Study on the Fairness of Distribution of Institutional Pension Resources in China

Lian HAO¹, Sheng LI²,* and Fang XIANG¹

¹School of Management, Chengdu University of TCM, Chengdu, China
²Center for Health Policy and Drug Operation Management, Chengdu University of TCM, Chengdu, China

*Correspondence author

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Abstract. To optimize the allocation of institutional pension resources, we use the Gini coefficient and the Theil index to analyze the fairness of the allocation of institutional pension resources at 2016 in China. It is found that the resources of the nursing caregivers are lacking, and their allocation is highly unfair; the institutional-style old-age resources are more equitable in terms of population distribution than geographical distribution; intra-regional differences are the main reason for unfair allocation, especially in the western regions. To overcome these shortcomings, several countermeasures are provided. Firstly, multiple measures should be taken to ensure the supply of resources for the elderly. Secondly, we can combine home care with community pension to solve the distance problem. Finally, it is necessary to dynamically adjust the supply according to the needs of the elderly, and break the "dual-track system" of pension policy.

Introduction

The data from 2017 China Statistical Yearbook shows that the population aged 60 and over account for 16.7%, and the population aged 65 and over account for 10.8% in 2016. Moreover, the disabled and half-disabled elderly people are more than 40 million. Special populations such as empty nest, living alone, and losing independence have increased rapidly, and aging is showing regional differences. The family pension function weakened by the family planning policy¹, making the family pension model in China will transform into the social pension model². While the old-age institutions as an important component and foundation support in the social pension service system³, it has an indispensable role and value for taking on the burden of old-age care in China.

However, at this stage, the problems of insufficient supply and imbalance of institutional old-age resources are prominent⁴. Another study shows that China's old-age beds are in a state of "one bed is hard to find" and the bed is idle⁵. In order to improve the capacity of old-age services and alleviate the pressure of social pensions, relevant government departments such as the State Council and the Ministry of Civil Affairs have successively issued policies to encourage the increase of aged care services and products.

Understanding the current status and fairness of the allocation of institutional pension resources in population and geographic area is a prerequisite for optimizing institutional pension resources. Tao (2015) used the number of old-age care institutions and the number of old-age beds as institutional pension facilities resources when calculating the accessibility of the elderly population to the old-age facilities in Beijing⁶. The old-age caregiver is an important human resource for providing aged care services in the old-age care institutions. Therefore, we select the number of old-age care institutions, nursing caregiver and pension beds as institutional pension resources.
Sources and Methods

Data Sources

Aged institutions, nursing caregiver and pension beds in each province are used as indicators of institutional pension resources. The three kinds of data and the ageing population data are all sourced from the 2017 China Civil Affairs Statistical Yearbook. The geographic area data is derived from the 2017 China Statistical Yearbook. And the division of China’s eastern, central and western regions is derived from the 2017 China Health and Family Planning Statistical Yearbook.

Method

The relevant data was entered, collated and statistically analyzed by using SPSS19.0, and the Gini coefficient and the Theil index were used to analyze the fairness of institutional pension resources in terms of population and geographical allocation.

Gini Coefficient. It’s an indicator commonly used to reflect the fairness of resource allocation. According to international practice, it is generally considered that the Gini coefficient is below 0.3 for the best average state, 0.3 to 0.4 is the normal state, and above 0.4 is the warning state, and reaching 0.6 or more is the highly unfair state\(^7\). Calculated as follows:

\[
G = \frac{1}{2} \sum_{i=1}^{n} Y_i W_i + \sum_{i=1}^{n} W_i (1 - V_i) - 1
\]

Theil index. It can reflect the differences between groups and groups, analyze the source of unfairness. Moreover, since the Gini coefficient is not sensitive to changes in the proportion of resources with a small per capita resource possession, the Theil L index is chosen to make up for its shortcomings\(^8\). Calculated as follows:

\[
T_c = \sum_{g=1}^{k} P_g T_g
\]

\[
T_a = \sum_{g=1}^{k} P_g \log \frac{P_g}{Y_g}
\]

\[
T = \sum_{i=1}^{n} P_i \log \frac{P_i}{Y_i}
\]

Results

Overview of National Institutional Pension Resources Allocation

From the perspective of the total amount of institutional pension resources in China, there were 28,592 old-age care institutions, and 3,787,751 pension beds in 2016, and a total of 27,809 qualified elderly care workers in all provinces across the country. By region, the three institutional pension resources are both decreasing from the east to the central and western regions. Institutional pension resources according to the allocation of resources per 10,000 elderly people, the number of pension institutions in the central region is the highest, at 1.4; in the western region, the number of elderly care workers is the highest, at 1.5. In the eastern region, the number of old-age beds is the highest, at 165.2. The provinces have a large difference in the amount of resources per 10,000 elderly people. For example, the number of elderly care institutions per 10,000 elderly people in Jilin is 2.3, while the Tibet is only 0.3. According to the configuration of institutional pension resources, the number of these three resources are decreasing from the eastern region to the central region and then to the western region. Shanghai’s pension institutions and pension bed resources are the highest in terms of geographical allocation, and the old-age care workers in Guangdong have the highest allocation. The three resources in the Tibet are both at the lowest level in terms of geographical allocation.
Gini Coefficient of Institutional Pension Resources

The Gini coefficient of the institutional pension resources allocation calculated by the formula is shown in Table 1. According to the configuration of the elderly population, the Gini coefficient of the national pension institutions, nursing caregivers and pension beds is 0.18, 0.55, and 0.22. The caregiver is highly unfair. The fairness of the population allocation in the eastern, central and western regions is also poor. In terms of geographical allocation, the Gini coefficient of the national pension institutions, pensioners and pension beds is 0.68, 0.75, and 0.71. The fairness of the allocation of the three resources is highly unfair. The old-age institution is generally fair in the east, and the Gini coefficient of pensioners and pension beds beyond the warning line and the fairness is poor. The pension institutions and old-age beds in the central region are relatively fair, and the elderly care workers are highly unfair. The three resource allocations in the western region are highly unfair.

Table 1. Gini coefficient of institutionalized pension resources allocation in China in 2016.

<table>
<thead>
<tr>
<th>area</th>
<th>Configure by population</th>
<th>Configured by geographic area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pension agency</td>
<td>nursing caregiver</td>
</tr>
<tr>
<td>national</td>
<td>0.18</td>
<td>0.55</td>
</tr>
<tr>
<td>eastern</td>
<td>0.13</td>
<td>0.58</td>
</tr>
<tr>
<td>central</td>
<td>0.19</td>
<td>0.56</td>
</tr>
<tr>
<td>western</td>
<td>0.21</td>
<td>0.43</td>
</tr>
</tbody>
</table>

The Theil Index of National Institutional Pension Resources

By using the calculation formula, the total Theil index, the inter-group and intra-group indices and their contribution rates of the three resources allocations are calculated, as shown in Table 2 and Table 3. The total Theil index of various institutional pension resources indicators is the same as the fairness reflected by the Gini coefficient calculated. It’s that the fairness of the pension institutions is better than that of the old-age beds, which is better than the nursing caregiver. The contribution rate of the pension institution, nursing caregiver and old-age beds in China is 91.9%, 97.7%, and 83.6%, which are both significantly greater than the contribution rate between the groups, indicating that the regional differences caused the unfairness of institutional-type pension resources in China. There is a big difference in the fairness of inter-institutional institutional pension resources allocation. The fairness of the elderly care workers in the eastern region is the worst, and the fairness of the pension institutions and old-age beds are the highest; the fairness of the three resources in the central region are in the middle level; the pension institutions and pension beds in the western region have the lowest level of fairness, and the nursing caregiver have the highest fairness.

Table 2. 2016 National Institutional Pension Resources and the Theil Index and Contribution Rate.

<table>
<thead>
<tr>
<th>index</th>
<th>Theil General Index</th>
<th>Inter-group index</th>
<th>Contribution rate between groups/%</th>
<th>Intra-group index</th>
<th>Intra-group contribution rate/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>pension agency</td>
<td>0.0249</td>
<td>0.002</td>
<td>8.10%</td>
<td>0.0229</td>
<td>91.90%</td>
</tr>
<tr>
<td>nursing caregiver</td>
<td>0.2986</td>
<td>0.0069</td>
<td>2.30%</td>
<td>0.2918</td>
<td>97.70%</td>
</tr>
<tr>
<td>pension bed</td>
<td>0.0365</td>
<td>0.006</td>
<td>16.40%</td>
<td>0.0305</td>
<td>83.60%</td>
</tr>
</tbody>
</table>

Table 3. The Theil Index and Contribution Rate of Institutional Pension Resources Allocation in Different Regions in 2016.

<table>
<thead>
<tr>
<th>index</th>
<th>eastern</th>
<th>central</th>
<th>western</th>
</tr>
</thead>
<tbody>
<tr>
<td>pension agency</td>
<td>0.0137</td>
<td>0.0255</td>
<td>0.0339</td>
</tr>
<tr>
<td>nursing caregiver</td>
<td>0.3303</td>
<td>0.3295</td>
<td>0.192</td>
</tr>
<tr>
<td>pension bed</td>
<td>0.022</td>
<td>0.0323</td>
<td>0.0415</td>
</tr>
</tbody>
</table>
Discussions

The Total Amount of Resources for the Aged Caregiver is Insufficient and the Allocation is Highly Unfair

In 2016, the total number of qualified elderly nursing staff was 27,809, and the number of nursing caregiver per 10,000 elderly people was only 1.2, and the number of elderly nursing staff per 10,000 square kilometers was only 29.9, indicating the total amount of elderly care workers in China is seriously insufficient. The Gini coefficient of the aged care staff according to the population allocation and the geographical area is above 0.5, which is in a highly unfair state. Furthermore, the number of qualified people hasn’t been able to solve the professional needs of pension services. Because the international care ratio is 1:3, based on the calculation of about 40 million disabled elderly people in China, the number of nursing caregiver should reach more than 10 million to meet international standards.

Multiple measures should be taken to ensure the supply of resources for the elderly. The combination of medical care and health is the trend of future development. Through the cooperation between the pension institutions and the hospitals, the medical care and human resources are shared to achieve mutual benefit and win-win. Or open a green channel for the training of nursing caregiver, attract rural employees, unemployed people and other hard-to-employees to participate in the training of old-age care workers, and then let them engage in the pension service industry. In addition, improving remuneration packages, balancing social security levels, and optimizing development prospects are important ways to address the shortage of endowment care workers.

Institutional Pension Resources Are Better in Demographic Allocation than in Geographical Configuration

The Gini coefficient of the pension institutions and the old-age beds in the population allocation are both less than 0.3, which are in a relatively fair state; the Gini coefficient of the nursing caregiver in demographic allocation is greater than 0.5, which is a highly unfair state. The Gini coefficients of the three resources are all above 0.6 in geographical configuration. It can be seen that China's institutional pension resources are generally better in demographic allocation than in geographical configuration. The government or the market mostly considers the population, the economy and other factors to allocate resources, and less considers the allocation according to the geographical area, which will lead to inconvenience or reluctance of the elderly to the old-age institutions.

Combining with home care or community pension can solve the problem. When the government allocates pension resources, it follows the maximization of utility. Home-based care is still the mainstream pension system. When the elderly put forward the need for the elderly service center through smart devices such as mobile phones and bracelets, there will be nursing caregiver providing on-site services. Community pension is an intermediate mode between home pension and institutional pension. The elderly care workers are served by the community through the recruitment of the community or the pension institutions. The institutions don’t have to provide the beds of the places, and the elderly don’t have to stay away from the family. In this way, it’s possible to effectively solve the problem.

Unfair Allocation of Institutional Pension Resources is Mainly Reflected in Regional Differences, and the Fairness of the Western Region is the Worst

The contribution rate of the three resources in 2016 is greater than 80%, which indicates that the intra-regional difference is the main reason for unfairness. This may be related to the difference in economic development level and the population. For example, Sichuan and Tibet belong to the western region. Sichuan has far more resources than Tibet, but its per capita possession is less than Tibet. From the perspective of the regional Theil index and its contribution rate, the allocation of the resources in the eastern region is the best, followed by the central region and the western region. For example, the highest and lowest ratio of the number of elderly people in each province's pension institutions and nursing caregivers is 3.4, 51.1 in the eastern region, 2.8 and 27.4 in the central region,
and 5.5 and 64.7 in the western region. It can be seen that the gap in resource ownership is wide and unfair.

Dynamic adjustment of supply according to the needs of the elderly, while breaking the "dual track system" of pension policies may solve these problems. On one hand, when the supply exceeds demand, there will be idle beds. They can be rented at low prices to the elderly service volunteers whose economic ability isn’t enough to bear the high housing prices. Through their volunteer service, they can not only alleviate the problem of nursing gap and medical shortage, but also make the elderly happy. On the other hand, when the supply exceeds demand, the new pension institutions are time-consuming and labor-intensive, and it’s difficult to meet the short-term pension needs. Therefore, it is possible to organize an aged care service institution by transforming and utilizing idle enterprises, schools, and the like. In addition, give full play to the positioning of public pension institutions “guarantee basic and bottom line”, and give priority to ensuring the needs of special elderly people. The relevant government departments should also break the “dual system” of pension policies, and encourage social forces to set up old-age institutions through policies and finances. Meet the multi-level and diversified needs of the elderly through market allocation.

Conclusions

To sum up, the government should focus on the lack of old-age caregivers, the accessibility of old-age resources, and the old-age security of special elderly groups in formulating the development strategy of pension service institutions. At the same time, the government should work to resolve the problem of unbalanced resource allocation in the pension institutions and reduce unfairness between regions and regions. Fair and accessible, high-quality and diverse elderly services should be really provided for the growing number of elderly people in China.

References

