

Analysis of Demand for Long-Term Care Insurance in Wenzhou

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Abstract: In the context of the accelerated aging of Chinese society and the requirements of the Central Economic Work Conference to prevent major risks, this paper explores the long-term care insurance system of Wenzhou based on the data of the seventh census of Wenzhou in 2020, and analyzes the scale of the disabled elderly in Wenzhou, and thus derives the future demand for long-term care, and designs the corresponding contribution scheme while predicting the future cost of long-term care.

Keywords: Long-Term Care Insurance, Disability, Contribution Mechanism.

1. Introduction

Wenzhou seventh census data show that the proportion of the population aged 65 years or older is 11.71%, according to the World Health Organization for aging society subdivision standards, Wenzhou has entered the first stage of aging society, and the speed of aging continues to accelerate, of which the number of unhealthy and unable to take care of themselves 65 years of age or older is 30,960, accounting for 2.91% of the elderly population. According to the 2020 health-related monitoring data announced by Wenzhou Center for Disease Control and Prevention, the per capita life expectancy of Wenzhou residents reaches 81.72 years in 2020, which is 0.01 years higher compared to 2019, and along with the continuous improvement of the medical and health system, it can be expected that the per capita life expectancy will be further improved. Aging and longevity of the population development pattern characterized by multi-health status gradually appear, the number of disabled elderly people who need long-term care will only increase in a long period of time. The economic situation of "aging before wealth" poses a serious challenge to the scale and structure of demand for long-term care resources.

Since Wenzhou has been exploring the establishment of long-term care insurance system since 2019, although there are specific policy guidelines, but there is still a need to fully justify the overall institutional arrangements for the operation of long-term care insurance, human resource allocation, etc., in which the cost of future long-term care for the disabled elderly is measured and the corresponding design is made. This is of great practical significance to the long-term and comprehensive roll-out of long-term care insurance in Wenzhou, and to enhance the sense of security and well-being of Wenzhou people.

2. Long-Term Care Insurance Costs

2.1. Prediction of the Size of Disabled Elderly

In order to predict the size of the disabled elderly, it is necessary to set up a life table and a disablement incidence table first. In this paper, the life table is CL10-13 Protection. The incidence of disability table is prepared by using the data

of the 7th Wenzhou census for a 10% sample of the elderly population aged 65 and above by age, sex and health status, and the elderly are classified into four states: healthy, basically healthy, unhealthy but able to take care of themselves, unhealthy and unable to take care of themselves, and the unhealthy and unable to take care of themselves are defined as The elderly aged 65 and above were defined as disabled elderly and it was assumed that the health transfer status would not change in the predicted year, and the incidence table of disability by age and sex was predicted. Then, using the seventh census of Wenzhou city as the base data, we used the population age shift algorithm to project the future population of Wenzhou city by age and sex, and predicted the scale of disabled elderly by age and sex.

Defined metrics.

The age of x and the maximum age is ω The x the age mortality rate is q_x The number of survivors at age x is l_x ; The number of survivors aged x in i state is $l_{x,i}$; The probability that a person at the age of x survives for another t year is ${}_t p_x$, and the proportion of people in i state is ω_i of which i there are 2 states, healthy for a , disabled for b , $\sum_i \omega_i = 1$

$$l_x = l_{x-1} \times (1 - q_{x-1}) \quad (1)$$

$$l_{x,i} = l_x \times \omega_i \quad (2)$$

From Table 1, we can see that the number of disabled elderly population in Wenzhou is increasing, and the growth rate becomes faster, up to 37,458 people in 2040, accounting for 1.83% of the total elderly population. The elderly who are unhealthy but can take care of themselves have a great probability of generating care needs in the future. If this group is included in the range of potential disabled people, the number of disabled elderly will be as high as 181,672 in 2040, accounting for 8.88% of the total elderly population, with a large scale of disabled elderly and a strong demand for care.

Table 1. Number of disabled people in 2020-2040

Year	Number	Year	Number	Year	Number
2020	17239	2027	22699	2034	31002
2021	17806	2028	24033	2035	32098
2022	18533	2029	25287	2036	33141
2023	19377	2030	26385	2037	34002
2024	20127	2031	27620	2038	35157
2025	20992	2032	28758	2039	36430
2026	21630	2033	29925	2040	37458

Under the influence of traditional thinking such as raising children for the elderly, the elderly tend to age at home, while in recent years the family structure in China tends to be simpler and the labor participation rate of women is increasing, the human resources for family care are insufficient and the care function of family is weakened; in addition, with the increasing price of living and care equipment, the care cost of the disabled elderly is high. The supply of long-term care for the disabled elderly is insufficient.

Long-term care insurance, on the other hand, effectively alleviates the conflict between the demand side and the supply side of disability care. Instead of simply giving cash to the disabled, it provides professional long-term care services to the participants by purchasing services. Care services are provided by designated care service providers, and professional caregivers can come to the home to provide services for the disabled at home or in institutions, greatly reducing the pressure of care for disabled families.

2.2. Cost Forecast of Care for Disabled Elderly

In a study of the cost of care in rehabilitation and nursing homes in Beijing, Xie Hong et al. (2011) [8] found that the cost of care for people with mild disability was 1800 RMB/month and 2200 RMB/month for those with severe disability; Chen Lu's (2013) [5] study concluded that the cost of half care in 20 nursing homes in Beijing was 1000 RMB/month and the cost of full care was 1500 RMB/month, with people with mild disability in general receiving half care, while the severely disabled people received full care. Mi Hong et al. (2020) [9] predicted that the average long-term care spending per person in Zhejiang Province was 20,000 RMB/year; Qingdao was one of the first cities in China to explore long-term care insurance, and the life care treatment for disabled level 5 insured workers was set at the standard 1500 RMB/month (50 RMB/day).

Wenzhou City stipulates that the treatment of long-term care insurance in the pilot phase is the care method times the average monthly salary of the on-the-job workers in Zhejiang Province in the previous year times the level of disability, and the treatment payment ratio is different for the participants who choose different care methods. If you choose home care, the reimbursement rate is 40%. The higher the level of disability, the higher the protection treatment. The maximum limit of long-term care insurance for severe level 1, level 2 and level 3 is 50%, 40% and 30% of the average monthly salary of the workers on duty in the province respectively. Taking into account, this paper sets the average treatment of long-term care insurance in Wenzhou in 2020 at 1900 RMB/month, and the average treatment growth rate refers to the average growth rate of the average wage of the on-the-job

workers in Zhejiang Province in the past 5 years. Combined with the scale of the disabled elderly predicted in the previous paper, the cost of care required to be spent on long-term care insurance for each year from 2020 to 2040 can be predicted.

Table 2. Cost of disability care in 2020-2040

Year	Number	Year	Number	Year	Number
2020	3.93	2027	7.78	2034	15.98
2021	4.30	2028	8.73	2035	17.54
2022	4.75	2029	9.74	2036	19.20
2023	5.26	2030	10.77	2037	20.88
2024	5.79	2031	11.95	2038	22.88
2025	6.40	2032	13.19	2039	25.13
2026	7.00	2033	14.55	2040	27.39

According to the estimation in Table 2, it can be seen that the cost of care for the disabled elderly in 2020-2040 shows a continuous rising trend, and the cost of care in 2020 is RMB 393 million, and as the scale of the disabled elderly continues to expand, the cost of care continues to increase, and the rate of increase continues to accelerate, and by 2040, the cost of care in that year reaches RMB 2.739 billion, and the accumulated cost of care is as high as RMB 26.316 billion. The huge treatment expenditure of long-term care insurance poses a great challenge to its funding mechanism.

2.3. Revenues of Long-Term Care Insurance Fund

According to the "Wenzhou long-term care insurance pilot expansion and quality implementation plan", it is clear that the long-term care insurance is paid by the employer and the individual, and the equal proportion is shared, the standard is RMB 100 per person per year. In order to reduce the burden on enterprises and individuals, the unit's contribution is transferred from the employee medical insurance premium it pays; the individual contribution can be withheld from the employee medical insurance personal account. Those who do not have a medical insurance personal account or have insufficient funds in their personal account can use their family members' personal accounts for employee medical insurance or pay by themselves in a lump sum every year; retirees will pay by themselves in a lump sum every year or choose to have their pension insurance (retirement pension) withheld and paid on their behalf. In this paper, the contribution age is set at 20-82 years old, from which the income of the long-term care fund can be calculated for the calendar years 2020-2040.

Table 3. Revenues of Long-term care fund in 2020-2040

Year	Number	Year	Number	Year	Number
2020	7.51	2027	7.64	2034	7.70
2021	7.52	2028	7.66	2035	7.68
2022	7.53	2029	7.67	2036	7.67
2023	7.55	2030	7.68	2037	7.66
2024	7.57	2031	7.69	2038	7.63
2025	7.60	2032	7.71	2039	7.58
2026	7.62	2033	7.71	2040	7.52

According to the estimation in Table 3, it can be seen that the long-term care fund income from 2020 to 2040 shows a

trend of rising and then decreasing, and the fund income can reach a maximum of RMB 770 million in 2034, and then the annual income of the fund keeps decreasing to RMB 752 million in 2040, and the accumulated fund income reaches RMB 16,009 million in 2040. As the fertility rate decreases and the labor force population further decreases, the annual revenue of the Fund will further decrease and the Fund will be under financial pressure.

2.4. Long-Term Care Insurance Fund Gape

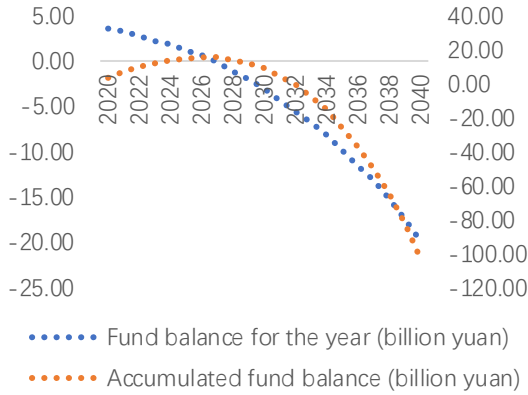


Figure 1. Long-term care fund gap in 2020-2040

The current year balance of the long-term care insurance Fund declines continuously from 2020 to 2040, and in 2027 the current year balance is in deficit for the first time and shows an expanding trend; the cumulative balance of the fund increases continuously from 2020 to 2026, with a maximum accumulation of RMB 1.545 billion, and then the cumulative balance decreases, and by 2032 the cumulative balance is in deficit and expanding, making the long-term care fund financially unsustainable and future The huge treatment expenses of long-term care insurance bring great challenges to the design of its contribution funding mechanism approach.

2.5. Long-Term Care Insurance Contribution Scheme Design

In order to design a reasonable contribution financing mechanism, this paper constructs an actuarial model to set a reasonable contribution level for the sustainable development of the long-term care fund, taking the balance of income and expenditure as the starting point.

Suppose an individual aged m starts contributing to the long-term care insurance at the beginning of the year and pays RMB A per year until the appointed time $m + k$. If the insured person becomes disabled during the contribution period, the later contributions will be waived. If a disabled person becomes disabled at the age of $m + k + 1$ and keeps in the same status every year thereafter, he/she will receive a long-term care insurance benefit of RMB B per year. r is the discounted rate, from m to $m + k$ years, the actuarial present value of the long-term care fund pool accumulation is

$$A \times \sum_{t=0}^k \frac{1_{x+t,a}}{(1+r)^t} \quad (3)$$

The actuarial present value of benefits paid to a disabled person at $m + k + 1$ age to death is the actuarial present value of

$$B \times \sum_{t+1}^{\omega} \frac{1_{x+t,b}}{(1+r)^t} \quad (4)$$

Based on the principle of actuarial balance, the amount of the participant's contribution can be calculated as follows.

$$A \times \sum_{t=0}^k \frac{1_{x+t,a}}{(1+r)^t} = B \times \sum_{t+1}^{\omega} \frac{1_{x+t,b}}{(1+r)^t} \quad (5)$$

$$A = \frac{B \times \sum_{t+1}^{\omega} \frac{1_{x+t,b}}{(1+r)^t}}{\sum_{t=0}^k \frac{1_{x+t,a}}{(1+r)^t}} \quad (6)$$

In designing the contribution scheme, following the Wenzhou long-term care insurance funding mechanism, active employees and retirees aged 20-82 are uniformly included in the long-term care insurance contribution, and the disabled elderly aged 65-82 receive a fixed monthly fee. Discount rate set at a fixed interest rate of 4%, it is estimated that to break even in 2020-2040, the long-term care insurance fund will need to increase the contributions of long-term care insurance participants to at least RMB 144/year.

If the potentially disabled population among the elderly who are unhealthy but can basically take care of themselves is taken into account, the rate of disability at all ages will increase faster, and with the deepening of social aging and further increase in life expectancy, the number of disabled elderly will increase significantly and the fund's expenditure will increase. At the same time, due to the shortage of contributors, the expenditure of the long-term care insurance fund will be larger than the income, and the trend of fund accumulation will still be decreasing.

3. Conclusion

This paper examines the financial sustainability of the long-term care insurance fund within the framework of the Wenzhou long-term care insurance system and makes the following recommendations, taking into account the experience of other long-term care insurance pilots.

First, Population growth is an important factor affecting the operation of the fund. In order to increase the future income of the fund to cope with the increasing expenses of long-term care for the disabled elderly and to reduce the burden of fund operation and financial expenditure, the government should encourage childbirth and increase the future working population to increase the income of the fund in order to ensure the stability of the fund income.

Second, in designing the contribution scheme, the long-term care insurance financing mechanism should consider establishing actuarial models for different time horizons and conducting stress tests on factors such as the cost of stage disability care and changes in the situation of the contributing population, with a view to designing a scientific and reasonable contribution scheme that can withstand certain risks while maintaining the fund can operate smoothly in the long run.

Third, the proportion of long-term care insurance treatment benefit should be considered to gradually increase. In this paper, the treatment covers people who are unhealthy and

unable to take care of themselves, but not all of them are in a state of severe disability, which can moderately reduce the care items and reduce the care expenses. In addition, there are some people whose families are more affluent and do not need to rely on the help of the long-term care system, and can fully afford it themselves. Therefore, this paper argues that the long-term care treatment mechanism can be considered to establish a gradual, stepwise approach, such as covering 40% of the cost expenditure at the beginning stage, 60% of the expenditure in about 20 years, and finally reaching 80% or even a higher level of coverage. This will help to save resources and also prioritize care for the more severely disabled group, optimizing resource allocation.

Fourth, the population covered by long-term care insurance treatment should be considered for gradual expansion. In addition to the elderly aged 65 and above who are at risk of disability, there are some young and middle-aged people under 65 who are also at risk of disability. In addition to disability, there are also people with dementia, and these two groups of people also need long-term care services. From the perspective of social equity, it is necessary to gradually include them in the scope of long-term care insurance coverage, allowing them to make full contributions and enjoy long-term care services and benefits in accordance with the system. The government should also introduce dementia rating standards as soon as possible, and make reference to internationally popular dementia scales, such as the Hasegawa Dementia Scale (HDS) or the HDS-R scale, the MMSE scale, and the BDS scale, to develop an appropriate unified dementia scale.

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