

# Construction Path of Smart Health Care Platform for the Elderly in China

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**Abstract:** China has a large elderly population, and its aging speed is accelerating, which poses a significant challenge for the country in coping with problems induced by population ageing. To address this, it is necessary to establish a smart health care platform for the elderly in China using modern technologies. In this study, we analyze the construction background, concept, and development status of smart health care platforms for the elderly in China. Using the smart health care platform established in Xihu District of Hangzhou city as a case, we analyze the construction model and challenges of the platform and summarize the common features of the platforms in China. Moreover, we propose an implementation path for platform development in China. The platform should be built to contribute to the establishment of a Healthy China using scientific and technological means and be based on the interconnection of national health care information and data; service resources need to be mobilized to provide a community-based comprehensive service; remote health data monitoring and health management are required to strengthen information support, and geographical advantages need to be maximized to promote local elderly health care industries. Furthermore, we suggest that China should accelerate the construction of its health care industry as well as the transformation of scientific and technological achievements, improve the health assessment system for guaranteeing the physical and mental health of the elderly, accelerate the construction of the relevant standards system, and coordinate urban-rural development in this industry.

**Keywords:** ageing; Healthy China; home-based community care for the elderly; smart health care for the elderly; service for the aged; health care platform for the elderly

## 1 Introduction

According to the communique of the Seventh National Population Census, the number of elderly individuals aged 60 and above in China has reached 260 million. The amount accounts for 18.7% of the total population [1]. Consequently, China is under the enormous pressure of an aging population which is bound to persist for a long duration. With the weakening elderly care function of the family system and diversified needs of the elderly, the traditional pension model can no longer meet the needs of the elderly. Some new impetus should be injected into the pension model. The smart pension model offers a viable solution to China's ageing problem under the background of accelerating development and integration with big data and the Internet of Things [2]. Equipped with information technology and the goal of serving the needs of the elderly, the smart pension will improve the efficiency and accuracy of the service.

In the research field of smart health care for the elderly, the existing research mainly focuses on industrial

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development and platform construction. The former involves the current situation of the development of the smart health care industry [3], the smart health care models for the elderly [4], the integration of the smart health and elderly care industry chains [5], and the development path of the regional elderly smart health and elderly care industries [6]. The latter includes the construction path of smart health care [7], the systemic system of Internet Plus health care for the elderly [8], the parts of the smart health care platform for the elderly [9], the database and supporting system of smart health care platform for the elderly [10], and the service innovation about smart health care platform for the elderly [11]. In addition, some studies highlight the problems of the platform, such as the unevenness of construction of the smart health care platforms for the elderly [12], the low level of information, the limited number of people covered, and the low utilization of services [13]. In general, most of the research on the smart health care for the elderly is focused on one functional module. However, there is little research on the actual community-based operation mode and internal mechanism of the elderly health care platform. It is necessary to combine the construction of the smart health care platform for the elderly with the home-based community care for the elderly. There is theoretical value and practical significance in analyzing the actual operation mode and effectiveness of the smart health care platform for the elderly, to promote the precise and efficient development of the platform.

This study takes the construction and actual operation mechanism of the community-based smart health care platform for the elderly as the entry point for research and focuses on the operation mode of the platform. First, this paper expounds on China's development background of the smart health care platform for the elderly as the basis. Second, this paper takes the platform in Xihu District of Hangzhou city as a case to summarize the operation mechanism and problems faced by the platform's development. Finally, this paper summarizes the common features of the smart health care platforms for the elderly and further proposes the construction path of the smart health care platform for the elderly in China.

## 2 Development background of the smart health care platform for the elderly

### 2.1 Challenges faced by the health care sector for the elderly in China

#### 2.1.1 Large elderly population but insufficient resources for elderly care

With the accelerated ageing of the population, there is much pressure on the supply of health and endowment resources in China. On one hand, China has a large elderly population and is still a developing economy. There is also greater pressure on pension compared to developed countries. In 2017, most of the developed countries such as Japan, Germany, and the Netherlands entered deep ageing, with a GDP per capita of over 35 000 USD [14]. However, the GDP per capita in China is just 71 800 CNY. China is in a typical situation where people age long before they become wealthy. On the other hand, China is gradually forming the "421" and "422" family structures, in which two young people are required to take care of four elderly and one to two children. The pressure on young people is consequently doubling, while the role of the family pension is weakening and the number of elderly individuals living alone and empty nesters is increasing [8]. In contrast to the large demand for elderly care, the number of elderly care institutions, facilities, and beds is seriously inadequate. For example, there were about  $3.29 \times 10^5$  elderly care institutions and facilities and  $8.21 \times 10^6$  elderly care beds in 2020 [15]. The number of beds per 1000 elderly individuals is less than 32, far lower than the 50–70 beds in developed countries. The shortage of elderly care services has become one of the most direct and pressing problems faced by families and society in China.

#### 2.1.2 Diverse needs of the elderly are increasing

The needs of care services for the elderly are highly heterogeneous. Different backgrounds, educational levels, financial situations, and physical conditions affect the specific needs of the elderly. As the quality of life continues to improve and the social environment changes, the needs of the elderly are becoming increasingly diverse, with an increase in the needs for basic physical wellbeing, safety, social interaction, respect, and self-fulfillment. The traditional institutional care model is no longer able to fully adapt to the current and future needs of the elderly. There are also some problems with the model, such as the narrow scope of public services for the elderly and the single content of services [16]. Therefore, it is of great importance to find new ways of addressing the multi-level needs of the elderly.

#### 2.1.3 High prevalence of chronic diseases in the elderly

Chronic diseases such as cardiovascular diseases, hypertension, and diabetes are threatening the health of the

elderly. In 2019, the life expectancy in China was 77.3 years, while the healthy life expectancy was only 68.7 years. This gap means that the elderly are likely to be unhealthy for almost 10 years of their life. The health problems in elderly life are characterized by long course, low control rates, and needing long-term care. Thus, the establishment of care services is especially important for the elderly with chronic diseases, and it is necessary to promote the integration of health and care to improve the health of the elderly.

## 2.2 Concept of the smart health care platform for the elderly

The smart health care platform for the elderly entails the Internet of Things system service platform involving care for the elderly and is also named the smart health pension platform, Internet Plus pension platform, and so on. In recent years, with the rapid development and popular application of Internet technology, smart health care for the elderly has become a rapidly developing industry. The concept of smart pension was initially proposed and actively explored in China in 2012. The 13th Five-Year Plan proposed building a multi-level elderly care service system that is based on the home, supported by communities, and supplemented by institutions. It is expected that more than 90% of the elderly will live in their homes within the community in the future. This provides a realistic fulcrum for the entry of smart health care for the elderly into the community [17]. In 2020, there were  $2.91 \times 10^5$  community-based institutions and facilities for the elderly in China. The number and fraction of coverage are increasing, accounting for 88.4% of the institutions and facilities for the elderly nationwide [15]. The development of new smart care services for the elderly based in the community is an important method of alleviating the shortage of resources for elderly care and nursing care. Smart health pension aims to realize the Healthy China strategy. The main action plan is the community-based smart health care platform for the elderly. The relation framework is shown in Fig. 1.

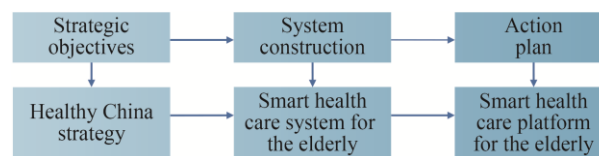


Fig. 1. Objective–system–action framework for smart health care for the elderly.

## 2.3 Construction of the smart health care platform for the elderly

### 2.3.1 Early pilots based on policies

In recent years, China has issued a series of policies to promote the gradual development of the smart health care industry for the elderly and support the growth of smart health care platforms for the elderly. The policies and key points are shown in Table 1. The *Healthy China 2030 Planning Outline* and the *Action Plan for the Development of Smart Health and Aged Care Industry (2021–2025)* both put forward specific requirements for accelerating the construction of smart health care for the elderly. The policies are encouraging the demonstration construction of smart health care for the elderly pilots, establishing the hierarchical dynamic management model, strengthening demonstration and leadership, and providing an experience for other regions [18]. At present, smart health care pilots for the elderly are gradually implemented and beginning to bear fruit. Five batches of provincial and municipal streets, enterprises, bases, and parks have been declared successful from 2017 to 2021. Specifically, there are 634 smart health care application pilots for the elderly, including 342 demonstration streets (townships), 204 demonstration enterprises, 86 demonstration bases, and 2 demonstration parks.

### 2.3.2 Regional imbalances of platform construction

This paper analyzes the list of the five batches of smart health care for the elderly pilots from 2017 to 2021 announced by the Ministry of Industry and Information Technology and the National Health and Wellness Commission. The result showed that the selected pilots are concentrated in provinces such as Zhejiang, Sichuan, Shanghai, Shandong, and Henan. Furthermore, there are imbalances between regions, even between urban and rural areas. In terms of street and township pilots, there are currently 272 street pilots and 70 township pilots, which indicates that the construction of township pilots is lagging behind that of urban streets.

**Table 1.** Smart health care pension policies published by China from 2015 to 2021 (part).

Year	Key points of the policy
2015	The State Council published the <i>Guidance to Promote the Internet Plus Action Plan</i> , which proposed promoting the development of a smart health care industry for the elderly.
2016	The State Council published the <i>Plan of Healthy China 2030</i> , which proposed to standardize and promote Internet Plus health and medical services, and promote the construction of the application system of health and medical big data. The State Council published <i>Several Opinions on Comprehensively Liberalizing the Elderly Care Service Market and Improving the Quality of Elderly Care Services</i> , which made the deployment and development of promoting elderly care services better and faster.
2017	Three ministries and commissions published the <i>Action Plan for the Development of Smart Health and Aged Care Industry (2017–2020)</i> , which focused on promoting the research and use of key technologies and products for smart health care for the elderly.
2019	The Ministry of Civil Affairs published <i>Implementation Opinions on Further Expanding Supply of Elderly Services and Promoting Consumption of Elderly Care Services</i> , which aimed to accelerate the deep integration of the Internet and elderly care services and build a multi-level smart elderly care service system. The State Council published <i>Opinions on Promoting the Development of Elderly Care Services</i> , which called for the implementation of the Internet Plus elderly care action and promoted the application of information technology and intelligent hardware such as artificial intelligence and the Internet of Things.
2020	Six ministries and commissions published <i>Opinions on Promoting Property Service Enterprises to Develop Home-based Community Elderly Care Services</i> , which aimed to promote property services to connect with the smart community system, build a smart elderly information platform, configure service facilities, etc.
2021	Three ministries and commissions published the <i>Action Plan for the Development of Smart Health and Aged Care Industry (2021–2025)</i> , which promoted the innovative development of the smart health care industry further and maintain the continuity and stability of policies. The State Council published <i>Opinions on Strengthening Aging Work in the New Era</i> , which proposed the development of the Internet Plus care services and implementing the Smart Elderly Care initiatives.

### 3 Characteristics of China's smart health care platforms for the elderly: taking Xihu District in Hangzhou City as an example

Many places in China have begun to build smart health care platforms for the elderly. For example, Beijing has established a comprehensive community-based elderly care service platform, which is mainly based on elderly care services and supplemented by supplies for the elderly. The street of Shidongzigu in Shuangqiao District, Chengde City, Hebei Province, has launched a community-based smart elderly care service platform covering various elderly care and medical functions. In Anhui Province, the Luyang District of Hefei has realized interconnection and resource sharing among the government, institutions, communities, and the public through a smart elderly information platform. Zhejiang Province entered the ageing society earlier and has a large number of pilot projects in the construction of smart health care for the elderly. Zhejiang has initially formed a provincial coordinated smart elderly care system, with 45 demonstration streets (towns), 16 demonstration enterprises, and 14 demonstration bases. The three kinds of pilots are all higher than the national average. Therefore, the Xihu District is a good reference for the construction of the smart health care platform for the elderly in China.

#### 3.1 Case study of the smart health care platform for the elderly in Xihu District

##### 3.1.1 Foundations

In 2020, the elderly population in Xihu District was 133 700, with an ageing population of nearly 17.8% [19]. Xihu District has proposed four systems: service integration, talent growth, care standards, and recreation payment, taking into account the reality of the district. Forming a recreation integration model initially provides the necessary foundation for the construction of a smart health care platform for the elderly. The information system of the Xihu District Integrated Recreation Platform has been set up in cooperation with enterprises which are connected to various community health service centers in Xihu District. The platform covers services such as filing, application, in-home assessment, rehabilitation services, and billing. The completed Xihu District smart health care platform for the elderly was selected as one of the pilot projects for the construction of a smart health care system in Zhejiang Province and was included in the list of the third batch of national model bases for smart health care for the elderly.

### 3.1.2 Construction model

The Xihu District smart health care platform is the general control platform for the entire district and is connected to the sub-platforms of each street. The platform realizes the entire process and integrated closed-loop management of health services from assessment, planning, and implementation to billing. It also integrates online and offline services, family beds with intelligent equipment and platforms, and call centers with the platform. Various recreation service scenarios and fragmented services are also integrated with the platform. The reconstructed model of the Xihu District platform is divided into a management port, a user port, and a support port. The management port is the general control platform of Xihu District and the management platform of each street. The user port has a port for the elderly and a port for service providers to improve the convenience of services. The support port involves data systems, cloud platforms, and smart devices in the region. The main functions of the platform are described in Fig. 2.

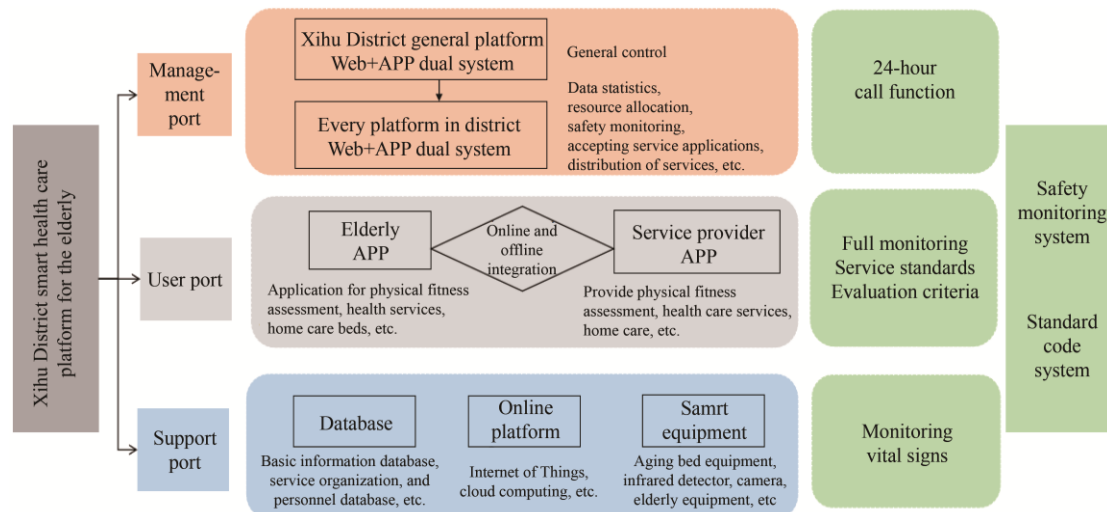


Fig. 2. Construction model of the Xihu District smart health care platform for the elderly.

**Physical fitness assessment.** In 2020, the Xihu District included fitness assessment tests into the regular annual medical check-ups for retirees aged 70 years and above. Since the launch of the Xihu District smart health care platform in 2019, approximately 10 614 fitness assessments have been completed by July 2020. The cost is 30 CNY per person. The assessment data is directly connected to the Xihu District smart health care platform, where the physical conditions of the elderly are documented, and a recreation plan is drawn up based on the assessment results. The assessment agencies generally consist of community health service centers. They are allocated according to the community where the elderly are located. After the assessment, the platform will generate an assessment report automatically, which provides preventive services and knowledge guidance.

**Health services.** After completing the fitness assessment, the platform generates a rehabilitation plan automatically. The elderly can choose a suitable health service plan after consultation and can sign a rehabilitation service agreement with the platform. The platform assigns a service provider based on the principle of proximity to the elderly, after which it assigns the rehabilitation work order to a rehabilitation service provider. The service provider is still a community health service center. During the health phase, the elderly can choose the service provider either at home or participate in group health training at the community health service center. The process of service is monitored dynamically throughout to facilitate control of service quality.

**Home care beds for the elderly.** The home care beds are equipped with intelligent equipment for sign monitoring and safety protection, such as gateways, infrared detectors, cameras, smart mattresses, smart pill boxes, and smart buttons. The equipment transmits the information on vital signs, health management, and home warnings to the cloud service center. The cloud service center sends the processed information to the call center, guardians, and community managers to keep track of the real-time situation to provide necessary services in time. Through the platform, service providers check in twice a day in the morning and evening, and receive 24-hour consultations and emergency assistance for the elderly. They can also send all information to the guardians through the mobile application (APP).

**Additional contents.** The platform has some additional features. The call center function is to respond to

emergency requests for assistance 24 hours a day. The statistical function stores basic information about the elderly in the district, including the total number, gender, age, and assessment data. The return visit and feedback function update the return visit and feedback information to the elderly, their families, and community service providers.

Through the Xihu District smart health care platform, about 26 608 attendances were provided with various services as displayed in Table 2. The fitness assessments and fitness training services accounted for a high proportion of the total attendances. The other services were less frequent. This also indicates that the elderly who participated in fitness assessments usually choose fitness training services for health purposes.

**Table 2.** Various recreation services on the Xihu District smart health care platform.

Services	Number of people (sessions)	Total number of visits (person)	Percentage (%)
Physical fitness assessment	10 614	10 614	39.89
Physical fitness training	2 225	10 575	39.74
Health promotion education	319	3 978	14.95
In-home rehabilitation care	106	1 441	5.42
Total number of people		26 608	100

### 3.1.3 Problems faced

Public awareness of smart pension at home is inadequate. Although several policies on smart pension have been published by the government, adequate resources have not been invested in awareness creation and public awareness of smart ageing at home is low. On one hand, the public is always tentative about new things, the smart service model is different from the traditional family elderly care model, and the new model needs to strengthen its promotion. On the other hand, the ability of the elderly to learn new technologies and methods is weakened, leading to the elderly requiring a certain amount of learning time to respond effectively to smart health care services.

The elderly are less likely to receive the services. One of the dilemmas of the smart pension at home is the low level of actual usage by the elderly, despite the fact that smart pension at home is well designed and planned to support and assist the elderly in many ways. The research team found that the platform's health care services are often promoted with certain discounts; however, some of the elderly only consume part of the vouchers and do not book further services. Regarding the data on health services, the number of free fitness assessments and fitness training services is high, while the number of paid self-training, home rehabilitation, and Chinese medicine physiotherapy services is low.

The initiative of hospital cooperation is not high. The smart health care platform for the elderly is based on the Zhejiang Provincial health care system, which focuses on disease prevention and rehabilitation care. The platform provides medical services for the elderly in conjunction with the community and hospitals. At the beginning of the project, cooperation with hospitals can be facilitated by public welfare. However, this is not a long-term solution and will affect the motivation of hospitals to continue participating. Doctors and nursing staff involved should be included in the hospital's incentive policy and promotion system by establishing and improving the hospital's profit return mechanism. This mechanism can attract hospitals and other institutions to participate in community services, thus maximizing the effectiveness of the platform.

## 3.2 Common features of smart health care platforms in China

### 3.2.1 Integration of online and offline services

The smart pension platform allows the elderly to enjoy quality and convenient services at home through remote assistance. The platform is expected to meet the individual needs of the elderly. The smart health care platform simplifies the service procedures and enables online applications and home services. For example, elderly people with disabilities can access professional rehabilitation and massage therapists without having to leave their homes in Xihu District. The smart health care platform integrates online with offline elderly services and intelligent equipment with the platform. The platform helped to integrate various health service scenarios and fragmented service items efficiently.

### 3.2.2 Effective integration of elderly care resources

The number of elderly people in China is large, but the financial and medical resources are relatively insufficient. The function of family care is also weakening [20]. As the population ages, there is pressure on the supply of health and care resources. To improve the ability to provide effective services on the supply side,



multiple resources need to be utilized and mobilized. The government, society, industry, and individuals need to be brought together to form a strong synergy. The smart platform integrates the information and resources of different sectors in the provision of health and elderly care resources, breaks the sectoral boundaries, and provides health and care services effectively [21]. Through intelligent means, the smart platform connects government, community organizations, medical institutions, and the elderly to integrate relevant resources to realize a new system and mechanism for the operation of elderly services which coordinates supply and matches demand [22].

### 3.2.3 Integration of medical service with health care to support healthy aging

In addition to smart ageing in the community, elderly people are looking for more health guidance and services [23]. The smart pension model at home improves the quality of life of the elderly while relieving the pressure on family care. This allows family caregivers to monitor the indicators and conditions of the elderly remotely with the information provided by the platform, which allows for timely assistance in case of emergencies and enables family caregivers to be informed in time to avoid accidents. Community organizations can use the platform to grasp the physical condition and care needs of chronically ill elderly effectively, allowing them to provide services accordingly. The platform has broken time and space to transform the service model, playing a positive role in reducing the burden of health care for the elderly [24].

### 3.2.4 Satisfying the diverse health needs of the elderly

Families cannot adequately meet the diverse health needs of the elderly. From the construction of recreation platforms across China, the services provided are mainly in the categories of life care, social recreation, rehabilitation, and medical assistance. The specific service categories are developed according to the specific situation of each community. The platform combines modern technology with traditional pension methods to meet the traditional habits in the homes of the elderly and improve their comfort. The platform helps to meet the diverse health needs of the elderly by providing daily care, medical and health care, and safety monitoring services with the help of technological and information equipment and services.

## 4 The construction path of smart health care platform for the elderly in China

### 4.1 Achieving the Healthy China vision via science and technology

The fundamental goal of building a smart health care platform for the elderly is to serve the elderly and improve their health and quality of life through the use of technology methods. It is the response to the ageing to achieve the Healthy China strategy by improving the quality of health services and the level of health protection. Therefore, the construction of a smart health care platform for the elderly should focus on healthy aging and information. More attention should be paid to the accuracy of data and the effectiveness of services. First, the platform should provide health services including health education, preventive care, disease diagnosis, long-term care, and hospice care. It should focus on the health of the elderly. The quality of health services can continuously be improved by using intelligent means, allowing the elderly to enjoy convenient, comfortable, humane, and affordable services. It is a possible way to solve the health problems of the elderly inclusively. Second, commitment to improving the standard of living of the elderly and meeting their diverse needs. Encouraging the community workers to make use of their professional skills to collect and scientifically assess the needs of the elderly reasonably is a method of optimizing the service items, allowing them to sort out the basic public service needs and socialized needs of the elderly. In particular, under the impact of the new coronavirus pneumonia epidemic, the need for health care and psychological comfort services at home has become more prominent [25]. Third, the sustainable operation of the smart health care platform for the elderly should be pursued and community service workers should be encouraged to reach out to the elderly to understand their knowledge of the new smart recreation and their demand for smart products. This will allow for the enhancement of the promotion of the platform and accelerate the effective matching of demand and supply [26].

### 4.2 Promoting the interconnection of health care information and data across China

With the advent of profound aging, constructing a smart health care platform for the elderly will become an inevitable trend. It is particularly important to build the relevant information infrastructure. The information infrastructure is the basic support for the development of the platform for the elderly, mainly including the basic networks, information services, intelligent equipment, and big data centers. The development of smart health care for the elderly promotes the construction of a digital elderly care service system. First, the construction of national

information infrastructure should be improved and the carrying and service capacity of the platform should be comprehensively enhanced. Following this, coordinated regional development should be promoted to support the equalization of basic public services for smart health care. In particular, the layout in rural areas should be sped up to make up for the inadequate construction of information infrastructure. The second is working closely with civil affairs departments and medical institutions to set up a database on elderly recreation, with the elderly as the core and the recreation information as the basis. The construction of basic information across the country should be promoted to clear the digital divide through data interconnection. Building data sub-centers in each city can provide data support for the sustainable development of the elderly smart health care platform over the long term [27]. Third, age-appropriate application development such as the Internet, information services, and intelligent equipment should be guided. The approach of the Internet, big data, and other information technologies to the elderly should be actively promoted to provide age-appropriate services which can help the elderly to better adapt to smart pensions at home.

#### **4.3 Building a community-embedded smart health care service complex**

The home-based community care for the elderly is the main mode of aging care in China, and the resource endowment and efficient integration of the community is the realistic base for the operation of the platform in the community. With the advantages of resource integration, a community-embedded smart health care service complex is being built. The complex takes human health as the center, family as the unit, community as the scope, and demand as the guide. The first is to meet the basic health service needs of the elderly, integrate resources at the community level, and make efficient use of limited medical and health resources. Following this, the profit return mechanism for public hospital cooperation should be improved to reasonably motivate doctors and nursing staff. Second, a multi-service team including community health service centers, medical institutions, and elderly care institutions should be established. The multi-participating service body can alleviate the practical difficulties of insufficient family and social care resources while providing home care, preventive health care, disease treatment, and chronic disease management services for the elderly and chronic patients in the community. Third, cooperation with specialist hospitals to explore the development of geriatric specialties to facilitate access to medical care and diagnosis for the elderly in the community. The geriatric specialties can be orthopedic rehabilitation or chronic disease management for the elderly.

#### **4.4 Strengthening information support to implement remote health data monitoring and management**

Digital information technology is an important solution to support the elderly to age at home and in the community, as the elderly can access long-term care and health services. The support of information technology should be strengthened and the in-depth application of new generation information technologies such as artificial intelligence, Internet of Things, cloud computing, big data, and other products or services should be promoted. First, the platform should enhance the supply capacity of age-appropriate products and intelligent services. The Internet and biometric technologies can be utilized to explore the establishment of convenient remote operation and auditing mechanisms. Encouraging the platform designers, service providers, and enterprises to gain a deep understanding of the elderly's physiology, psychology, habits, and cognition can help to develop more age-appropriate products and services. Following this, the *Catalogue of Products and Services for the Promotion of Smart Health Care* can be enriched and improved. The second is to promote the use of home beds for the elderly, provide remote monitoring and health services for the disabled and semi-disabled elderly, improve the application of home beds, and ageing-friendly transformation of the service model. Smart health services such as telemedicine, personalized health management, Internet Plus care, Internet Plus health consultation, Internet Plus health popularization services relying on the Internet, platforms, and mobile phone apps, should be further developed. Third, education on digital skills should be carried out and guidance on the use of smart products and platform services for the elderly should be provided. For example, mobile phone classes can be organized to provide counselling and exclusive explanations on the application of common apps for the elderly and promote the accessibility of smart health care platforms for the elderly.

#### **4.5 Upgrading the local health care industry by fully exploiting regional advantages**

Relying on regional advantages, all regions will pilot and develop smart models with local characteristics to promote the upgrading of the local health care industry. The first is to rely on the local pension resources and cultural resources to develop the health care industry. For example, the city of Panzhihua in Sichuan Province is



suitable for recreational sports and recreational tourism due to its unique climatic conditions and tourism. Xining City, Qinghai Province is suitable for the development of smart health care platform services owing to its ethnic and plateau characteristics. The second is to make the recreation model more dynamic in the region through innovation by encouraging and guiding grassroots organizations to explore more distinctive and humane reforms. Meanwhile, the innovative experiences explored at the grassroots level can be summarized and disseminated. Third, governments should plan their resources for elderly health and rehabilitation in accordance with local conditions to ensure the reliable or adequate supply of basic and inclusive products and services. Through this the quality of elderly recreation and rehabilitation products and services can be improved.

## 5 Suggestions

### 5.1 Promoting the development of the health care industry and the transformation of scientific and technological achievements

Focusing on the living needs, physical needs, and well-being needs of the elderly, the construction of a long-term mechanism for supply-side structural reform of the health and elderly industry can be accelerated. The health care industry is the core, and a multi-faceted health care industry system can be realized. First, various factors and policy resources should scientifically be coordinated and allocated to speed up the construction of health care industry clusters. Following this, the linkage of government, enterprises, universities, and social organizations can be promoted to form a health care industry system and a science and technology incubation system. The second is to encourage scientific and technological innovation and the transformation of results. Promote the application of artificial intelligence, wearable devices, assistive devices, and terminal equipment in the elderly care sector. The social participation mechanisms should be innovated to create a highly open, fair, competitive, stable, and transparent business environment. Government should increase its efforts to purchase the services from society appropriately to activate the market. Third, the government should formulate incentives and preferential policies to speed up the popularization of smart health care models and platforms. This will allow the elderly in the regions with slower economic and technological development to also enjoy smart health care services. Meanwhile, the age-appropriate design of smart products should be promoted and the ability of the elderly to use smart technology should be enhanced [28].

### 5.2 Improving the mechanism for safeguarding the spiritual needs of the elderly

Meeting the needs of the elderly, and improving their quality of life and spiritual well-being is in accordance with the meaning of active ageing. The mental needs of the elderly should be given due attention and met appropriately. The improvements in the quality of mental life contribute to a better overall quality of life and a greater sense of well-being. Community health centers are still the main source of services for the elderly. The communities should increase their mental health promotion, prevention of mental illnesses, and humanistic care services. First, mental health assessments for the elderly should be strengthened during the fitness assessment phase to prevent mental health problems. Second, the platform should pay attention to the applicability and friendliness for the elderly, as well as consider humanistic care in the development process and improve the system of care services for the elderly. Third, the mechanism of regular visits to the elderly who are living alone should be improved, to prevent and detect unexpected risks. Meanwhile, activities for the elderly that are beneficial to their physical and mental health can be organized.

### 5.3 Improving the capacity assessment system for the elderly

The implementation of a national strategy to actively respond to the aging of the population is suggested. Additionally, the positive concept of the elderly and healthy aging concept should be added to the health care business of the elderly. Furthermore, a trinity health service model of prevention, treatment, and care for the elderly should be constructed. A comprehensive strategy for the prevention and control of chronic diseases can be implemented and the screening and early detection of chronic diseases can be strengthened. First, the early intervention in the management of the health of the elderly should be strengthened, and physical fitness assessments and other screening projects should be promoted to prevent common diseases and reduce the incapacity rate of the elderly. Additionally, the assessment criteria should continuously be improved and adjusted to increase the effectiveness of assessments and the scope of prevention. Second, the physical fitness assessment should be promoted, and the application population should be expanded. Furthermore, the universality of physical

fitness assessment should be maintained, and the scope of services should be expanded. For example, the unemployed and the elderly in rural areas should be assessed. Third, early diagnosis and treatment of key diseases in areas with high prevalence should be carried out, and opportunistic screening for chronic diseases such as cancer, stroke, and coronary heart disease should be promoted. Additionally, full coverage of management and intervention should be achieved for patients with hypertension and diabetes. Appropriate technologies for early diagnosis and treatment of major chronic diseases, such as cancer, should also be gradually incorporated into the consultation and treatment routine.

#### 5.4 Building a standards system for smart health care

High-quality smart health services for the elderly are the inevitable choice for sustainable development. The key to the construction of a smart health care system lies in standardized standards for smart health care systems for the elderly and in realizing the national pension data sharing and cross-regional coordination. It is suggested to speed up the formulation of the national standards for smart health care for the elderly. First, standards for assessing the physical, psychological, spiritual, functional, and social support needs of the elderly should be established on the basis of the pilot projects of the health care system. This can be realized with the assistance of professional efforts. Second, the standards for the construction of the health care platform, intelligent products, physical disability assessment of the elderly, and rehabilitation and nursing of service personnel should be formulated. Third, standards for hardware construction and staffing of basic public services for home and community health care should be formulated. A standardized service process is formed for the training, signing, filing, and services involved in health care services. Service content, service requirements, service management, service quality evaluation, and other subdivision standards should be unified.

#### 5.5 Coordinating the development of urban and rural smart health care industries

Due to the differences in economic levels and educational attainment, it is more difficult to build and operate a smart health care platform for the elderly in rural areas. The focus should thus be on the construction of smart recreation platforms for the elderly in rural areas. The service gap and the digital divide should be narrowed between urban and rural elderly to maintain the coordinated development of the smart health care industry. First, the universality of the products and services provided by the smart health care platform for the elderly should continuously be maintained and the capacity of primary health care institutions should be enhanced to gradually provide home-based services for the elderly. Second, the infrastructure development in rural areas should be strengthened and the coverage of smart health care in rural households should be increased. In rural areas, the use of township health centers or community health service centers can be explored to provide integrated medical and nursing services. Third, enterprises should be encouraged to launch intelligent products that meet the living scenarios, economic conditions, and behavioral habits of the elderly in rural areas, to improve the basic conditions of smart health care in rural areas.

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