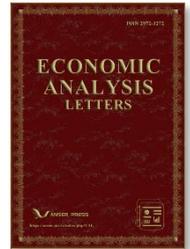




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Existing Population Aging Rate may no longer be a Good Statistical Indicator

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ABSTRACT

In the statistical standard of population aging adopted by the United Nations in 1956, the UN only focused on age, which is no longer a good statistical indicator in the context of deepening global population aging. To some extent, population aging is also the embodiment of social progress. This paper suggests improving the existing statistical standards of population aging to better adapt to the reality of social development.

KEYWORDS

Population aging; Statistical standard; Social development

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1. Introduction

Population aging refers to the dynamic process of the growth of the proportion of the elderly population in the total population of a region, and the aging society is a state. According to the criteria set by the United Nations in 1956 in *Population Ageing and Its Socio-economic Consequences*, if the proportion of people aged 60 and above in a region exceeds 10% or the proportion of people aged 65 and above exceeds 7%, it is considered to have entered an aging society (Heo, 2022).

In the United Nations statistical standards on population aging, only the dimension of population age is concerned. The population over a certain number of years (60 or 65 years old) is separated from the statistical scope of the working population and included in the list of dependent people. Generally, the ratio of the elderly population to the working population is called the elderly dependency ratio to indicate the corresponding pension burden for every 100 workers. The high proportion of the aging population is something other than an expected result. After all, it means that more people receive pensions rather than create social wealth. Therefore, the phenomenon of population aging has been closely watched by economists and sociologists. We often hear that some countries with a low aging population are regarded as promising because that means a large number of labor reserves (Emerson and Knabb, 2020; Higo, 2022).

In recent years, the problem of population aging has become prominent, causing widespread concern. According to the data bulletin of the Seventh National Population Census, which took effect on November 1, 2020, as the standard statistical time point, the population aged 65 and above in China was 190.64 million, accounting for 13.50%, and its proportion in the total population increased by 4.63 percentage points compared with 2010. In China, there are 30 provinces where the proportion of the elderly aged 65 and above exceeds 7% and 12 provinces where the proportion of the elderly aged 65 and above exceeds 14%. According to the census data and the relevant standards of the United Nations, China has entered an aging society. The aging of China's population has once again aroused widespread concern and concern in the world. For the world's largest population country, the world's largest manufacturing country, and the world's largest trading country, the problems related to the aging of the population, such as labor shortage, aging before getting rich, and increasing social security pressure, have once again been put in front of policymakers and the public. The aging of China's population also affects whether the whole world can continue to enjoy low-cost trade goods. After all, China has provided the world with a large number of high-quality and inexpensive goods with a large number of cheap labor since the late 1970s, which has become the secret of a better era when residents of the United States and other countries enjoy rising incomes while prices remain unchanged (Ye et al., 2022).

However, the aging rate is no longer a good statistical indicator. The obvious limitations of this indicator should not be ignored, and the statistical scheme of the aging rate should be improved.

2. Population aging is the embodiment of social progress

According to the demographic theory, social progress has led to the extension of life expectancy and the decline of fertility, which together promote the transformation of the population growth model, thus leading to the population aging. With the progress of society, the income level of residents has increased, which can ensure adequate nutrition and more income can be used for medical expenditure, so the life expectancy has continued to grow. Meanwhile, social progress has also improved women's education level and labor force participation rate. At the same time, it has also increased the opportunity cost for women to have children and the cost of child-rearing, ultimately leading to a decline in women's willingness to have children and a reduction in the birth rate. Population aging refers to the proportion of the population aged 60 or above in the total population. The extension of life expectancy and the decline of the population birth rate will increase the population aging rate.

This phenomenon can be well illustrated using national data in the World Bank database as an example. In 1960, the proportion of the population aged 65 and above in Brazil, China, Germany, Egypt, France, Britain, India, and the United States was 3.15%, 3.69%, 11.47%, 3.80%, 11.65%, 11.77%, 3.05%, and 9.12% respectively. Among them, the average proportion of people over 65 years old in the total population of four developing countries, Brazil, China, Egypt, and India, is 3.42%. In comparison, the simple average proportion of people over 65 years old in four developed countries, Germany, France, Britain, and the United States, is 11.00%. By 2021, the proportion of the population aged 65 and above in Brazil, China, Germany, Egypt, France, Britain, India, and the United States will be 9.94%, 12.41%, 21.98%, 5.43%, 21.09%, 18.85%, 6.78%, and 17.04% respectively (Figure 1). Among them, the simple average proportion of people over 65 years old in the total population of four developing countries, including Brazil, China, Egypt, and India, is 8.64%. The simple average proportion of people over 65 years old in four developed countries, including Germany, France, the United Kingdom, and the United States, is 19.74%. It can be seen that from 1960 to 2021, the population aging rate of all countries, whether developed or developing, will increase. Indeed, in 2021, the proportion of people over 65 in the total population will be 9.54%, exceeding the 7% aging social standard. Our world has entered an aging world.

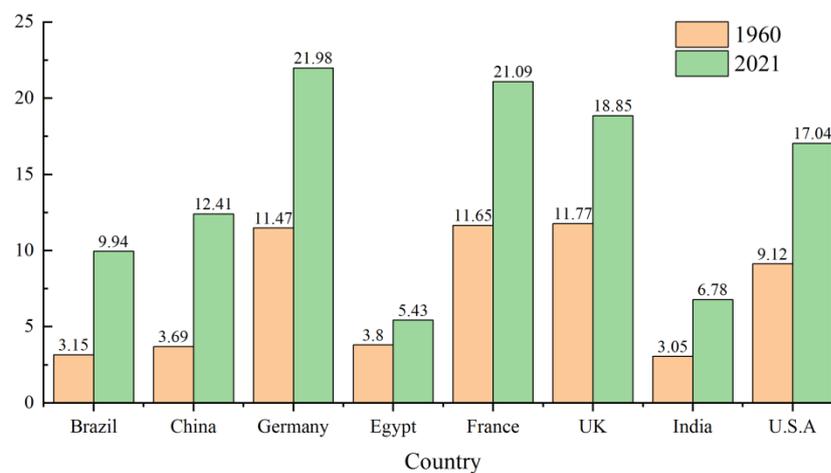


Figure 1. Population aging in major countries.

It can be said that population aging is an important symbol of social development and progress. The public data of the World Bank in 2021 supports this conclusion: the proportion of the population aged 65 and above in low-income countries, low- and middle-income countries, middle-income countries, middle- and high-income countries, and high-income countries is 3.26%, 7.76%, 8.30%, 11.40%, and 18.98%, respectively. It can be seen that population aging is highly synchronized with the process of social development. From the examples of the four developing and developed countries, we can also see a similar conclusion. Firstly, the population aging in all eight countries is increasing, which shows that all countries are developing and progressing. Secondly, the population aging rate of the four developed countries is always significantly higher than that of the four developing countries, indicating that the development level of the four advanced countries is always higher than that of the developing countries. Perhaps we can think that China has become more developed than Egypt in 2021 when the proportion of people over 65 years old (12.41%) will exceed Egypt (5.43%). However, the ratio of population aging in the two countries was almost close to 60 years ago (in fact, Egypt's figure was slightly higher than that of China).

3. Existing statistical standards for population aging have limitations

The existing analysis scheme seems conducive to international and cross-period statistical comparability. Still,

there are apparent limitations: first, it only pays attention to the population size of each age group rather than the population quality and does not consider the education level, work experience, health level, and other essential labor characteristics of the corresponding labor force population or the elderly population. Second, the dynamic adjustment of statistical caliber with technological progress and improvement of population quality was not considered. Third, the relevant analysis did not view the on-the-job status of the corresponding labor force population and the elderly population, let alone the unique quality of unpaid housework (Fukuda and Okumura, 2021).

In recent years, economic and social development has dramatically changed the social organization model. The limitations of the analysis on population aging and social dependency ratio have been further highlighted, and the gap between the relevant analysis conclusions and social reality has also widened significantly.

First, the progress of science and technology has brought about the extensive application of mechanization and automation. The requirements of general social work on physical labor intensity have been greatly reduced, and the restrictions of social work on the age of the population have been greatly reduced. At the same time, the gaps in mechanization, automation, and intelligence in countries with different levels of development cannot be reflected in the statistics of population aging and thus lose comparability.

Second, the general improvement in education level and the deepening of labor specialization have further enhanced the human resource reserve value of the population, especially the elderly. Many retirees are currently re-employed in medical, education, scientific research, management, and other fields, and there is an employment problem for the elderly. The fact that re-employment and other phenomena widely exist under the market economy system reflects the role of employment experience in human capital addition and the limitations of existing population aging statistics and elderly dependency ratio analysis indicators. With the improvement of mechanization and artificial intelligence, the proportion of posts dominated by manual labor has decreased, the age limit on the working population has decreased, and the impact of population aging on industrial production and enterprise operation has also decreased.

Third, the progress in medical care has brought about the extension of life expectancy and the improvement of population quality. The suitable working years of the population have been greatly improved. Delayed retirement has become the norm in developed countries. The legal retirement age in some countries has exceeded 60 or even 65 years old. World Health Organization calls the elderly aged 60 to 69 the young elderly and believes they are an essential labor supplement in an aging society. Japan has extended the statutory retirement age to 65 years old and introduced the Law on Correcting the Employment Safety of Older Persons in April 2021, delaying the maximum retirement age to 70. It is not appropriate to distinguish the working population from the elderly according to the original standard of 60 or 65.

Fourth, the improvement of urbanization level has brought about an increase in women's social labor participation rate and the proportion of elderly family members who bear family care. Although unpaid housework is not included in GDP in the national economic accounting, and the elderly who bear the responsibility of family care cannot be included in the employment category, related activities do not only help improve the quality of family life but also reduce the time occupation of other family members, objectively improving the social labor participation rate and labor supply, especially for women's social labor participation rate.

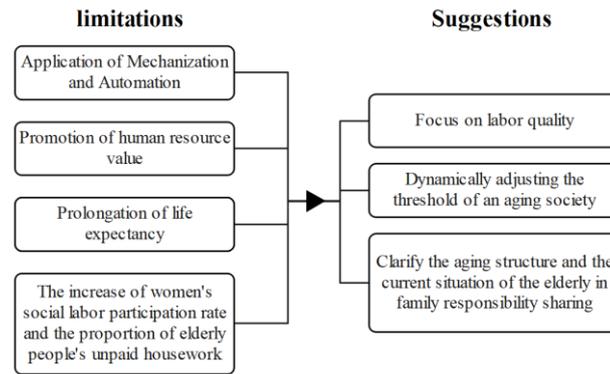


Figure 2. Limitations and suggestions on the existing statistics of population aging.

4. Conclusion and suggestions

Given the limitations of the existing population aging statistics program, the existing population aging rate is no longer a good statistical indicator. It is necessary to explore measures to improve the corresponding statistical indicators.

First, since the current population aging statistics only focus on age indicators and quantity indicators and do not consider the limitations of population health status, population employment status, population education level, and skill level, it is necessary to pay more attention to the labor quality in the indicator calculation process and explore the weighted treatment of labor force according to health level and skill level to reflect the difference of (elderly) labor force quality. We can make targeted statistics on the weighted and adjusted population aging rate indicators based on retaining the existing population aging rate indicators.

Second, since the existing standards for population aging remain unchanged and cannot adapt to the reality of social development, we can consider dynamically adjusting the division standards for the working population and the elderly. In 1956, the United Nations stipulated the criteria for population aging in the United Nations Population Ageing and Its Socio-economic Consequences, setting an aging society when the proportion of people aged 60 and above in a region exceeds 10% or the balance of people aged 65 and above exceeds 7%. At this time, the global population aging standard is low. According to data from the World Bank, in 1960, the proportion of people over 65 years old in all countries in the world was only 4.97% of the total population. In 2021, the figure will increase to 9.54%, doubling the proportion of the aging global population. The original standard can be adjusted when the aging of the global population has become a trend and the proportion of the population over 65 years old is close to 10%. A simple adjustment plan is to double the original standard. That is, the proportion of the population aged 60 and above in a region exceeds 20%, or the proportion of the population aged 65 and above exceeds 14%.

Third, given the importance of population aging to economic and social management, we can clarify the current health status structure, experience, and skills structure, actual employment structure, and the current situation in family responsibility-sharing of the elderly through sampling survey, multi-source data integration and other methods, to provide new data sources and analysis perspectives for accurately grasping the total reserves and development potential of human resources in various countries.

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Declaration of Competing Interest

All authors claim that the manuscript is completely original. The authors also declare no conflict of interests.

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