Research on Pension Demand Services in Third-tier Cities from the Perspective of Aging and Fewer Children

-- Take Suzhou City, Anhui Province, as an Example

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Abstract

With the development of society and the improvement of medical level, the trend of younger population is gradually decreasing, while the proportion of the elderly population is increasing. This increasing aging trend has brought great challenges to the urban elderly care services. In this context, how to improve the quality and efficiency of urban elderly care services has become a top priority. This paper aims to discuss and analyze the problems of Suzhou city in Anhui Province, discuss the problems existing in Suzhou city, and put forward corresponding solutions.

Keywords

Third-tier Cities; Elderly Care Services; Trend; Problems; Countermeasures.

1. Introduction

At present, most developed countries in the world are facing the challenge of aging and fewer children. Under the background of the increasing degree of aging in China, actively developing the pension service industry and improving the pension service system are regarded as an important measure to deal with the aging in China. The twenty largest report of the Party clearly put forward the goal of "implementing the national strategy of actively responding to the aging of the population, developing the pension cause and industry, optimizing the services for the elderly, and promoting the realization of the basic elderly services for all the elderly". Therefore, how to deal with the aging of the population and promote the development of pension undertakings and pension industry, these problems have become the focus of social attention and research.

1.1. Research Background

Since the beginning of this century, the rapid development of China's economic development and the great changes in the economic development mode have affected the social population structure to a certain extent. In recent years, China has stepped into the stage of accelerated aging development, and is faced with the serious problem of having fewer children. According to data released by the National Bureau of Statistics, the dependency ratio of the elderly population in China was 10.7 percent in 2005. In the following 15 years, the dependency ratio of the elderly population in China continued to grow, reaching 19.7 percent by the end of 2020. By the end of 2021, China's population aged 60 and above was about 267 million, accounting for 18.9% of the total population, exceeding the standard line of 10% of an aging society.

Aging and fewer children live together, bringing a series of challenges to the pension problem, especially for the poor elderly. Most of the elderly face large expenditures on health care due to physical degradation and reduced self-care ability, while most of them mainly rely on social security, so they are more likely to fall into poverty. With the development of social formalization, the sense of social participation of the elderly group is significantly reduced, which is more likely to cause the psychological problems of the elderly. At the same time, fewer

children has also become an important factor in the pension problem, which makes the pension problem appear multi-dimensional and complex characteristics.

According to the 2019 Health Service Statistical Bulletin released by the National Health Commission on June 6,2020, the birth rate in 2019 was 1.048, and the newborn population was about 14.65 million, a record low since the founding of the People's Republic of China. This data shows the seriousness of the problem of fewer children in China.

1.2. Research Significance

1.2.1. Theoretical Significance

This study deeply analyzes the development status and achievements of urban pension service from the micro perspective, and points out the existing shortcomings. At the same time, through the in-depth analysis of the core needs of the elderly, and combined with theoretical and empirical research, the corresponding system and strategic improvement ideas are put forward. In addition, based on the micro survey data, this paper also analyzes the core factors of the elderly care service demand from the macro and micro perspectives, and provides support for exploring the development of the elderly care service industry.

1.3. Research Problems

The research goal of this paper is to explore the influencing factors of the demand of pension service in small and medium-sized cities under the background of aging and fewer children, and put forward the countermeasures and suggestions to optimize the demand of pension service. The specific research questions can be summarized into the following three aspects:

1.3.1. Trend Analysis of the Current Situation of Aging and Fewer Children in China

This study will conduct an in-depth analysis of the phenomenon of aging and fewer children in China, and by collecting and organizing relevant data and literature, reveal the overall characteristics of demographic transformation in China, including the aggravation of aging and the development of the trend of fewer children, to provide theoretical basis and background knowledge.

1.3.2. Survey on the Status Quo of Elderly Care Services in Suzhou City, Anhui Province

Through the investigation and research of the current situation of the elderly care services in Suzhou city, including the data collection and analysis of the elderly health, community services and other aspects. By understanding the coverage degree and quality of the existing elderly care services as well as the demand and satisfaction of the elderly, we can comprehensively understand the current situation of the elderly care services in Suzhou's city, so as to provide a basis for the follow-up problem analysis and countermeasures.

1.3.3. Countermeasures of Fourth-tier Cities to the Trend of Aging and Fewer Children

Based on the analysis of the current situation of elderly care services in Suzhou, this study will focus on the strategies of third-tier cities in coping with the trend of aging and fewer children. Through in-depth study and analysis of the current measures of elderly service policy, institution construction, community participation, targeted countermeasures and suggestions are put forward to optimize the satisfaction of the needs of elderly service and improve the quality of life of the elderly.

2. Literature Review

2.1. Status Quo of Foreign Research

Foreign research on the elderly urban pension service is relatively perfect, many scholars on the elderly pension research, content extended to national medical, social development, mental health, and other areas, Conroe, Simon and Thomas, Matt geriatric medicine research, he thinks,

need to be in the whole hospital to provide comprehensive geriatric evaluation, combined with specific clinical ability, for the elderly to provide more community-based medical services. Ca, C hey-Lye and Lee, June May-Ling examined the relationship of well-being and all-cause mortality in older adults and concluded that activities, policies and programs to maintain or enhance well-being may benefit longevity in older adults.

Tameka, Diana G in 2012 to improve the survival rate of the elderly, the measurement of physical function is considered to estimate the effective objective clinical tool of the elderly survival rate, through the study of the elderly pace of the association and survival rate, he thinks that gait speed and survival rate has a positive correlation, by reducing the daily life tool activity disorders and improve the step speed can achieve the elderly survival rate and physical quality.

Jansen, Elisabeth suggests that when caring for the elderly, it is important to consider their experience of the sense of life, and focus on maintaining the source of significance in life, which has important reference value for improving the pension quality of the elderly.

From the development trend of foreign and research status, developed countries pension model is relatively mature, there are generally multiple successful operation of the medical security system and the successful application of medical service system, and in geriatric medicine research, solve the aging, less special aging problems have accumulated a lot of mature experience, formed the national conditions of improve the efficiency of individual labor force, strengthen the operation mode of aging care, these experience is worth our country learning, reference and adoption.

2.2. Domestic Research Status and Development Trend

Domestic scholars have conducted various research and analysis on the pension problems of the elderly in China. In terms of the definition of the national pension policy, Aid Yuri, Ian Chi net and others have analyzed the characteristic policies for place and person. They believe that the government should pay attention to the negative impact of aging when formulating innovation incentive policies, and formulate corresponding policies for different regions.

Li Jingly and Chi Hangmen elaborated on the rationality of formulating characteristic pension policies from many aspects in 2023. They believe that the Central Plains urban agglomeration should cope with the increasingly prominent problem of population aging by increasing the natural population growth rate, promoting social and economic development, and building a perfect old-age service system and old-age security system.

Song Slaying, Fao Changchun etc of endowment insurance spending and the difference between high quality Chinese economic development and connection, on the one hand, the aging population suppresses the economic development, on the other hand, the endowment insurance spending is to promote the economic development of high quality, in terms of economic development, further improve the endowment insurance spending system, promote the fund balance, realize regional endowment insurance spending and economic inclusive coordinated development.

From the point of the current development of our country, urban pension process development is slow, dealing with the aging, less children theory research is mainly confined to the current is implementing the pension policy, to improve the quality of life of old people living alone and solve the problem of labor shortage of children less research, for three line city pension demand service perfect, healthy aging research less.

2.3. Literature Review

The research of special urban pension service with aging and fewer children is a problem that cannot be ignored under the historical conditions of China's economic development. The study of aging is not only of great significance to the development of social aging undertakings in China, but also has a profound impact on families and individuals. On how to establish and

improve the urban pension problem of the elderly in the special era environment, scholars have made a detailed analysis from the perspective of law, society and medical treatment.

According to the data collected from this topic at present, although many scholars have carried out many studies on the urban pension problem of the elderly, there are still some shortcomings and shortcomings in these studies. Therefore, this paper takes Suzhou city in Anhui Province as an example to explore a new pension model in third-tier cities under the condition of aging and fewer children.

3. The Trend of Aging and Fewer Children and its Impact on Pension Demand

3.1. Concept Definition

Aging refers to the increase in the proportion of the middle-aged and the elderly and the age distribution of the elderly population. Usually, the population aged 65 years and older is defined as an elderly population based on age division and demographic data. The degree of aging can be measured by the proportion of the elderly population in the total population. Here, to facilitate our presentation of this phenomenon, we define aging as the proportion of the population over 65 years old in more than 10% of the total population.

From the figure above, the number of people over 65 years old in China is increasing and showing a gradual upward trend, which gradually reflects the characteristics of aging after 2017. In addition, the proportion of infant population in China in the past 60 years has also been decreasing and showing a downward trend. At present, it accounts for less than 20% of the total population, and the young population in the middle section fluctuates around 60%~70%.

Less children refers to the phenomenon that the declining fertility rate leads to a decrease in the number of newborns and the proportion of the child population. Generally, fewer children can be defined according to the fertility rate index, and just as in the definition of aging, when we put the total fertility rate below 2 (population replacement level), it can be considered as the phenomenon of fewer children. As shown in Figure 2, we counted the fertility rate in China in the past 60 years. According to the data in the figure, China has entered the stage of fewer children since 1992, and the fertility rate has fluctuated around 1.5 in the past two decades. Moreover, it can be fully observed in the figure that the fertility rate in China has an obvious downward trend from 1970 to 1990.

For aging and less characteristics associated with a variety of factors, we use the age structure and fertility is only the most directly reflect the characteristics of the variables, trend they are related to other factors, such as social economy, culture, national policy, etc., for the two characteristics we will be a further study.

3.2. Trend Analysis

According to the characteristics of China's population aging and children in the past 60 years, we will conduct time series analysis and use statistical models to predict the future trend of aging and fewer children. The specific modeling process is shown in the following flow chart:
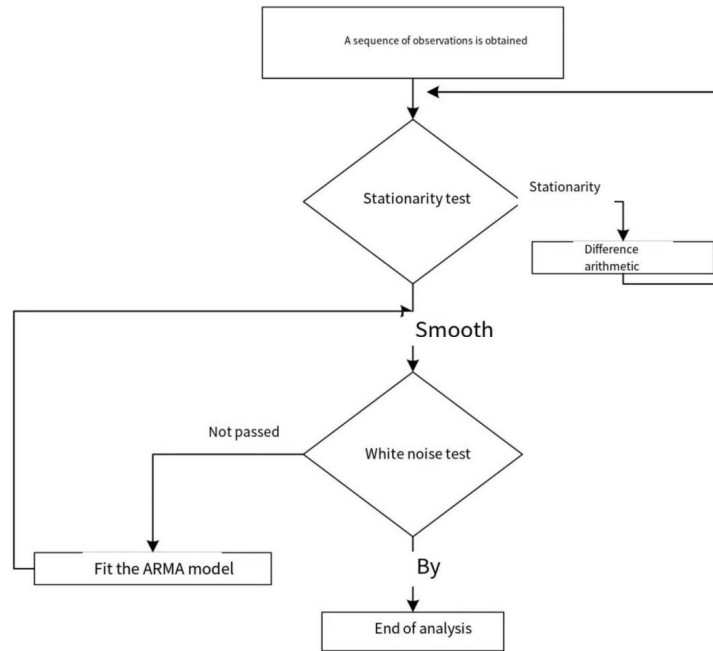
Figure 1. Flow chart of ARIMA model modeling

According to the obtained data, the data of aging and fewer children have an obvious linear trend of rising and decline, respectively, which are typical non-stationary sequence characteristics. After the beginning of the first order difference of the sequence, the model still has a clear linear trend of change, so we obtained the second order difference after the difference between the aging feature and the minority character. Figure 4 shows that the second order difference sequence value basically fluctuates around a certain value, with no obvious trend feature.

In order to further determine the nationality of the differential sequences, the ADF test is conducted on the differential sequences. In order to make the model as simple as possible, the time series model established below is an ARIMA model without offset term and trend term. The test results are shown in Table 1 below:

Table 1. ADF nationality test without drift items and trend items

	Characteristic sequence of aging		Daughter characteristic sequences	
Number of lag periods	The ADF statistics values	P price	The ADF statistics values	P price
2	-5.24	<0.01***	-5.67	<0.01***
3	-4.40	<0.01***	-4.44	<0.01***
4	-4.34	<0.01***	-4.73	<0.01***

p *** <0.01.

$P\ \alpha = 0.05$ According to the results of the ADF nationality test, the value of the test statistic is less than the significance level (), so it can be considered that the sequence achieves the stability after the second order difference. The sequence is tested for pure randomness, and the results are shown in Table 2 below:

Table 2. Pure randomness test

Delay order	Characteristic sequence of aging		Daughter characteristic sequences	
	LB statistic value	P price	LB statistic value	P price
6	3.6611	0.7224	125.58	<0.01***
12	4.0577	0.9824	218.42	<0.01***

p *** <0.01.

$^{P\,P}$According to the results of pure random test, the value of the LB statistics is greater than the significance level, and the value of the LB statistics is less than the significance level, which shows that the sequence after the difference is the smooth white noise sequence, the latter is the smooth non-white noise sequence. First of all, we can determine the expression of the model estimate after the differential sequence of aging features (where the delay operator, and the latter are expressed as the delay operator):$^{B\,B}$

$$(1-B)^2 x_t = \varepsilon_t \tag{1}$$

To further estimate the expression of the sequence model after the less daughter features, consider the auto correlation diagram after the second order difference sequence, see Figure 2 below:
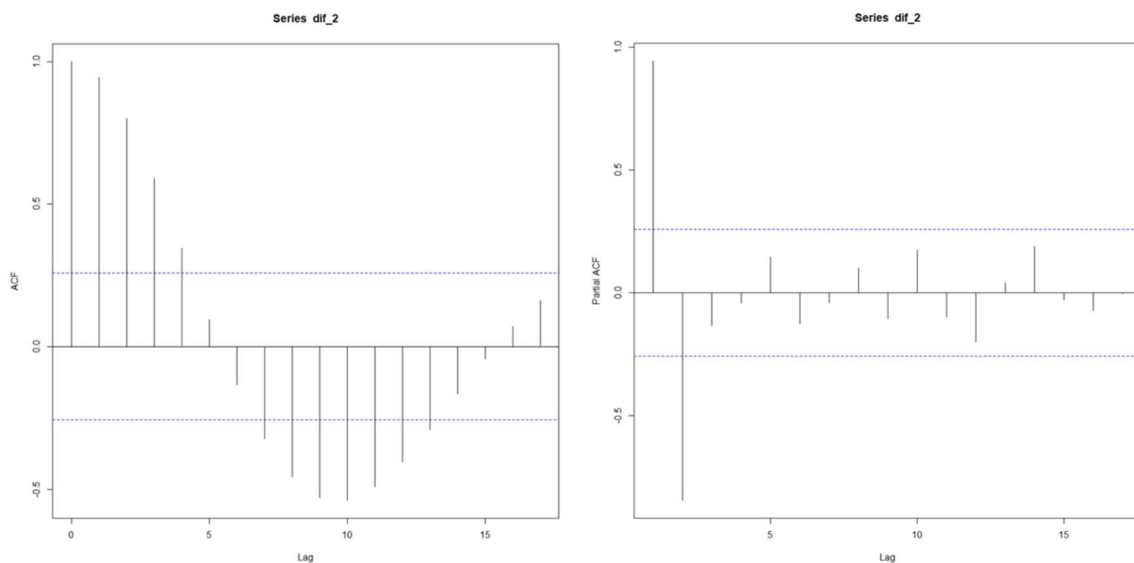

Figure 2. auto correlation and partial auto correlation after the second-order differential sequence of less-daughter features

According to the graph, the auto correlation graph shows the trailing features, and the partial auto correlation graph shows the second-order censoring features, and all the considered models fit the second-order differential sequence with the AR (2) model. In summary, we can determine that the less daughter feature sequence can be fitted with the APIMA (2,2,0) model, and the estimated expression is:

$$(1-\Phi_1 B-\Phi_2 B^2)(1-B)^2 x_t = \varepsilon_t \tag{2}$$

Through the constructed model (1) and model (2), we fit the estimation of the aging characteristics and the trend of less child characteristics respectively, and use the conditional least squares estimation and maximum likelihood estimation to obtain the estimate of the model parameters.

ε_t For the estimation of the parameters of the model (1), the estimated variance of the current period is 0.003067, and the log-maximum likelihood function value of the model is 88.47. For model (2), the estimated variance is, and the log-likelihood function of the model is 227.82. The estimation and significance of the model (2) auto regressive parameters are shown in Table 3 below:$\varepsilon_t 2.054 \times 10^{-5}$.

Table 3. Model (2) Estimation and significance of the auto regressive parameters

	Φ_1	Φ_2
Parameter estimates	1.8057	-0.9096
standard error	0.0483	0.0472
P price	<0.01***	<0.01***

p *** <0.01.

According to the above table, the estimation of the auto regressive parameter of the model (2) is significant, that is, the estimated model expression is:

$$(1 - 1.8057B + 0.9096B^2)(1 - B)^2 x_t = \varepsilon_t \qquad (3)$$

According to the fitted model, we compare the estimated values with the true data values in Figure 3 below:
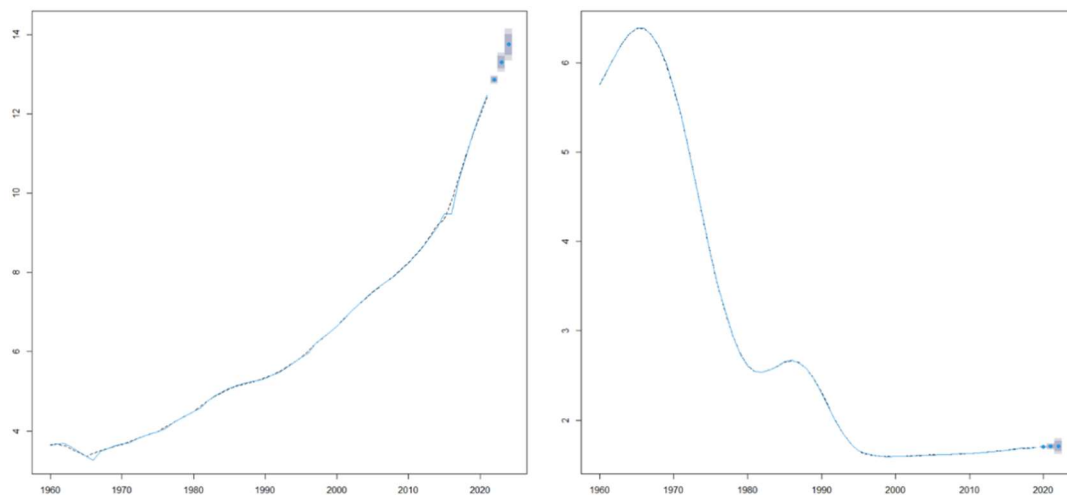

Figure 3. Fitting and prediction effect of aging characteristics and fewer characteristics

According to the content in the figure, the error between the good fitting effect and the real value is very small. The predicted values of the aging age structure ratio in the next three periods are: 12.8581%, 13.3030% and 13.7479%. It can be seen that the characteristics of aging in China will not slow down in the future, and the future trend shows an upward trend. The predicted values of the fertility rate in the next three phases are: 1.701104,1.705500 and 1.709431. It can be seen that the fertility rate of women in China is increasing slowly but still

presents the characteristics of fewer children. It may take more time for the fewer fertility characteristics to appear in the future.

4. Conclusion

Aging and having fewer children are one of the important challenges facing today's society. These two trends have put forward new challenges and opportunities for the demand for elderly care services. Taking Suzhou city, Anhui Province, China as an example, this paper deeply studies the elderly care demand services in this region to explore how to deal with the challenges brought by aging and fewer children.

Firstly, this paper analyzes the population structure and trend of Suzhou city. According to the data, the proportion of the elderly population in Suzhou is increasing year by year, and the fertility rate is decreasing, showing a dual trend of aging and fewer children. This will have a profound impact on the demand for elderly care services, which requires the joint response of the government, social institutions and enterprises.

Secondly, this paper evaluates the existing pension service system in Suzhou city. The study found that although Suzhou has established a certain old-age service system, the service supply is still insufficient compared with the aging degree. Insufficient beds in nursing homes, insufficient nursing staff, community pension services are not perfect, and the needs of the elderly have not been fully met.

Finally, this paper summarizes the main findings and policy recommendations of the study. Aging and having fewer children are global problems that require the joint efforts of governments, social institutions and enterprises to meet the pension needs of the elderly. Through the study of Suzhou city as an example, this paper hopes to provide useful reference and experience for other areas coping with the trend of aging and fewer children. The elderly are a valuable resource for society, and providing high-quality elderly care services is not only a respect for them, but also the responsibility of society.

Acknowledgments

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