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News and Highlights

Introduction to Longevity Counties in China

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Since ancient times, humanity has yearned for longevity, viewing health and long life as enduring aspirations. Research has shown that longevity genes may be passed down through certain populations (Costa D, 2019). However, genetics alone is not the decisive factor—environmental conditions also play a vital role in achieving a long life (Selinus O, 2013).

Living in a clean, livable environment, free from pollution and harmful substances, significantly reduces the risk of disease and contributes to greater longevity. In regions where long-lived populations are relatively concentrated, people have identified and evaluated these areas, leading to the emergence of concepts such as "Longevity Village" "Longevity County" "Longevity City" and "Longevity Area" (Honorary Plaque titles). Depending on the evaluation criteria, these areas are further categorized into world-level, national-level, and provincial-level longevity zones.

This article provides a brief introduction to China's longevity regions.

1. Overview

As global population aging intensifies, regional longevity phenomena have attracted increasing attention from both academia and policymakers. With its vast territory and diverse geological settings, China is one of the world's most prominent and representative countries in terms of concentrated longevity phenomena.

The most authoritative body certifying national-level "China Longevity County" is the China Association of Gerontology and Geriatrics (CAGG). Over the past two decades, many regions across China have received official certification and recognition as longevity areas. Some have even been granted internationally recognized titles such as "World Longevity Area". Additionally, several provinces and autonomous regions have adopted the evaluation criteria of the national-level "China Longevity County" and implemented their own provincial-level certification and development programs.

These longevity regions have become important "natural laboratories" for studying the relationships between environment, geology, and health. They also serve as exemplary models for promoting a health-centered approach to regional development.

2. Distribution and typology of longevity counties in China

In 2007, the China Gerontological Society established the first set of criteria for evaluating and designating "China Longevity County". In 2019, the China Association of Gerontology and Geriatrics released a formal group standard titled *Criteria and Methods for Recognizing Longevity Areas* (T/LXLY 0001-2019), which further clarified the concept and methodology for assessment.

According to this standard, a "Longevity County" refers to a county-level administrative unit (county, district, or city) where key demographic indicators —such as average life expectancy, the proportion of centenarians, and the percentage of elderly population —consistently exceed the national average, and where environmental quality, elderly care systems, and other supportive conditions are also notably advanced.

This standard identifies three core indicators and eight supporting indicators (T/LXLY 0001-2019):

Core indicators:

(i) Average Life Expectancy

The average life expectancy of the population in the region must exceed the national average by at least 2 years, reflecting the overall longevity level.

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(ii) Proportion of Centenarians

The number of individuals aged 100 or above must reach or exceed 12 per 100000 of the registered population, indicating the representativeness of extreme longevity.

(iii) Proportion of the oldest-old

The proportion of residents aged 80 and above must exceed 16% of the total population aged 60 and above, reflecting the sustainability of longevity.

Supporting indicators include:

Forest Coverage Rate: At least 5% higher than the national average.

Air Quality: Proportion of days with good air quality ⩾ 90%.

Surface Water Quality: Major rivers and water bodies must meet or exceed Class III of the national water quality standards.

Other considerations: Local policies, elderly welfare systems, healthcare infrastructure, cultural respect for the elderly, income levels, and environmental protections.

2.1. Current status

As of the end of 2024, 110 counties and cities in China have been certified as official "China Longevity County" by the CAGG (Fig.1).

The top provinces with the highest number of longevity counties are: Guangxi: (42), Guangdong (10), Fujian (9), Jiangsu (7) and Shandong (7). Guangxi Zhuang Autonomous Region stands out with the largest number and geographic concentration of longevity areas in the country.

Bama Yao Autonomous County is internationally renowned and has received multiple levels of certification as a world-class longevity area.

Hezhou City is the only prefecture-level city in China where all three counties and two districts have received the "China Longevity County" title, making it the first prefecture-level city to achieve full coverage and be designated as China's first "All-region Longevity City." Other notable longevity cities in Guangxi include Beihai, Fangchenggang, and Yulin.

2.2. Geographical distribution

Longevity areas in China show distinct regional clustering with the following spatial characteristics (Table 1): "*More in the South than the North, more in the East than the West; concentrated in mountainous areas, extended along the coasts.*"

(i) Southern provinces dominate the distribution, especially in humid subtropical regions such as Guangxi, Guangdong, Fujian, Hunan, and Hainan.

(ii) Northern provinces have relatively few longevity counties, with only scattered cases in Shandong, Henan, Jiangsu, and Anhui.

(iii) Mountainous and hilly regions are the most

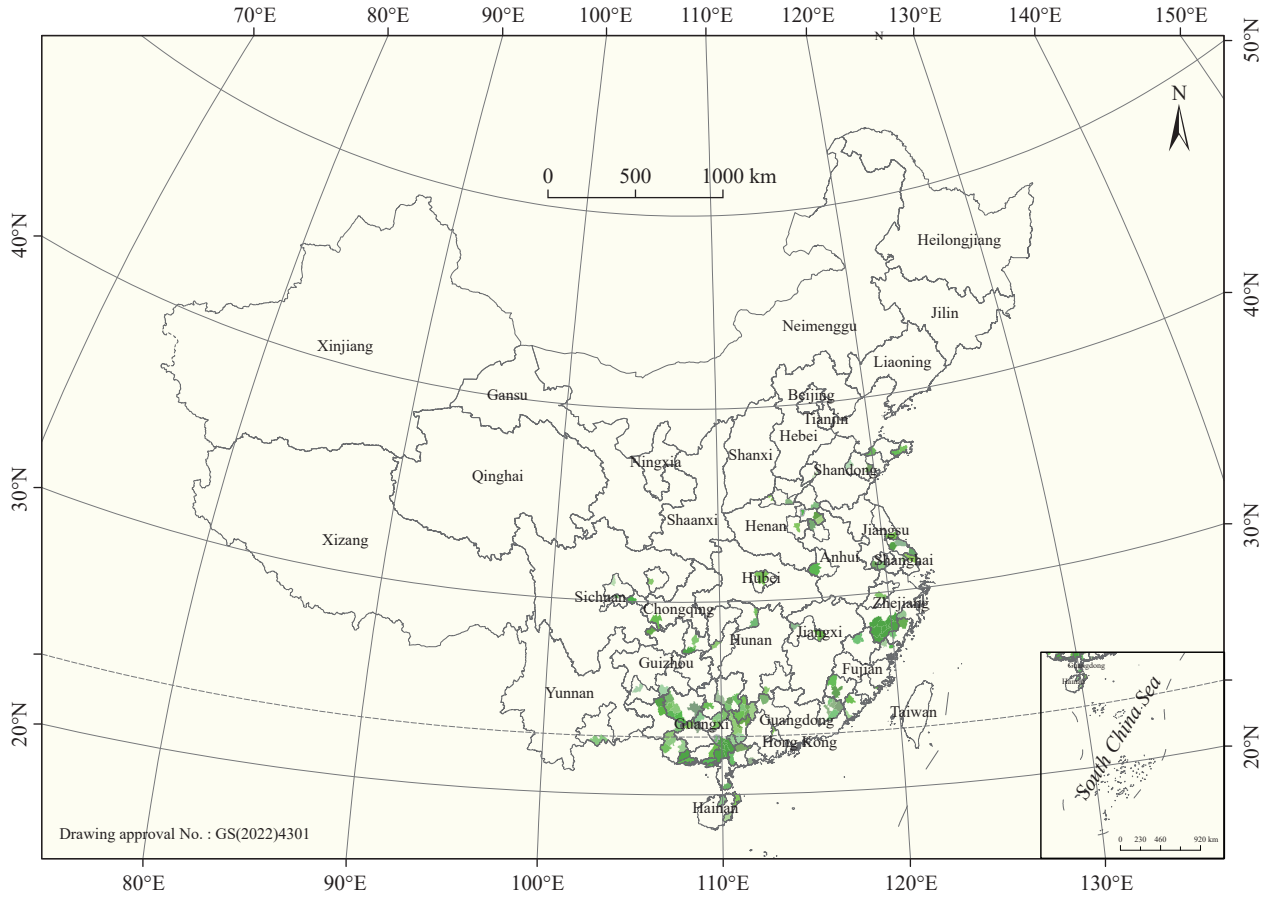

Fig. 1. Distribution of China Longevity Areas.

Table 1. Classification of longevity counties by geographical type.

Geographical region	Representative province	Typical areas	Geographical features
1. Core Concentration Zone: the Southwestern Longevity Belt (Represented by Guangxi)	Guangxi (42 counties/cities – the highest in the country)	Bama, Fengshan, Donglan, Lingyun, Dahua, Tian'e, Jinxiu, Xincheng, Xiangzhou, etc.	Well-developed karst landscapes, surrounded by mountains, pristine water sources, ethnic minority settlements, excellent ecological conditions
2. Southeastern Hilly and Mountainous Region	Guangdong (10), Fujian (9), Zhejiang (5), Jiangxi (2)	Meizhou, Lianzhou, Zherong, Nanjing (Fujian), Shanghang, Wencheng, Tonggu, etc.	Dense low mountains and hills, abundant rainfall, rich vegetation, humid air
3. Yangtze River Delta and Jianghuai Plain Region	Jiangsu (7), Anhui (2), Shanghai (1)	Rugao, Taicang, Yixing, Liyang, Dongtai, etc.	Dense water networks, vast farmlands, strong medical infrastructure, well-developed public services
4. Northern Inland Plains of the Huang-Huai-Hai Region	Shandong (7), Henan (6)	Wendeng, Rushan, Dong'e, Xiayi, Huaiyang, etc.	Flat terrain, well-developed agriculture, four distinct seasons
5. Margins of the Southwest Plateau and Basins	Guizhou (5), Sichuan (4), Yunnan (1), Chongqing (1)	Shiqian, Yinjiang, Chishui, Dujiangyan, Xichong, Jiangjin, etc.	Moderate altitude, undulating terrain, clean air, high-quality water resources
6. Transition Zone of Central South Lakes and Hills	Hunan (4), Hubei (1)	Mayang, Anxiang, Zhongxiang, Hanshou, etc.	Humid lake region climate, dense water networks, favorable ecological environment
7. Tropical Coastal Region of the South China Sea	Hainan (3)	Chengmai, Wenchang, Wanning	Tropical monsoon climate, abundant sunshine, mild temperatures, clean air

concentrated zones. Most longevity areas are located in low-altitude mountainous or hilly terrains between 100–1000 m above sea level—such as: The karst mountains of Guangxi, the border mountains of Zhejiang, Fujian, and Jiangxi, the northern Guizhou plateau.

(iv) Coastal regions also show an extension trend, particularly: Along the Beibu Gulf (e.g., Beihai, Fangchenggang), Southern Guangdong, Fujian's coastline, and Eastern Jiangsu.

2.3. Classification by dominant factors

Longevity Counties in China can generally be categorized into three types based on dominant influencing factors (Table 2).

3. Common geological and environmental features of China's longevity areas

Despite their regional diversity (Table 2), China's longevity areas tend to share several consistent geological and environmental characteristics:

(i) Karst or granite geological settings

These regions are typically characterized by karst formations or granite bedrock, where the groundwater contains a moderate level of dissolved minerals, providing high-quality drinking water and strong natural purification capabilities.

(ii) Soils rich in beneficial trace elements

Local soils are often enriched in selenium (Se), zinc (Zn), calcium (Ca), magnesium (Mg) and other trace elements, which support cardiovascular, immune, and metabolic health.

(iii) Low levels of industrialization

With minimal industrial development, these areas have very few pollution sources, and the concentrations of heavy metals in air and water are significantly lower than national averages.

(iv) High concentrations of negative air ions

Mountainous and forested environments generate more than 1,000 negative oxygen ions/cm^3, which are associated with improved respiratory health and psychological well-being.

(v) Natural farming and traditional agriculture

Fertile soils and traditional farming practices lead to higher concentrations of beneficial minerals in crops, contributing to better nutritional quality.

4. Role of geological factors in promoting longevity

Recent studies suggest that geological conditions may serve as a fundamental support system for the development of longevity regions (Deng QC, 2024). In particular, the trace elements in soil and water have drawn increasing attention for their long-term impacts on public health (Selinus O, 2013). See Table 3 for details.

5. Implications and global relevance

The development of longevity villages aligns closely with the United Nations Sustainable Development Goals (SDGs) and supports the objectives of China's "Healthy China" initiative. These efforts have garnered strong support from local governments, the general public, and academic communities.

By uncovering the intrinsic connections between geological conditions and human health, the concept of GeoHealth contributes to the coordinated development of

Table 2. Types of longevity zones.

Type	Description
Ecological longevity zones	High air/water quality, biodiversity, low pollution
Geological longevity zones	Soils and water rich in beneficial trace elements, low in toxins
Cultural longevity zones	Traditional lifestyles, strong social bonds, low stress, strong tradition of respect for the elderly

Table 3. Mechanisms of geological factors affecting human health.

Geological Factor	Mechanism	Health impact
Soil element composition	High levels of beneficial trace elements such as Se, Zn, Mg, Ca	Supports immune function, cardiovascular health, and antioxidant defenses
Mineral content in water	Groundwater contains moderate levels of Ca, Mg, Sr, with weak alkalinity and low fluoride/arsenic	Promotes metabolism, prevents bone diseases, reduces exposure to toxic elements
Air quality & negative ions	Local topography influences air circulation and vegetation cover, enhancing negative ion concentration	Improves respiratory health, reduces stress, slows aging
Topography & landforms	Hilly and mountainous terrain encourages physical activity and provides a mild climate; karst terrain purifies water	Favors physical fitness, reduces mental stress, improves quality of life
Lack of geotoxic elements	Longevity areas are often remote from industrial zones and low in As, Pb, Cd, Hg and other toxic elements	Decreases risk of chronic diseases and certain cancers

ecological civilization and public health. Much like the international promotion of geological heritage and UNESCO Global Geoparks, longevity village initiatives are gaining broad societal recognition, bringing new momentum to geological sciences, improving regional well-being, boosting local economies, and preserving traditional culture.

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