured age of Taiping Good Parents Comprehensive Accident Insurance is from 50 to 80 years old, the insured age of Pingan Middle-aged and Older Adults Accident Insurance is from 45 to 80 years old, and the insured age of Middle-aged and Older Adults Accidental Injury Insurance is from 45 to 79 years old. Among those three products, the insured age range of Taiping Good Parents Comprehensive Accident Insurance is the narrowest and the difference in insured age ranges for Pingan Middle-aged and Older Adults Accident Insurance and Middle-aged and Older Adults Accidental Injury Insurance is only 1 year old.

Below are tariff tables 1-3 for the three insurance products.

Table 1. Tariff Table of Taiping Good Parents Comprehensive Accident Insurance [5]

Age	Plan 1	Plan 2	Plan 3
50-59	66	86	146
60-69	106	136	226
70-80	186	246	426

Table 2. Tariff Tables of Pingan Middle-aged and Older Adults Accident Insurance [6]

Age	Male	Female
45	166.7	104.45
46-50	188.05	126.3
51-55	211.8	150.05
56-60	250.6	192.45
61-65	304.05	245.2
66-70	364.65	325.05
71-75	428.55	418.15
76-80	533.25	509.35

Table 3. Tariff Tables of Middle-aged and Older Adults' Accidental Injury Insurance (data from PICC official mini program, which introduces Middle-aged and Older Adults' Accidental Injury Insurance)

Age	Plan 1	Plan 2	Plan 3
45-60	89	179	289
61-70	139	229	369
71-79	199	279	469

As the insured age increases, the price of the three products gradually increases. Among the three products, both Taiping Good Parents Comprehensive Accident Insurance and Middle-aged and Older Adults Accidental Injury Insurance contain three different plans with different prices, and then the insured prices of those two products are divided into three levels according to three different age groups. Simply comparing these two types of insurance, the price of Taiping Good Parents Comprehensive Accident Insurance is slightly lower than that of Middle-aged and Older Adults

Accidental Injury Insurance. In addition, besides increasing prices according to increasing age, the prices of Pingan Middle-aged and Older Adults Accident Insurance are also distinguished by gender, and it is seen from the table that the price of insurance for men is higher than that for women in the same year period.

3.2. Comparison of Basic Protections of Various Insurance Liabilities

For the three types of accident insurance, Middle-aged and Older adults Accidental Injury Insurance covers the most unexpected situations. Middle-aged and Older adults' Accidental Injury Insurance and Taiping Good Parents Comprehensive Accident Insurance both have insurance claims for accidents caused by specific places and transportation, while Taiping Good Parents Comprehensive Accident Insurance does not have insurance liability for accidental death and accidental disability. The insurance content of Pingan Middle-aged and Older Adults Accident Insurance is relatively general and simple, which only has liabilities for accidental death, accidental disability, fracture allowance, and accidental hospitalization.

Below are three insurance claims and liabilities tables 4-6 for the three insurance products.

Table 4. Insurance Liability of Taiping Good Parents Comprehensive Accident Insurance [5]

Insurance Liability	Basic Insured Amount of each insurance liability (RMB)		
	Plan 1	Plan 2	Plan 3
Accident Insurance Benefits for Passenger Truck/Passenger Ship	50000	50000	100000
Accident Insurance Benefits for Rail Transit/Aviation	-	200000	400000
Accident Insurance Benefits for Certain Public Places	-	200000	400000
Medical Insurance Benefits for Accidental Fractures	5000	5000	10000
Accidental Fracture Hospitalization Allowance Insurance	-	50/day	100/day

Table 5. Insurance Liability of Pingan Middle-aged and Older Adults Accident Insurance [6]

Insurance Liability	Basic Insured Amount of each insurance liability (RMB)
Accidental Death	50000
Accidental Disability	100000
Fracture Allowance	2000
Accidental Hospitalization	2000

Table 6. Insurance Liability of Middle-aged and Older Adults Accidental Injury Insurance (data from PICC official mini program, which introduces Middle-aged and Older Adults Accidental Injury Insurance)

Insurance Liability	Basic Insured Amount of each insurance liability (RMB)		
	Plan 1	Plan 2	Plan 3
Death or Disability Caused by Accidental Injury on Flight	1000000	2000000	3000000
Death or Disability Caused by Accidental Injury on Trains and Ships	100000	200000	300000
Death or Disability Caused by Accidental Injury in Cars	50000	80000	100000
Accidental Fractures and Dislocations	5000	8000	10000
Accidental Death/Disability	50000	100000	150000
Death from Acute Illness	50000	100000	150000
Reimbursement of Unexpected Medical Expenses	10000	20000	30000

Compared with the basic insurance amounts of the insurance liabilities of those three products, the insurance amount of Middle-aged and Older Adults Accidental Injury Insurance is the largest one. Even Plan 1 of Middle-aged and Older Adults Accidental Injury Insurance, which has the lowest price level, except for accidental death, has a higher basic insurance amount than the insurance amount of Pingan Middle-aged and Older Adults Accident Insurance. In addition, Plan 2 and Plan 3 of Middle-

aged and Older Adults Accidental Injury Insurance's insured amount is higher than that of Pingan Middle-aged and Older Adults Accidental Injury Insurance in all aspects. At the same time, comparing Middle-aged and Older Adults Accidental Injury Insurance and Taiping Good Parents Comprehensive Accident Insurance, the insurance amount of Middle-aged and Older Adults Accidental Injury Insurance is almost higher than that of Taiping Good Parents Comprehensive Accident Insurance.

The coverage terms of Taiping Good Parents Comprehensive Accident Insurance and Pingan Middle-aged and Older Adults Accident Insurance are not as comprehensive as that of Middle-aged and Older Adults Accidental Injury Insurance. At the same time, the focuses of those two products are different. Taiping Good Parents Comprehensive Accident Insurance is inclined to various traffic and specific place accidents and is suitable for policyholders who like to travel, go out to work, or do outside activities. The audience of Pingan Middle-aged and Older Adults Accident Insurance is relatively broad.

Comparing the tariff table and various insurance liabilities of the three types of insurance, from the standpoint of policyholders, Pingan Middle-aged and Older Adults Accident Insurance is not recommended, because this product covers relatively less liability and policyholders need to pay relatively high costs and gets relatively less insurance claims. Middle-aged and Older Adults Accidental Injury Insurance has the highest price, while it covers the widest liability and has the highest insurance claims in the three products. Taiping Good Parents Comprehensive Accident Insurance has the lowest price, but the covered liability and insurance claims are relatively objective, so if policyholders are not willing to pay too much, this product can also be chosen.

In addition, although the three insurance products listed above have their characteristics, they do not provide sufficient details on the insurance liability and specific risk groups. Some products only divide the tariff according to age and ignore gender, while one focuses on gender, but the classification of insurance liabilities is too crude. At the same time, the above three products have some limitations. Only the Chinese can purchase those products, the coverage region of those products is only in China, all three are only guaranteed for one year, and all of them are claimed according to the insurance amount, which means a lack of financial management functions such as dividends. These shortcomings are not friendly to policyholders.

4. Insurance Companies' Perspective

From the perspective of insurance companies, the analysis of these three insurance products needs to measure the profits that those products bring to insurance companies. There are relatively few insurance plans for the older adults on the market, and the following are common reasons:

4.1. High Risk

Older adults have a high incidence of diseases and accidents, so the risk is higher than younger, in which case, if older adults are not within the age range specified in the insurance terms, the insurance company will not accept them.

Mortality varies with age and gradually rises in China. From 2009 to 2020, the mortality rate of older adults in China increased with age, and the peak mortality rate of the age group over 85 years old reached the highest [7].

The accident rate and mortality rate of middle-aged and older adults are higher than those of young people, and this high risk makes insurance companies difficult to grasp when formulating accident insurance for middle-aged and older adults. For insurance companies, the claim risk of middle-aged and older adults accident insurance is also higher than that of ordinary accident insurance. Due to the high risk of the audience, the price of the relevant insurance products increases.

4.2. High Insurance Rates

Some insurance companies have tried to tailor insurance plans for older adults, but compared with younger insurance, the insurance fee for elders has increased by more than several times. The premium is relatively expensive, so it is difficult for policyholders to accept.

High insurance pricing has led to the reluctance of some consumers to purchase related products which increases the difficulty of insurance companies in the development of accident insurance for middle-aged and older adults. In China, among large insurance companies, the products of middle-aged and older adults accident insurance are still niche and most of them are short-term products

4.3. Short Development History

The development history of China's commercial insurance is relatively short, and the accumulation of risk data for the older adult group is insufficient, so they dare not easily enter this business. The insurance industry in many developed countries has a long history and the insurance markets of them are huge, such as the United Kingdom, which has an insurance history of more than 300 years. The premium income of developed countries such as the United Kingdom, the United States, and Japan accounts for more than 10% of their gross national product on average, and the insurance, banking, and securities industries together constitute the modern financial system of these countries [3]. China's insurance industry started late, with a history of just over 30 years since the resumption of insurance business in 1980, so it is still in its infancy of development, and its per capita premium income is much lower than that of developed countries [3] (Table 7).

Table 7. Comparison of Average Returns on Investment by Insurance Companies by Country [8]

Country	US	UK	Japan	China
Average Returns on Investment	11%	13%	8%	5.60%

Compared with the insurance investment in China, the United States the United Kingdom, and other countries, the return on investment of China's insurance funds is below 6%, which is much lower than the investment rate of developed countries such as the United States, Japan, and the United Kingdom. In China, insurance companies invest most of their funds in short-term government bonds and bank deposits and loans with low yields, and more than 60% of China's insurance funds are medium and long-term life insurance funds, while the matching medium and long-term asset allocation is less, and the unreasonable allocation of assets and liabilities affects the investment and utilization efficiency of insurance funds. At the same time, the capital utilization rate of Chinese insurance companies is low. Most of the capital utilization rates of foreign insurance companies such as the United States and the United Kingdom are above 90%, especially Japan's life insurance capital utilization rate is as high as 95%, while China's insurance capital utilization rate is less than 60% [8]. There is a certain gap in the development of China's insurance industry with the United States, Japan, and other countries, while at the same time, there is a gap in insurance services and perfection parts between the Chinese mainland insurance companies and Hong Kong.

Taking Hong Kong's insurance companies as an example, they have many differences in insurance products from those of mainland China. The vast majority of mainland China's insurance plans currently only cover Chinese coverage, while most of Hong Kong's insurance products are global coverage. Commercial insurance in mainland China is generally limited to Chinese can be purchased, while insurance in Hong Kong does not have this restriction. Policyholders with Hong Kong's insurance products can receive dividends and interest, which means they can gain both money and protection, while many insurance companies in mainland China do not pay dividends, and the insured amount is fixed, which is not comparable to Hong Kong's insurance in terms of anti-inflation.

As far as investment capacity is concerned, insurance companies in China are subject to the restrictions of investment scope, and at present, their main investment allocation is still fixed-income assets, such as currency-based gold, bank savings, and other low-risk and low-yield products. The proportion of equity products shall not exceed 30% [9].

Hong Kong's international insurance market is also less restricted by investment targets. Global investment under the background of globalization is an important support for Hong Kong insurance companies' financial factors such as profits, compensation funds, dividend leverage, and so on. Policyholders in Hong Kong can allocate assets and hedge risks globally. This directly leads to a lower rate of return for mainland insurance products than Hong Kong products [9].

Usually, due to the fierce insurance competition in foreign markets, as well as the incidence of life expectancy diseases and other factors in various places, the price of foreign insurance will be cheaper than the insurance of Chinese companies.

The slow development of insurance and the restrictions on China's insurance investment structure system have also led to the incompleteness of Chinese insurance companies in the relative niche field of middle-aged and older adults' accident insurance.

5. Suggestions for Middle-aged and Older Adults Accident Insurance

Improving accident insurance for middle-aged and older adults not only reduces the economic burden on families and society but also creates profits for insurance companies and promotes the development of China's insurance companies. Insurance pricing is an important part of insurance products.

In general, pricing analysis makes an equilibrium between the premium paid by policyholders and the risk assumed by the insurance company [10].

Usually, insurance companies need to design a tariff structure, which will fairly distribute the burden of claims among policyholders [10]. For making a suitable distribution, actuaries need to make a model that considers the relationship between insurance tariff, probability of risk occurrence, frequency, and cost of claims [10].

The principle of a pricing process that involves several stages is the foundation for the calculation of a differentiated premium within the insurance portfolio. Usually, insurance companies make a priori analysis, which involves the segmentation of the risk's ensemble depending on the influencing factors, then each group includes the insureds with similar risk profiles and pays the same reasonable insurance premium [10]. Multiplying the conditional expectation of the claim's frequency with the expected cost of claims, basic elements of the pure premium are obtained. In this case, by determining the observable factors of the insured risk, insurance companies will find the existence of a data correlation and then make suitable insurance products [10].

In addition, insurance pricing should consider the predictive power of the individual history of the insured, so that to obtain a reasonable risk classification, a posteriori analysis allows the correction and adjustment of a priori tariff. Considering the observable risk and future predictive risk, the result is defined as the product of risk estimation [10].

According to the probability of accidents among middle-aged and older adults in China and the relevant theories of insurance pricing, a more detailed division of various insurance liabilities is an initiative that benefits both consumers and insurance companies.

Using Joinpoint 4.9.1.0 to calculate Annual Percentage Change (APC) and Average Annual Percentage Change (AAPC), from 2009 to 2020, the crude mortality rate of injuries among older adults in China decreased from 139.52/100,000 to 130.73/100,000, with the crude mortality rate of men being higher than that of women, the crude mortality rate in rural areas being higher than that in urban areas, and the crude mortality rate in the eastern region was higher than that in the central and western regions[7].

At the same time, according to the accident insurance claim cases collected in 2021, among the accidental death claims, traffic accident death claims accounted for 43%, and ordinary accidental death claims accounted for 57%. The proportion of common accidental death claims for men is higher than that of women, with 59% for men and 51% for women. With the increase of age, the proportion of traffic accident death compensation shows a trend of first increasing and then decreasing; The

proportion of traffic accident death claims for those under the age of 20 and over 70 years old is significantly lower than that of other age groups [4].

Insurance companies can divide middle-aged and older adults to be different groups according to age, gender, and different regions. Then insurance companies can adjust the product prices according to the mortality rate and disability rate for different groups. Moreover, according to the probability of various accidents occurring in middle-aged and older adults, insurance companies can separate different insurance liabilities and corresponding amounts in more detailed cases.

For that measure, insurance companies can list accidental falls, traffic road accidents, suicide, and suicide sequelae into insurance liabilities, and targeted improvement of insurance pricing by using actuarial modeling. Having more accurate statistics on the accidental expectancy and incidence of policyholders can help insurance companies reduce rates and better risk management.

For insurance companies, a more detailed formulation of various types of insurance liability and insurance amount is not only conducive to attracting customers but also can formulate more suitable insurance plans to obtain profits. For consumers, a more comprehensive scope of protection can also enable policyholders to better face accidents in different situations. At the same time, making insurance liabilities more detailed also clarifies the scope of liability of both parties, which relatively reduces disputes caused by the division of liability when making claims.

6. Conclusion

Through research, this paper finds that three middle-aged and older adults' accident insurance from three insurance companies have their characteristics, but all of them are careless in pricing and risk segmentation. In addition, they have the same shortcomings in that all of them can only choose the 1-year short-term period coverage term, all of them are only purchased by Chinese, and the coverage is limited to China, with no additional financial features. These shortcomings are also gaps in casualty insurance for most insurance companies in mainland China. Compared with Hong Kong insurance products, insurance products in mainland China are significantly different from overseas insurance products due to excessive risk factors, unreasonable pricing, imperfect development of the insurance industry, and restrictions on investment scope. It is hoped that China's insurance companies refine risk classification, rationalize insurance pricing, and make consumers' insurance standards more comprehensive while ensuring the interests of insurance companies. The main contribution of this paper is to pay attention to the current situation and shortcomings of Chinese middle-aged and older adults' accident insurance products, which is conducive to the thinking of insurance companies and consumers in the field of middle-aged and older adults' accident insurance.

The current study lacks specific product studies in the United States, Japan, and other countries. Also, this article only analyzes three products, which are insufficient examples in the field of accident insurance for middle-aged and older adults, which may have some impact on the conclusions. Besides them, the analysis of Chinese and foreign financial investment restrictions is not covered, and different national business policies may lead to different developments in the insurance industry. Future research should list more comprehensively the product planning and investment of major insurance companies in older adults' accident insurance and conduct a more detailed analysis.

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