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Retraction

Retracted: Balance of Public Medical and Health Services and Reform of Medical Institutions Based on 5G Sensor Technology

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] F. Xu, "Balance of Public Medical and Health Services and Reform of Medical Institutions Based on 5G Sensor Technology," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 4217888, 11 pages, 2022.

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Research Article

Balance of Public Medical and Health Services and Reform of Medical Institutions Based on 5G Sensor Technology

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Since its reform and opening in 1978, China's economy has grown rapidly and human life and physical well-being have improved significantly. The public health care system is an imperative guarantee of people's life and physical health. It is necessary to establish a reasonable planning, a reasonable division of labor, and an efficient medical service system to improve the overall efficiency of health care services and ensure the physical health of the people. The balance of public health care services plays a very important role. It plays a very important role in safeguarding people's basic right to health, regulating social fairness and justice, promoting the sustainable development of medical and health services, and building a harmonious society. Based on 5G sensor technology, this paper combines relevant research on sensor technology at home and abroad and comprehensively uses related theories such as sensing principles and health care services to discuss the internal operation mechanism of China's public health care service system. It conducts experiments to compare health care services with 5G sensor technology with existing health care service systems. It compares its bed occupancy rates, hospital admissions and discharges, outpatient and emergency department volumes, and average inpatient costs. It studies the impact of 5G sensor technology on public health care services. The experimental results show that after adopting 5G sensor technology, the average bed utilization rate in the H hospital is 88.71%. The total number of hospitalizations was 9.845 million, and the total number of discharges was 8.668 million. The total number of outpatient visits was 44.259 million, and the total emergency department was 7.694 million. The per capita cost of inpatients in H hospital is 15,840 yuan, and the per capita cost of inpatients in W center is 9,661.75 yuan.

1. Introduction

After 1978, China's medical and health care has experienced a swift advancement and has made world-renowned achievements. For example, it has established a medical and health system involving towns and villages, enhanced disease prevention and control capabilities, and expanded medical insurance coverage. It improves the security level of medical insurance and improves the pharmaceutical production and distribution system. The public medical system is steadily advancing in primary medical institutions. It meets the health demands of the public substantially and strengthens the health status of the public remarkably.

In the new medical reform in 2009, the basic medical insurance system, the establishment of an essential drug system, the improvement of the primary health care service system, the step-by-step equalization of public hygiene care, and the reform of public health care facilities were clearly proposed. The core of the new health care reform is to safeguard people's health rights and interests. Since the execution of the new health care reform, the reforms in these five areas have made the basic medical insurance system fully cover the basic health care security of people living in towns and villages. The accessibility and service quality of primary health care services have been significantly improved. And the financial affordability of people's health care treatment has been greatly eased. However, along with the continuous improvement of China's health care system, its system defects have become increasingly obvious.

The current development level of medical services in China cannot fully satisfy the people's demands for health care. The contradictions that are not suitable for the overall and coordinated economic and social development are more prominent, which are manifested in the following two levels:

first, the distribution of medical facilities in the region, towns, and villages and between groups of people is unbalanced. The development of health services is unbalanced, and medical care is unbalanced. There is a certain gap in the level of hygiene. The service level of primary medical institutions is not yet able to adapt to the needs of the local population to seek medical treatment nearby. However, the existence and solidification of the mechanism of "supporting medicine with medicine" in public hospitals makes the medical expenses continue to rise, and the utilization efficiency of limited resources is low.

How to choose the basic medical and health care system reform model and how to better build a basic medical and health care system covering urban and rural residents are directly related to the future of a country and a nation. This has increasingly become an important subject of modern democratic government governance. This paper takes public medical and health services as the specific research object, combined with 5G sensor technology, through literature research method, data analysis method, and inductive analysis method to conduct qualitative analysis on the basis of quantitative and analyze specific cases. This topic is based on sensor technology and uses 5G communication technology to realize the application research of 5G sensor technology in public health care services. The work of this paper is mainly divided into three parts: the principle of sensor technology, the related research on public health care services, and the experimental exploration of public health care services based on 5G sensor technology. This provides decision-making basis for the long-term development of the national basic health care system and the reform and growth of health undertakings.

2. Literature Review

In recent years, researchers from various countries have discussed the application and development prospects of 5G sensor technology in various fields. They have done relevant research on all aspects and applications of 5G sensor technology. Ruthramurthy and Pari used MATLAB to simulate a simple temperature sensing circuit using a thermistor to sense human body temperature. This method can be used in smart access control systems to sense the desired temperature value. The physical resistance and temperature calculation circuit show a real-world scenario of a thermistor. The IF-ELSE circuit analyzes the voltage output of the thermistor. In addition, there is a voltage amplification circuit to amplify the voltage from the thermistor when it acts on the external temperature [1].

Raza et al. studied ultrareliable and low-delay communication in industrial wireless sensor networks. In this paper, they proposed a mixed and multiple-channel approach for improving the efficiency and output of the total system. This method adopts various channels to increase the total output of the network and improve the stability of the network. Compared with the state-of-the-art, their proposed scheme significantly improves network reliability and throughput [2]. Sun et al. used BiLSTM, a bivectoral long-term and short-term memetic neural network, to model and linearize the behavior of a broadband radio frequency amplifier for a 5G wireless communication system. He built a BiLSTM-based behavioral model with a corresponding digital predistortion model by coordinating noncausal relationships. The experimental results demonstrate the effectiveness of the system. The BiLSTM network can characterize, model, and linearize RF power amplifiers [3]. Mahyastuty and Iskandar proposed a basic high-resolution system based on a wireless sensor network. The algorithm can predict the movement of high-resolution platforms and support a large number of nodes. It uses simulations to calculate the operating system of the target algorithm and the effect of high-level motion on the number of unconnected sensor components. Many simulation results show that the proposed clustering algorithm can predict the motion of high-resolution platforms and reduce the number of unconnected sensor components [4]. Qiu et al. discussed security requirements and scales for large IoT in 5G time. In addition, it also proposes security requirements and scales at various levels, such as sensor control applications and IoT cards, IoT networks and transports, IoT transaction applications and services, and IoT security management and performance [5]. Jiang et al. designed a discreet improvement of the one-channel text separation algorithm for transmitting text sensor signals. It combines two convergent methods of factorization of a nonnegative matrix and diagonalization of proximity together of the eigen. It adopts speech enhancement technology based on automatic particle conversion to improve efficient speech signal separation. Experimental results show that the algorithm is very useful. It can support text signal transmission technology received from multiple text sensors [6].

3. 5G Sensor Technology and Public Health Care Services

3.1. Sensor Technology. A sensor is a device. It can only sense predetermined measurements, which are then converted into transmittable signals according to specific rules. A sensor is also a transformable device. It can convert one energy source into another. Usually, the converted form is convenient for us to measure. It is usually the power. There are many forms of electricity, such as current, voltage, and capacitance. Generally, it will choose different output power forms according to different situations.

The sensor has two components: the sensor component and the switch component. The attention span is used for direct contact with a measuring object. The conversion element converts the sensed current into easily measurable electricity. The sensor generally also has a signal amplification circuit [7]. The block diagram of the sensor is shown in Figure 1.

Sensors are closely related to detection technology. The detection technique is the sensor's acquisition of the measured window [8]. The sensor is at the interface between the measured object and the detection system. This shows the importance of detection technology. Therefore, it is necessary to first understand and master the detection technology in order to better use the sensor.

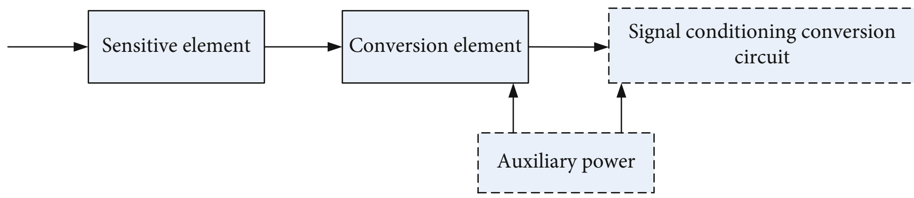

Figure 1: Sensor composition block diagram.

The first job of inspection technology is measurement. To obtain a set of measured data, it must be measured before a quantitative result can be obtained. Measurement is the determination of the value being measured. That is, it compares the measured data with the measured standard quantity with the same characteristics, thereby determining the product of the measured data and the standard quantity. The measurement can be expressed by the following formula:

$$x = n\mu, \tag{1}$$

where x is the unit of measurement and μ is the quantity, i.e., a unit of measurement, and is multiplied.

The basic block diagram of the detection system is shown in Figure 2.

The sensor is connected to a metered object and a signal receiving circuit. The circuit tuning signal receives what is measured by the sensor and then processes the signal [9]. An actuator usually refers to a device that can control, regulate, or protect an instrument. In the measurement system, it can be divided into two types of open-loop and closed-loop systems. In an open-loop system, the direction of information transfer is single. The structure diagram is shown in Figure 3, and its input and output relationship is as follows:

$$y = k_1 k_2 k_3 x. \tag{2}$$

In the formula, k_1, k_2, and k_3 are the transfer coefficients between each link, respectively.

The error of an open-loop system is the sum of the errors of each link. The structure of the open-loop system is relatively simple, and due to the possibility of instability in each link, it will lead to measurement errors.

For a closed-loop system, there are two channels for its information direction. One is the forward channel, and the other is the feedback channel. Its input-output relationship is as follows:

$$y = \frac{kk_1}{1 + k\beta} x \approx \frac{k_1}{\beta} x, \quad k = k_2 k_3. \tag{3}$$

In the formula, β is the feedback coefficient.

Since the closed-loop measurement system has a feedback link, the measurement error can be reduced, or even no measurement error will be generated. Its system block diagram is shown in Figure 4.

In Figure 4, error Δx can be expressed as

$$\Delta x = \frac{x - L}{L}. \tag{4}$$

The relationship between the output and input of the sensor is its most basic characteristic. Different sensors output electricity in different forms, which are related to their own basic characteristics [10]. Sensors have both static and dynamic characteristics.

As far as the static performance of the sensor is concerned, if the input signal is static, the correlation between its output and the input quantity will not change over time; that is, the output quantity can be expressed by a nontime formula. Its input quantity x and output quantity y can be expressed by the following formula:

$$y = a_0 + a_1 x + a_2 x^2 + \cdots + a_n x^n, \tag{5}$$

where a_0 is the output when the input is 0 and a_1, a_2, ... a_n are the nonlinear coefficients.

The static performance of the sensor can be described by several aspects such as sensitivity, linearity, repeatability, hysteresis, and drift .

3.1.1. Linearity. Using a certain standard level of instrument, under static conditions, the sensor is subjected to repeated cyclic tests to obtain its input-output performance curve. It is generally desirable for the sensor to have a linear characteristic to facilitate calibration and data processing. But in actual measurement, the curve of the input-output characteristic can only be approximated as linear, and there are still some deviations compared with the linear straight line, as shown in Figure 5.

The linearity of the sensor can be expressed by the following formula:

$$\gamma_L = \pm \frac{\Delta L_{\max}}{Y_{\mathrm{FS}}} \times 100\%, \tag{6}$$

where $\Delta L_{\max}$ is the absolute error of the maximum nonlinearity and Y_{FS} is the output value of the sensor full scale.

3.1.2. Sensitivity. The sensitivity of the sensor refers to the ratio of the change Δy of the output of the sensor to the change Δx of the input, which can be expressed by the following formula:

$$S = \frac{\Delta y}{\Delta x}. \tag{7}$$

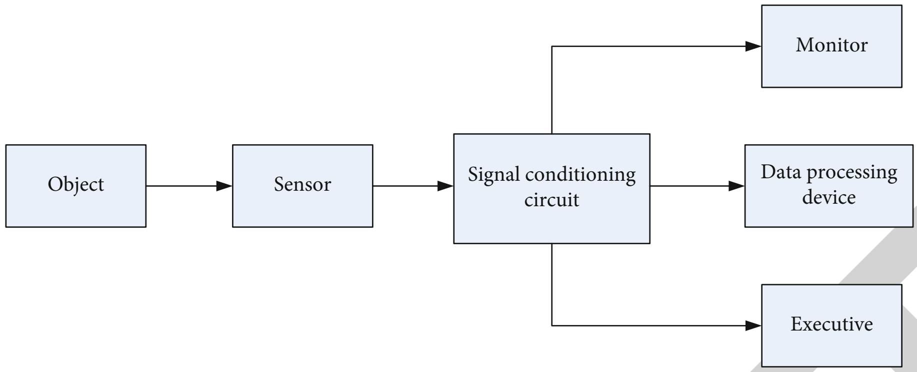

FIGURE 2: Basic block diagram of automatic detection system.

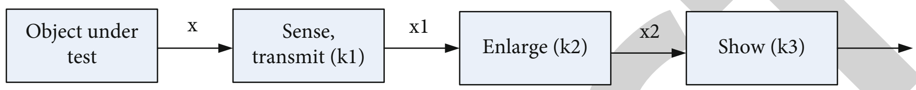

FIGURE 3: Open loop system block diagram.

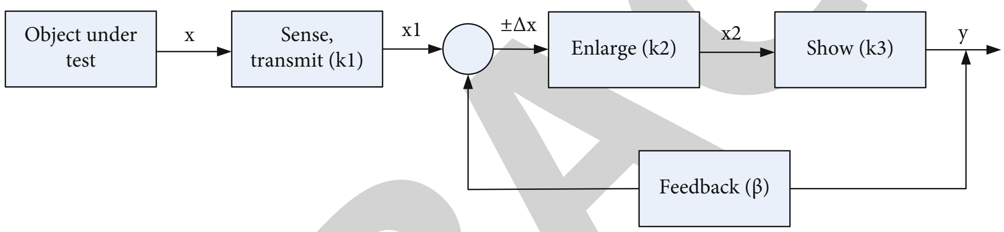

FIGURE 4: Closed-loop measurement system block diagram.

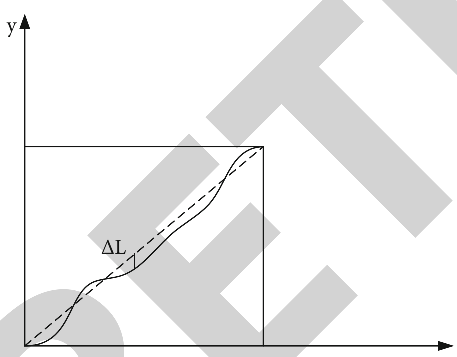

FIGURE 5: Schematic diagram of sensor linearity.

It can be seen from this formula that the larger the value of S, the higher the sensitivity of the sensor. The sensitivity of the linear sensor is a constant, and the sensitivity of the nonlinear sensor is changing at any time.

3.1.3. Hysteresis. Hysteresis refers to the phenomenon that the curves when the input is increasing and when the input is decreasing are not coincident. For the same input semaphore, the output from large to small and from small to large is different. The difference between the two is called the hysteresis difference and is represented by $\Delta H_{\max}$. The hysteresis error is expressed as

$$\gamma_H = \frac{\Delta H_{\max}}{Y_{\mathrm{FS}}} \times 100\%. \tag{8}$$

The hysteresis of the sensor is mainly caused by the physical characteristics of the sensor or the damage of its components.

3.1.4. Repeatability. The hysteresis is the inconsistency of the curves of the positive and negative strokes of the input quantity, and the repeatability error is the degree of inconsistency of the curves of the same stroke when the input quantity changes many times. The repeatability error can be expressed as the ratio of the maximum difference between the forward and reverse strokes to the full-scale output value.

$$\gamma_R = \pm \frac{\Delta R_{\max}}{Y_{\mathrm{FS}}} \times 100\%, \tag{9}$$

where $\Delta R_{\max}$ means the output maximum repeatability error.

3.1.5. Drift. Drift means that the input quantity does not change, but with the passage of time, the output quantity will change. One of the reasons for this is the change in the structure of the sensor itself. On the other hand, when measuring, it changes in the surrounding environment, such as the temperature and humidity of the surrounding environment. The temperature drift is generally expressed by the following formula:

$$\mathrm{TC} = \frac{y_t - y_{20}}{Y_{\mathrm{FS}} \bullet \Delta \mathrm{t}} \times 100\%. \quad (10)$$

In the formula, y_t is the output when the temperature is t, y_{20} is the output when the temperature is 20°C, and Δt is the difference between the temperature t and 20°C.

The dynamic characteristic of the sensor refers to the change of the output power with time, that is, the time relationship between the output power and the input quantity [11]. Because of its own structure and other factors, the output of the sensor cannot change in time with the change of the input, and there will be a certain delay in the middle. For a sensor with better dynamic characteristics, its output will reproduce the change law of the input quantity. To be precise, for ideal dynamic characteristics, the time function of the output quantity and the time function of the input quantity are different. The difference between these is the dynamic error [12].

The dynamic formula of the sensor is as follows:

$$a_n \frac{d^n y}{dt^n} + a_{n-1} \frac{d^{n-1} y}{dt^{n-1}} + \cdots + a_1 \frac{dy}{dt} + a_0 y = b_m \frac{d^m y}{dt^m} + b_{m-1} \frac{d^{m-1} y}{dt^{m-1}} + \cdots + b_1 \frac{dy}{dt} + b_0 x, \quad (11)$$

where x is the input quantity, y is the output quantity, and a_0, a_1,…, a_n and b_0, b,…, b_m are the parameters related to the sensor.

The dynamic characteristics of the sensor are not only related to the structure of the sensor itself but also related to the transformation method of the input quantity of the sensor. For different variations of the input, the variations of the output are different.

Sensors have many different properties and applications. In the same measured object, different transformation principles can be used to measure. And under the same principle, it can design different sensors according to the same principle. It is divided into physical sensors and complex sensors according to the working principle. The definition of physical sensors is based on physical principles [13]. According to the power supply mode of the power system, there are passive sensors and active sensors. Passive sensors are an energy conversion type that do not require an external power supply, while active sensors require an external power supply. According to its operation mechanism, it can be divided into piezoelectric sensor, photoelectric sensor, gas-electric sensor, and so on. Depending on the principle, the range is also different; for example, piezoelectric sensors include acceleration, pressure, and gas-electric sensors. Depending on the application, there are sensors for strength, temperature, humidity, sound sensitivity, and biology, as shown in Table 1.

It takes displacement sensor as an example to study its geometric measurement. According to the different mathematical models, displacement sensors are mainly divided into two categories. The first type is grid sensor, and its mathematical model is

$$x = \int v dt = \int \frac{dx}{dt} dt = \int dx = \sum \Delta x. \quad (12)$$

It takes the spatial grating distance x as the measurement benchmark and then accumulates and sums it to obtain the total displacement. The finer the grating distance x is, the higher the resolution. Through infinite accumulation, a “high resolution, large range” displacement sensor can be formed [14].

The second type is modulation. The measurement principle is to modulate the displacement x into a sinusoidal electrical signal with W as the space period within a certain distance W. It realizes the measurement of the displacement x_i within W by the amplitude or phase of the sinusoidal electrical signal. Its measurement model has the form of amplitude discrimination as shown in formula (12) and the form of phase discrimination as shown in formula (13).

Fragmentation form:

$$U_1 = A_1 \sin \frac{2\pi x_1}{W}. \quad (13)$$

Phase identification form:

$$U_2 = A_2 \sin \left(wt + \frac{2\pi x_1}{W} \right). \quad (14)$$

This type of sensor modulates the displacement x into the sinusoidal electrical signal by designing the electromechanical structural form of the sinusoidal electrical signal related to the displacement x [15]. The measurement accuracy depends on the quality of the sinusoidal signal and the accuracy of the pole distance W.

In the natural division of space,

$$x = \Delta x = \lambda. \quad (15)$$

In the formula, λ is the wavelength of the light wave.

In artificial equalization,

$$x = \sum \Delta x, \quad (16)$$

$$\acute{x} = \sum W + x_i. \quad (17)$$

Formula (15) is a measurement for fine scribes, and formula (16) is a measurement for coarse scribes. The former is directly used as a measurement reference x, and the latter is used as a pole W for generating a sine wave.

In the natural division of time,

$$\begin{gathered} \Delta x = V \Delta t, \\ x = \sum \Delta x = V \sum \Delta t. \end{gathered} \quad (18)$$

In the formula, V is the uniform motion, and t is the scanning time difference.

3.2. Public Health Care Services. Medical service is a kind of service in which medical institutions provide patients with

Table 1: Classification of sensors.

Classification	Type
Working mechanism	Physical property sensor, compound sensor
Circuit power supply	Passive sensor, active sensor
Basic principle	Piezoelectric sensor, photoelectric sensor, and pneumatic sensor
Common use	Force sensor, temperature sensor, and humidity sensor

services such as diagnosis, treatment, provision of medicines, medical equipment, and ward housing. The scope and standards of the current medical and health service system are formulated according to the actual situation of China's social and economic development [16]. The public medical and health service system is a new type of medical and health service that takes the country as a unit, provides public health services free of charge to all, and charges fees. It is a higher-level institutional arrangement. It adapts to the development of society and the people's needs for medical care. From the perspective of the content of medical security, medical security includes public health, medical service supply, drug supply, and medical security. Formally, the basic medical insurance system does not require everyone to bear public health expenditures, but to bear the costs of basic medical services.

The main content of the basic medical and health system is "four beams and eight pillars," that is, "basic medical services for the whole people." It includes four major systems of public health, medical services, and medical security, as well as institutional support in 8 aspects of management, supervision, operation, investment, information, legal system, price, and scientific and technological talents. The structure diagram of four beams and eight columns is shown in Figure 6. "Four beams and eight pillars" is the basic framework of the basic medical security system. It is the basic requirement to ensure the safety, effectiveness, convenience, and quality of basic medical services [17]. "Four beams and eight columns" are relatively independent, closely linked, complementary, and indispensable. The components work together to achieve universal basic health care. Without the support of "four beams and eight pillars," it is impossible for basic medical services to be shared by the whole people. In the process of promoting reform, we must take the "four beams" as the basic guarantee, the "eight pillars" as the foundation, and the "universal basic medical care" as the guarantee [18].

The public medical and health system refers to the government's allocation and redistribution of limited medical resources to achieve social justice and justice. To improve the health of the whole people requires that every citizen can equally enjoy basic medical and health services. Through the realization of basic medical services for the whole people, the rational allocation of social resources can be realized, and the imbalance caused by distribution according to work and market mechanism can be compensated. This reduces health inequities and promotes sustainable and stable social and economic development. The basic medical service system is to reallocate social resources through the government's taxation, financial transfer, and other means. It addresses the basic health needs of socially disadvantaged groups in remote and poverty-stricken areas and unable to find employment. This will narrow the difference in people's ability to obtain health caused by the gap between the rich and the poor, coordinate social disharmony factors, and reduce social conflicts [19].

With the development of economy, people's living standards are constantly improving. They are also increasingly concerned about their physical condition. The total cost of health care is increasing every year, from 1,988.039 billion yuan in 2010 to 4,097.464 billion yuan in 2015, with an increase of 2,109.425 billion yuan, as shown in Table 2. Government medical expenses increased from 573.249 billion yuan in 2010 to 1,247.528 billion yuan in 2015, with a year-on-year increase of 674.279 billion yuan. Social medical expenses increased from 719.661 billion yuan in 2010 to 1,650.671 billion yuan in 2015, with a year-on-year increase of 931.010 billion yuan. This shows that the government is paying more and more attention to health, and the proportion of medical expenses is increasing year by year. The government has formulated a series of health protection policies to promote the development of medical and health care in China.

But at the same time, there are unreasonable problems in the allocation of medical resources in China, which results in inefficiency of medical services. The distribution of medical resources between urban and rural areas and regions is unbalanced, especially the gap between urban and rural areas. China's rural population has the largest population, but it enjoys relatively few health resources. It is mainly manifested as follows: backward basic medical facilities, backward equipment, lack of specialized medical personnel, medical and health services, and resources cannot meet the medical needs of rural residents.

China is a region where the rural population accounts for 75% of the country's population. Its health resources are very scarce, and there is a clear gap between urban and rural medical technology levels. More than 80% of urban medical resources are concentrated in large- and medium-sized hospitals. Most of the hospitals are located in the eastern and central regions, with relatively few primary medical resources. The medical resources are in an "inverted pyramid" type. The total assets of hospitals at all levels are about five times that of primary medical institutions. Even at the highest level, community health institutions had only 3.6% of assets [20]. Although the new medical reform plan clearly puts forward the basic principle of taking primary medical services as the basic guarantee, the proportion of the total assets is still low. At the same time, the overall level of China's medical and health services is uneven. There is still a certain gap between the current level of medical services and medical equipment and the medical needs of residents.

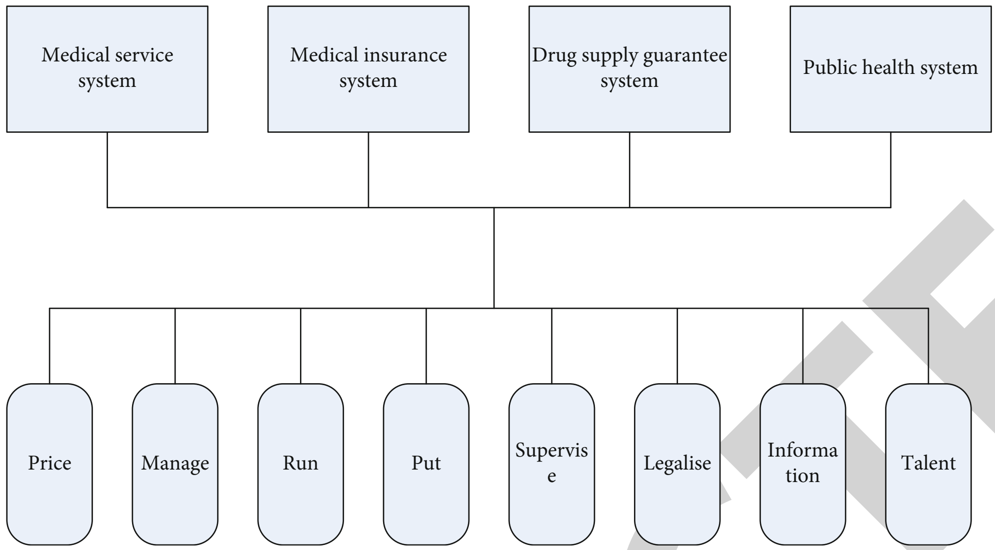

Figure 6: Contents of the basic medical and health system.

Table 2: Medical and health expenses in China from 2010 to 2015.

Time	Total cost (billion yuan)	Government spending (billion yuan)	Social spending (billion yuan)
2010	19880.39	5732.49	7196.61
2011	24345.91	7464.18	8416.45
2012	28119.00	8431.98	10030.70
2013	31668.95	9545.81	11393.79
2014	35312.40	10579.23	13437.75
2015	40974.64	12475.28	16506.71

Tables 3 and 4, respectively, show the distribution of medical and health care structures in various regions in China in 2015 and the per capita medical and health expenses in urban and rural areas from 2010 to 2015.

As can be seen from Table 3, compared with the central and western regions, the total number of medical institutions in the eastern region is the largest. The number was 333,593, accounting for 36.23% of the total number of medical institutions. The number of medical staff and diagnosis and treatment was also the largest, with 1,462,900 and 2,089.77 million visits, respectively. Medical and health resources such as health technicians are also concentrated in the eastern region. The total number of medical institutions, the number of medical staff, and the number of patients in the central and western regions lag behind those in the eastern region. It shows that there are significant differences in the distribution of medical and health care in China between regions.

As can be seen from Table 4, the per capita medical and health costs in rural areas are far lower than the per capita medical and health costs in urban areas. However, both are increasing year by year, and the gap between the two is constantly narrowing. From 3.47 times to 2.56 times, the per capita medical and health expenses reflect people's investment in medical and health care. The quality and cost of medical and health services in rural areas lag behind urban areas. This shows that there are also significant differences in the distribution of medical and health care between urban and rural areas in the country.

In the market requirements in recent years, the primary task for the sustainable development of medical and health care is to distribute medical resources in a balanced manner and improve the level of medical services, which cannot be achieved in the short term. Whether the distribution of medical resources is balanced or not has a very critical role and value in the process of promoting the fairness of medical resources. This is also related to whether the great goal of national health can be achieved. In general, China's basic medical and health system has not only structural problems such as mismatch of supply and demand structure, imperfect service structure, and unbalanced interest structure but also specific problems in the operation of the system.

And the reality is that institutions and structures are symbiotic throughout the health care system. For example, the contradiction of the structural deviation of medical resources between different regions generally seems to be a contradiction caused by structural problems, but in fact, the occurrence of this contradiction is also closely related to the imperfect medical system. Therefore, to alleviate the structural contradictions in the medical and health services, in addition to the macrocontrol of the government and the strengthening of the supply of medical resources in backward areas, it is also necessary to start from the fundamentals of the establishment of the system.

4. Experimental Research on Public Medical and Health Services Based on 5G Sensor Technology

It takes H hospital and its direct management W community health service center as the experimental object. H hospital is a comprehensive hospital integrating medical treatment, teaching, scientific research, prevention, and health care in Wangcheng District, Changsha. It has 800 beds, 1,582,800

Table 3: China's medical and health structure by region in 2015.

Area	Number of institutions	Number of medical staff	Number of visits (10,000 people)
Total	920770	3603162	434193
East	333593	1462900	208977
Central	296328	1129070	122103
West	290849	1011192	103113

Table 4: China's urban and rural per capita health care costs from 2010 to 2015.

Time	Urban per capita health costs (yuan)	Rural per capita health costs (yuan)
2010	2315.48	666.30
2011	2697.48	879.44
2012	2999.28	1064.83
2013	3234.12	1274.44
2014	3558.31	1412.21
2015	3917.42	1527.36

outpatient visits in 20 years, and 226,000 discharged patients every year. There are 33 first-level diagnosis and treatment subjects and 52 second-level diagnosis and treatment subjects. The hospital has 1,240 employees and 78 senior technicians. At present, the hospital has a national key medical center and a number of key disciplines.

The W community health service center was originally a branch of the F hospital, with a service area of 25 square kilometers. It has a total of 21 communities with 8 community health service stations serving a population of 78,033 people. The center has 3,540 square meters of office space and 4,803 square meters of commercial space. There are currently 128 employees and 106 professional and technical personnel. It has 100 beds and is a designated unit for municipal medical insurance.

It explores the impact of 5G sensor technology on public medical and health services through experimental research on existing public medical and health services and the use of 5G sensor technology in the back H hospital. This includes the following four aspects: bed occupancy rate, number of inpatients and discharges, outpatient and emergency department volumes, and average cost of inpatients. The results of the study are shown in the following figures.

4.1. The Utilization Rate of Beds. Figure 7(a) shows the bed occupancy rate of hospital H within one year in the existing public medical and health services.

Figure 7(b) shows the bed occupancy rate in hospital H within one year after adopting 5G sensor technology.

As can be seen from Figure 7, the average bed occupancy rate of the H hospital in the existing public health department is 81.8% within one year. Among them, the occupancy rate of beds was the largest from October to December, at 84.9%. From January to March, the bed occupancy rate was 82.31%. The bed occupancy rates in the two quarters of April to June and July to September were relatively small, at 79.53% and 80.46%, respectively. After adopting 5G sensor technology, it was found that the average bed occupancy rate of H hospital within one year was 88.71%; the bed occupancy rate was the largest from October to December, which was 84.9%; the bed occupancy rates in other quarters were 89.27%, 88.4%, and 84.62%, respectively. These all meet the evaluation standards of the hospital bed occupancy rate of the Ministry of Health (84%~93%). It was found that the utilization rate of wards in hospital H after adopting 5G sensor technology was higher than that of the existing system.

4.2. The Number of Inpatients and Discharges. Figure 8(a) shows the number of inpatients and discharges in hospital H within one year in the existing public medical and health services.

Figure 8(b) shows the number of inpatients and discharges in hospital H within one year after adopting 5G sensor technology.

As can be seen from Figure 8, the total number of hospitalizations in hospital H in one year in the existing public health care system is 9.601 million. Among them, the number of hospitalizations from October to December was the largest, reaching 2.871 million. The total number of hospital discharges in one year was 7.495 million, corresponding to the highest number of discharges in the fourth quarter with 2.12 million. In the existing public medical and health system, the proportion of hospital discharges within one year was 78.06%. It was found that after adopting 5G sensor technology, the total number of hospitalizations in hospital H within one year was 9.845 million. Among them, the number of hospitalizations from October to December was the largest, reaching 2.851 million. The total number of hospital discharges in one year was 8.668 million, and the fourth quarter also saw the highest number of discharges at 2.471 million. It was found that after the adoption of 5G sensor technology, the proportion of hospital discharges within one year of hospital H was 88.04%, which was much higher than that of the existing system.

4.3. The Number of Outpatients and Emergency Department. Figure 9(a) shows the number of outpatients and emergencies in hospital H within one year in the existing public medical and health services.

Figure 9(b) shows the number of outpatients and emergencies in hospital H within one year after using 5G sensor technology.

As can be seen from Figure 9, the total number of outpatient visits in hospital H in one year in the existing public health care system is 42.197 million. Among them, the number of outpatient visits from October to December was the largest, reaching 11.429 million. The total number of emergency visits in one year was 7.807 million, of which the number of emergency visits from April to June was the largest at 2.107 million. It was found that after adopting 5G sensor technology, the total number of outpatient visits in hospital H within one year was 44.259 million. Among them, the number of outpatient visits from January to March was the largest, reaching 11.752 million. The total number of emergency visits in one year was 7.694 million. Among them, the number of

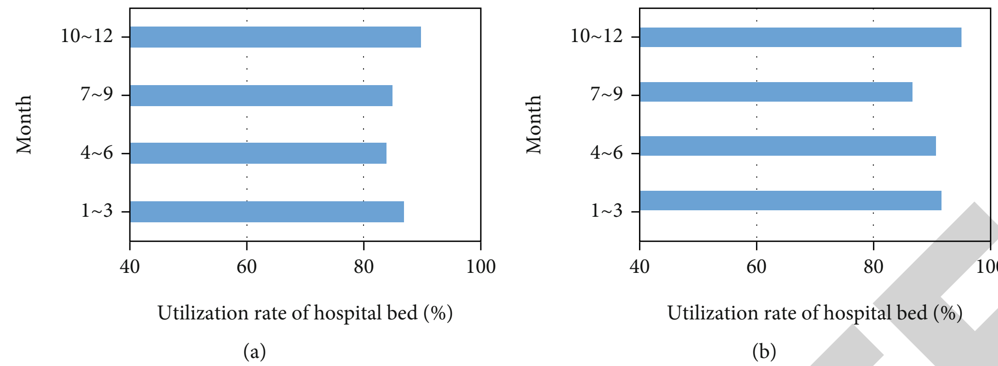

Figure 7: The graph of the utilization rate of hospital beds in hospital F.

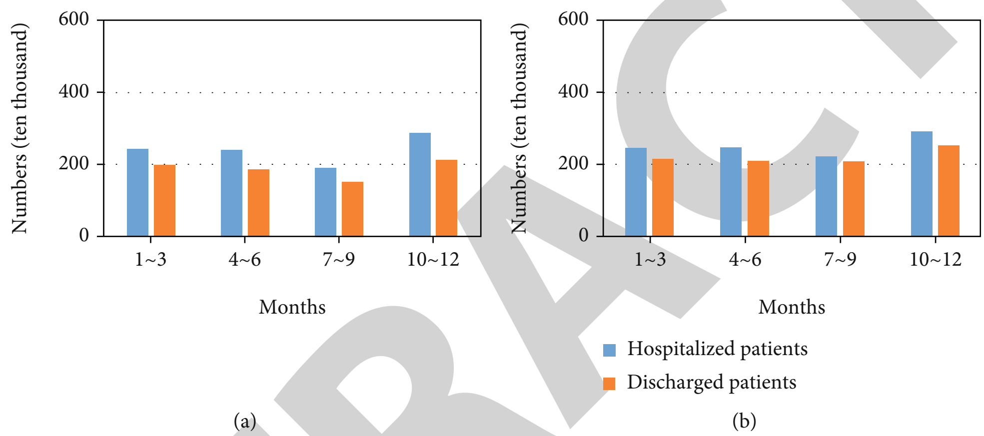

Figure 8: The graph of hospitalized and discharged patient number in hospital F.

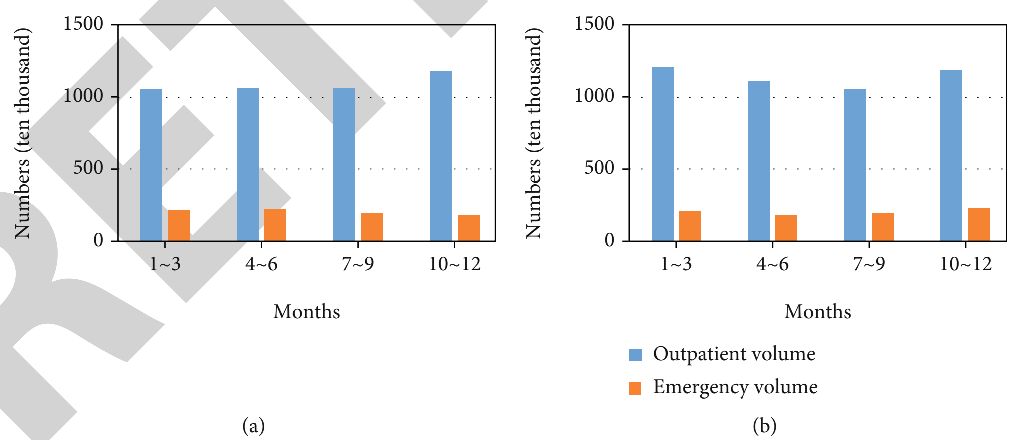

Figure 9: The graph of outpatient and emergency visits in hospital F.

emergency department visits from October to December was the largest, at 2.146 million. It was found that after adopting 5G sensor technology, the total outpatient volume growth rate of H hospital within one year was 4.89%, while the total emergency department volume decreased by 1.45%.

4.4. Average Cost of Inpatients. Figure 10(a) shows the per capita cost of inpatients in hospital H within one year.

Figure 10(b) shows the per capita cost of inpatients in center W within one year.

It can be seen from Figure 10 that in the existing system, the per capita cost of inpatients in hospital H within one year is 17,805.75 yuan. After adopting 5G sensor technology, the per capita cost of inpatients in the H hospital within one year is 15,840 yuan. Compared with the existing system, the per capita cost is reduced by 11.04%. In the existing system,

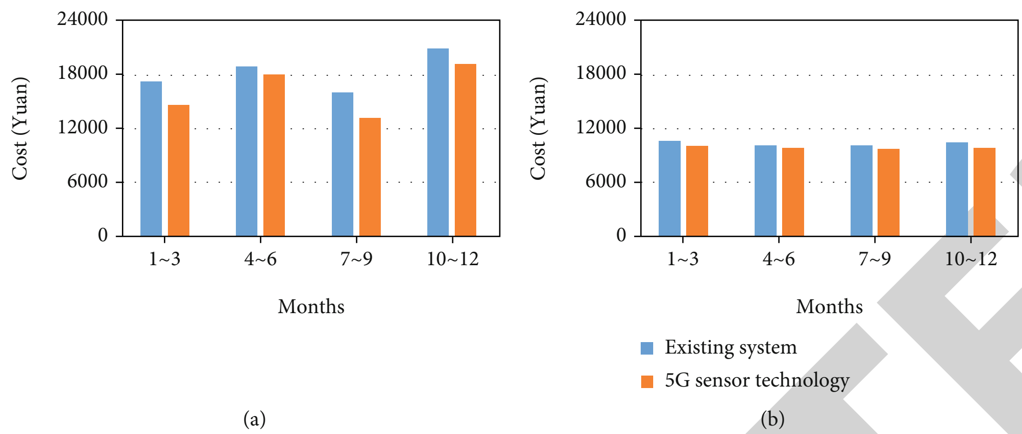

Figure 10: The graph of per capita cost of inpatients in hospital F and health center W.

the per capita cost of inpatients in the W center within one year is 10,131.5 yuan. After adopting 5G sensor technology, the per capita cost of inpatients in W center within one year is 9,661.75 yuan. Compared with the existing system, the per capita cost is reduced by 4.64%.

5. Conclusion

In the experimental part, this paper analyzes the effectiveness of hospital H and community health center W using 5G sensor technology in promoting the rational flow of patients, ensuring the quality of medical services, and improving service efficiency. It can be seen that the use of 5G sensor technology can improve the medical environment, optimize the personnel structure, and enhance service capabilities. For large hospitals, through the use of sensor information technology, the turnover rate of hospital beds has increased, and the efficiency of medical operations has been improved. It can focus on the rescue of critically ill patients and the construction of important disciplines. At the same time, the tentacles of the hospital business were extended to the grassroot level, which increased the brand influence of the hospital. At the same time, for the community health service center, it can also achieve professional use of public resources, thereby improving the operating efficiency of the hospital itself. Through the corresponding reform of the medical system, the effect of reasonable cost control is more significant. This can reduce unnecessary medical behavior, improve the utilization rate of public medical resources, and strengthen the specialization of labor. Through the combination of theoretical research and experimental analysis, this paper uses 5G sensor technology to conduct research on medical and health public services. It launched a more comprehensive discussion on China's basic medical and health service system. It hopes to provide a reference basis for the long-term development of China's basic medical care system and the further reform of its social medical security system. Of course, there are still some flaws in this paper. The basic health care system covers political science, philosophy, economics, sociology, and clinical medicine and other professional disciplines. Therefore, the understanding and expansion of the related concepts in this paper need to be further improved. In addition, the practical operability of 5G sensor technology in medical and health services also urgently needs more in-depth systematic research.

Data Availability

No data were used to support this study.

Conflicts of Interest

This paper has no potential competing interests.

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