

The Analysis of the Current Development and Obstacle of Telemedicine Services in the Graying Society

Xinrui Jiang

School of Economics, Hefei University of Technology, Hefei, China

JiangXinruiSkylar@outlook.com

Abstract. With the increasing percentage of the old in China, the telemedicine services has played an important role in the condition monitoring and management. This paper, based on the analysis of cases and literature, systematically demonstrates the recent context of telemedicine services in China and the current market in China, lists the related political supports of Chinese authorities as well as the hindrances which are faced by Chinese telemedicine in today's society. Though such service, researches suggest, is advantageous in providing quick and convenient diagnosis, treatment. For the gray, obstacles are still standing in the way of the construction of technical infrastructure, marketing, the awareness of such service in the aged, and relevant payment policies for this age group. The Chinese government should complete the infrastructure, and improve the policies and the mechanism, meanwhile strengthening the education toward the target users and encouraging the cooperation and co-ordination among departments, so as to tackle challenges of this remote service in this graying society, and improve the well-beings of the aged in a solid manner, which benefits the elders from such service.

Keywords: Graying society, telemedicine services, development and obstacles, suggestions on development.

1. Introduction

With the increasing population of old people in China, the telemedicine services toward this age group has gained its own reputation. The 7th China population census shows that there are 264.02 million people above 60, whose percentage is 18.70% (190.64 million are above 65, and the percentage is 13.50%) by 2020. In the past few years, the academy has conducted researches of the old-care issue under such context from different aspects. Li Baihe, having had systematic investigation and multi-party data collection, points out home-based old-care mode has become the main choice of current old-care mode and a new nursing industry [1]. Lin Taoyu and colleagues believes that the old are more vulnerable to chronic ailments, that is to say, the gray has a greater demand for remote condition monitoring and treatment [2]. Although the Chinese authority has already begun to promote the treatment-care integration, to build up the long-run care and service mechanism, difficulties still exist in aspects namely financing, techniques and talent supply. On top of it, with the rapid development of China's economy in the past few decades, the traditional family size in China has gradually shrunk, the situation that children go out to work has weakened the mode of family care for the elderly, and the demand for social endowment has become increasingly prominent. Meanwhile, Zhang Yinxi further analyzed that under the background of the rise of the Internet and smart wearable devices, the emerging technology industry has provided more effective health detection means for telemedicine services, which has paved a new path for the old care [3]. Under the background of aging population in China, this paper aims to fill the research gap of exploring how to meet the practical medical needs of the elderly by establishing a good telemedicine service system, so as to reduce the burden of social endowment and ensure that the telemedicine services promote the positive development and virtuous circle of graying economy.

2. Theoretical Basis and Analysis Methods

2.1. Related Definition

UN report on World Population Aging: 1950-2050 shows defines that population aging refers to the process that the proportion of the elderly population in the total population increases, and the United Nations defines the elderly as people aged 60 and above [4].

The World Health Organization defines telemedicine as a modern medical means that uses information technology to provide medical and health services to patients despite time and location. Its core lies in solving the problem that when medical personnel and patients are not in the same time zone or place, the former uses relevant technical means to realize information transmission and communication, carrying out a series of medical and health services such as the evaluation of patient's condition, treatment, the monitoring of health status.

2.2. Theoretical Basis

The relevant theories of the World Health Organization on health management point out that health management, aiming at sustainability, fairness and efficiency, should constantly adapt to the aging trend of the world, which provides theoretical basis for China to address challenges of population aging and improve telemedicine services.

2.3. Analysis Methods

Based on the aging population in China, this paper analyzes the development and obstacles of telemedicine in China. This paper adopts the method of case analysis, firstly combing the evolution of tele-medicine, then summarizing the government data and the data of related medical institutions and enterprises, and deeply discussing the main problems encountered in the practice of telemedicine service in China.

3. The Current Condition of Telemedicine Services In China

3.1. Political Support and Market Circumstances

The number and frequency of telemedicine-related policies in China are increasing year by year. As can be seen from Figure 1, the relevant policies from 1997 to 2010 are not many, and no great increment is seen in this period. Since 2010, the number and frequency of many relevant documents and policies issued by the National Health and Wellness Commission of China and the Bureau of Traditional Chinese Medicine has risen sharply, reaching the peak around 2017. During this period, the policies such as Administrative Measures for Internet Diagnosis and Treatment (Trial) and Administrative Measures for Internet Hospitals (Trial) has been issued, which reflected that the Chinese government paid more attention to telemedicine. The introduction of these policies has also laid a foundation for telemedicine services in China, creating an enabling market for telemedicine development.

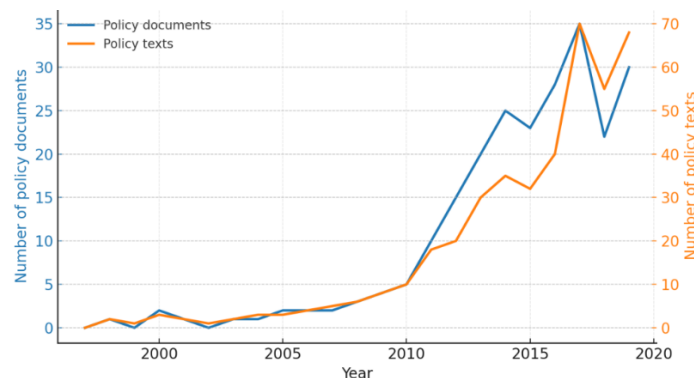


Figure 1. Overview of telemedicine policies in China (1997–2019) [5]

3.2. The Old's Demand for Medical Services

Studies have shown that the demand for medical services of the elderly group increases gradually with age, especially for those over 75 years old. In terms of specific medical service demand, it presents diversified characteristics. Relevant research shows that old-age health monitoring and long-term management of chronic diseases, such as regular follow-up, blood pressure and blood sugar monitoring, etc., are the core requirements, which, in contrast, is slightly higher than the demand for security-related services. At the same time, rehabilitation care, home-visiting and accompanying-visiting diagnosis are also topics of general concern. Additionally, the demand for psychological counseling and spiritual consolation services is relatively high, and some life care closely related to health also occupies a certain proportion in the demand for old-age care for the elderly [1].

Specifically, the acceptance of telemedicine by the elderly depends on their trust in the safety of telemedicine products and providers of such services. The higher the trust, the stronger their willingness to use telemedicine products. Meanwhile, the expectations of the elderly for telemedicine in health improvement and disease management can also effectively influence their willingness of telemedicine in practical utilization [5].

3.3. Case Analysis

Alibaba Health, which is mainly engaged in self-operated medical business, medical e-commerce platform business, medical health and digital service business, with its advantages in the fields of Internet technology and digital technology, has gradually built its own medical model to provide patients with more convenient medical services over the past few years. The financial report of Alibaba Health in 2024 demonstrates that, by March 31st, 2024, the annual active users of Tmall Health Platform reached 300 million, and the number of serving merchants exceeded 35,000, with a year-on-year increase of 28%.

As can be seen from Figure 2, the total income of Alibaba Health has seen an overall upward trend from 2019 to 2025, and peaked in 2023. The year-on-year growth rate fluctuated greatly, and experienced the zenith and the valley in 2023 and 2024 year respectively. Generally speaking, the overall scale of its telemedicine service platform kept growing, and such service has been a rigid demand for the aging population in recent years, which has provided a market foundation for the industry. Telemedicine still has development prospects in meeting the needs of the huge elderly population in health management, chronic disease follow-up and in-home rehabilitation. It is not difficult to see from the leading enterprises such as Alibaba Health that the development of telemedicine can rely on modern technologies such as the Internet to achieve rapid market expansion and turnover growth, but at the same time it also faces the instability in the external environment which troubles the development of the telemedicine industry in the coming future, and this case also provides some references for the development of the industry.

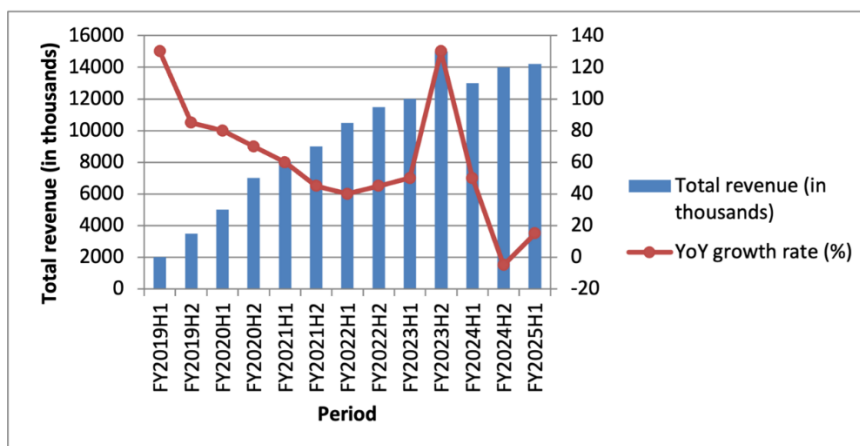


Figure 2. Alibaba Health revenue and growth rate (million RMB, %) [6]

Unlike Alibaba Health, which promotes online medical consumption by the medical services and e-commerce integration, Ping An Good Doctor takes medical services as its core quality and has built a comprehensive health management system featuring “online + offline + home visiting + enterprise visiting”. Such system has integrated 50000 doctors in 29 departments, nearly 4000 hospitals, 235000 pharmacies and more than 150 old-caring institutions, realizing the full chain coverage from online consultation, medicine distribution to home-based nursing. Technically, the AI application of Ping An Good Doctor has significantly improved the service efficiency and quality, with the accuracy of physical examination interpretation reaching 98% and the efficiency of family medical service improving 62%. According to the company's financial report, Ping An Good Doctor has achieved a revenue of 4808 billion yuan in 2024, a year-on-year increase of 2.9%, and a net profit of 88.3 million yuan, which has gained profit in all aspects for the first time and has accumulatively served 2049 corporate customers, up by 35.9% year-on-year; There are 31.35 million paying users, including 24.81 million in Business-to-Consumer section and 5.81 million in Business-to-Business section. All these results show that the company has established a solid foundation in user scale and profit model, which is expected to push China telemedicine from "supplementary channel" to "core medical service" with high quality, scale and sustainable development [7, 8].

4. The Obstacles of Telemedicine Services in the Graying Society

4.1. Obstacles in Technique and Infrastructure

Whether the telemedicine is conducted effectively depends on whether the network environment is stable, whether the information system is compatible and whether the medical equipment can operate under high load. However, related research shows that in some underdeveloped areas, high-performance teleconsultation equipment, image acquisition devices and their maintenance costs are a big economic burden for primary hospitals, and related medical personnel lacks systematic and targeted training on the use of related equipment, which leads to the failure to make full use of hardware resources [9]. In addition, the insufficient coverage of broadband network in remote area leads to the low transmission rate and instability meaning that it is difficult to meet the transmission requirements of high-definition images, real-time audio and video, and it is prone to network latency and lag, which explains why the related telemedicine infrastructure construction is below the standard and becomes an important bottleneck for its effective implementation on the basic level. Taking county hospitals in Guangxi province as an example, although most of them have established teleconsultation systems, and hospitals have the demand for online consultation, the relevant equipment and means of consultation have not been updated, which reduces the accuracy and efficiency of consultation and diagnosis, lowering the willingness in these basic-level hospitals carrying out telemedical treatment [10].

4.2. Obstacles in Cognition and Acceptance in Chinese Market

Although the telemedicine services are backed by a series of political supports from the authority of China and has a certain amount of market demand, residents' cognition and acceptance of such services are still insufficient, which has become an obstacle to the market expansion and popularization of telemedicine. Related research shows that there are significant disparity in the understanding and acceptance of telemedicine between people in different regions and in different age groups. Surveys conducted in Pudong, Shanghai suggests that only 7.34% of the respondents are “very familiar” with the Internet hospitals, and 2.78% of the residents are “completely ignorant”, while 62% of the residents have used them, but less than 10% of them are regular users [11]. Additionally, there are also studies reporting that the willingness to use telemedicine is in an inverse relationship to the concern of security and privacy, which means that even if residents know about telemedicine services, they may still be reluctant to choose telemedicine as the first choice if they lack trust in data security and privacy protection [11].

5. Optimizing Strategies and Suggestions

5.1. Improve the Infrastructure

In order to achieve the spread and popularization of telemedicine services, which requires sufficient technical supports and infrastructure, relevant departments should increase investment in telemedicine, build a more comprehensive network medical cloud platform, fulfill the collection of relevant data, and further promote the popularization of telemedicine services in the elderly population [12]. Therefore, it is necessary to speed up the upgrading of related hardware equipment, the construction of a unified platform, and the maintenance and training mechanism. The popularization of telemedicine needs stable technical support and comprehensive medical infrastructure. As is mentioned above, some remote areas and basic-level medical institutions have shortcomings in hardware equipment, network conditions and data platform construction, which affects the timeliness and accuracy of diagnosis and treatment. Therefore, improving infrastructure construction is not only a prerequisite for improving the quality of telemedicine, but also an important way to promote medical equity.

It has been mentioned that in some remote areas, primary medical institutions are weak in hardware equipment, network conditions and data platform construction, which affects the timeliness and accuracy of diagnosis and treatment. Therefore, improving infrastructure is not only a prerequisite for improving the quality of telemedicine, but also an important way to promote medical equity. International experience can also confirm this view point. For example, rural telemedicine projects in many African countries rely on satellite Internet, community Wi-Fi as well as mobile communication networks to achieve digital coverage of cross-regional medical services, significantly reducing the necessity of patients visiting central hospitals and improving the timeliness of follow-up of chronic diseases [13].

In terms of the technical architecture, the current mature telemedicine systems generally adopt a multi-layer architecture combining short-range wireless communication (such as Bluetooth, Wi-Fi, ZigBee) and long-range communication (such as 4G/5G, satellite network). The physiological data collected from patients are transmitted to community medical nodes through local networks, and finally updated to hospital systems or cloud platforms through long-range networks to realize stable transmission and real-time consultation [14]. This mode not only improves the accuracy of diagnosis and treatment, but also reduces the cost of system integration and maintenance. By learning from these former practices, in the process of promoting the construction of telemedicine, China can also improve the coverage of communication network stage by stage, promote the popularization of unified standard equipment, and bring telemedicine platform into the health information system, so as to effectively improve the medical accessibility and diagnosis and treatment efficiency in grassroot areas.

5.2. Improve Policies and Payment Mechanism

Although digital payment in China is very convenient at present, mastering it is still a challenge for the gray. Nowadays, there are still some deficiencies in the co-pay scope, proportion and settlement method of medical insurance in China. Some telemedicine projects are not included in the medical insurance catalogue or the reimbursement ratio is rather low. In addition, there is no standard in the settlement in various places, and the online settlement function is not popularly accepted and used at the grassroot level, which brings great difficulties to patients, especially the elderly, when using such services, with higher economic and operational thresholds [15]. Therefore, it is urgent to innovatively establish relevant payment mechanisms and introduce more convenient payment policies for the elderly. For example, promote cross-regional medical insurance and timely settlement and payment methods which suits the elderly, and improve data security and privacy protection standards to reduce patients' concerns about the use of telemedicine and improve the accessibility and efficiency of the elderly in the field of telemedicine.

5.3. Strengthen the Education and Technical Training to Users

To further improve the old's acceptance of telemedicine, communities together with related institutions and workers should strengthen education and publicity for elderly users. For example, relevant public lectures and home-visiting publicity by volunteers are held to help the elderly embrace telemedicine in a way that is easy for them to accept and understand. At the same time, it is also necessary to do the popularization and publicity work to the children of the elderly and other related families, and all of the above will be a help in the popularization and application of telemedicine in the elderly group together, meanwhile build a multi-party cooperation mechanism among families, communities and society to simultaneously improve the sense of health acquisition and telemedicine service experience of the elderly group.

As for the problem that old men are not adept at digital devices, some studies have pointed out that the use training in the form of telephone communication combined with written instructions can effectively help them complete the installation of telemedicine applications, equipment setting, and video consultation preparation, thus improving the success rate of online consultation [16]. At the same time, the interactive guidance system (such as Synapse) uses multi-modal support, namely interface highlighting, voice prompt and error correction, through step-by-step demonstration and fault-tolerant mechanism, which reduces the anxiety of elderly users in the learning process and improves the operation efficiency to a certain extent [17].

In addition, building a digital health management system for the elderly can further enhance the long-term application of telemedicine. By integrating technologies such as wearable devices, smart homes and Internet of Things, health monitoring and risk analysis are realized, and personalized intervention can be provided by artificial intelligence, which can meet the multi-dimensional health needs of the elderly at the same time [18]. This mode of combining training digital technology which is tailored for the old, not only helps to improve the digital health literacy of the elderly, but also promotes the continuous promotion and effective execution of telemedicine.

6. Conclusion

This paper analyzed the development and obstacles of telemedicine services in China under the background of aging in China. The results show that with the deepening of the aging population in China, the gray's demand for telemedicine in chronic disease management, rehabilitation nursing and daily health monitoring is increasing. However, in the detailed procedure of the application of telemedicine services, it faces loads of obstacles, such as insufficient infrastructure, high price, insufficient trust of the elderly in telemedicine, and unfamiliarity with online payment operations. In this context, increasing investment in infrastructure construction, optimizing medical insurance and payment system, conducting targeted and systematic training on digital skills of the elderly, and organizing volunteers to provide face-to-face services have become essential measures to promote the sustainable development of telemedicine in the context of an aging society in China.

The significance of this paper is to provide references for the development of related medical industries and the policy making. For government departments, this paper emphasizes the allocation of social resources, improve the construction of the infrastructure and the platform, and providing guaranteed telemedicine equipment for the elderly. For the relevant medical institutions, this paper emphasizes enhancing the trust of the elderly in using telemedicine services and improving the information security and confidentiality.

However, this paper is mainly based on the integration and analysis of existing literature, without a large number of first-hand data, which may affect the universality of the conclusion. And because the telemedicine market and policies in China have changed a lot, it is impossible to detail the situation and obstacles in each stage.

Future researches can further expand the sample range, combine similar national cases, conclude cases and date from different regions and medical institutions from different levels, and carry out multi-sample quantitative analysis, so as to better evaluate the influence of medical infrastructure

construction and relevant policies on the old's acceptance and usage of telemedicine in the context of China's aging.

References

- [1] Li Baihe, Lu Weihua, Lyu Feifei, Shang Zhiwei. Research and analysis on the current situation of community-based home elderly care services in China. *Aging Research*, 2025, 12 (1): 1-10.
- [2] Lin Taoyu, Fang Pengqian. Research on regional medical service models and countermeasures for elderly chronic diseases under the background of population aging. *Chinese Hospitals*, 2025, 29 (4): 40-46.
- [3] Zhang Yingxi. Research on the path and countermeasures of promoting high-quality development of the silver economy through technological innovation. *China Social Sciences Today*, 2024, 11: 29.
- [4] United Nations Department of Economic and Social Affairs, Population Division. *World Population Ageing: 1950-2050*. New York: United Nations, 2001: 1-198.
- [5] Zhang Wei, He Dong, Zhang Yan, Luo Peng, Zhu Chengyan. Analysis of national-level policies on telemedicine in China from the perspective of policy tools (1997-2019). *Research on China's Health Policy*, 2020, 13 (6): 6-9.
- [6] Guosen Securities Research Institute. Alibaba Health (00241.HK) 2024 Mid-Year Performance Outlook: Post-pandemic Revenue Maintains Rapid Growth. 2023-10-22. Available from: https://pdf.dfcfw.com/pdf/H3_AP202310231602717429_1.pdf.
- [7] Ping An Health Medical Technology Co., LTD. Audited Annual Report for the Year Ended December 31, 2024. 2025. Available from: <https://www.hkexnews.hk>.
- [8] Zhou Xinming, Wang Rui. Ping An Good Doctor (01833.HK): Internet healthcare has a bright future and industry leaders rise strongly. Huajin Securities Research Institute, 2020-04-07. Available from: <http://www.huajinsc.cn>.
- [9] Xu Zhaopeng, Zhang Lufa. Spatial proximity advantage, internet healthcare and hierarchical medical treatment: a survey on the choice of first-visit medical institutions for urban residents in the Yangtze River Delta. *Research on China's Health Policy*, 2023, 16 (9): 30-36.
- [10] Xi Shouwen, Zhang Jianbo, Zhu Peng. Research Progress of Telemedicine in Surgery. *Advances in Clinical Medicine*, 2025, 15 (1): 2184-2192.
- [11] Huang Yushu, Wang Qiangian. Analysis of the current situation and countermeasures of telemedicine development in Guangxi. *Health Economics Research*, 2016, (6): 32-33.
- [12] Kong Leijia, Hou Yumei, Zheng Diwen. Research on telemedicine policy and patient social welfare based on Dynamic Game Theory. *Health Economics Research*, 2023, 40 (1): 176-186.
- [13] Toritsemogba Tosanbami Omaghomi, Jeremiah Olawumi Arowoogun, Opeoluwa Akomolafe, Ifeoma Pamela Odilibe, and Oluwafunmi Adijat Elufioye. Telemedicine in Rural Africa: A Review of Accessibility and Impact. *World Journal of Advanced Research and Reviews*, 2024, 21 (2): 421-431.
- [14] Caroline Omoanatse Alenoghena, Henry Ohiani Ohize, Achonu Oluwale Adejo, Adeiza James Onumanyi, Emmanuel Esebanme Ohihoin, Aliyu Idris Balarabe, Supreme Ayewoh Okoh, Ezra Kolo, and Benjamin Alenoghena. Telemedicine: A Survey of Telecommunication Technologies, Developments, and Challenges. *Journal of Sensor and Actuator Networks*, 2022, 11 (3): 53.
- [15] Liu Xiaoqing, Yan Yuzhong, Zhao Jiangxia. Investigation on the current situation of residents' cognition and acceptance of internet hospitals in a certain district of Shanghai. *Chinese Hospital Statistics*, 2022, 29 (3): 211-215.
- [16] Emer Galvin, Shane Desselle, Blánaid Gavin, Fiona McNicholas, Shane Cullinan, John Hayden. Training Service Users in the Use of Telehealth: Scoping Review. *Journal of Medical Internet Research*, 2022, 24 (6): e36408.
- [17] Jin Xiaofu, Hu Xiaozhu, Wei Xiaoying, Fan Mingming. Synapse: interactive guidance by demonstration with trial-and-error support for older adults to use smartphone apps. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 2022, 6 (3): 1-24.
- [18] Ge Zhenxing, Li Xiaoguang, Wang Hui. Research progress on digital health management for the elderly. *Life Science*, 2023, 35 (8): 1004-1010.