

# Analysis of Supply and Demand Causes of "Difficult to See a Doctor" on the Medical Service Supply Side in China

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## Abstract

By using logical analysis and quantitative research, this paper analyzes the supply-demand response and the relevant statistical data of medical services from the perspective of supply side. The excessive demand of patients for specific medical services, and the imbalance of the supply structure of medical services in hospitals of different grades, property rights and regions must account for the "difficulty in seeing a doctor". The imbalance of the supply structure of medical services is the fundamental reason for the difficulty of seeing a doctor and optimizing the supply side of medical services can alleviate this problem.

## Keywords

Difficulties in seeing a doctor; Demand of medical services; Supply of medical services; Supply side.

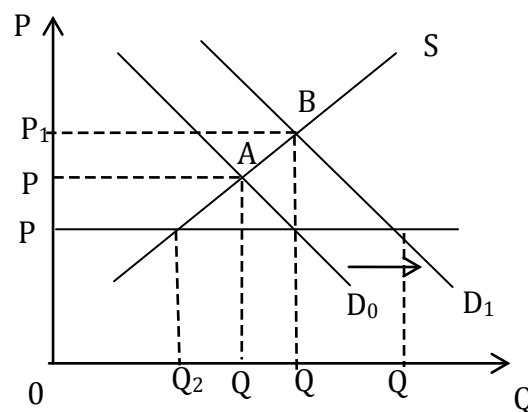
## 1. Introduction

People's demand for health and medical services increases with the change of population structure and the improvement of residents' living standards. In October 2016, the State Council stressed the importance of people's health in the outline of "healthy China 2030" plan, and proposed the strategic task of optimizing health services. The phenomenon of "difficult to see a doctor" has always been one of the common problems in the health development of Chinese residents, and the medical service supply side provides a new perspective for health and health development. Analyzing the causes of the "difficult to see a doctor" phenomenon from the perspective of supply and demand can guide the government to balance the supply of medical services and improve the quality and efficiency of the supply of medical and health services.

## 2. Theoretical Analysis of Supply and Demand of "Difficult to See a Doctor"

### 2.1. Excessive Demand Leads to "Difficult to See a Doctor"

Excessive demand for medical services, that is, a demand situation where the needs of patients exceed the level that medical institutions can provide or are willing to provide, and hospitals are overloaded, resulting in waste of resources. When supply and demand do not match, market prices will adjust themselves to restore balance between supply and demand. The Chinese government has imposed price controls on medical services and has set a maximum price. The government stipulates that the price of medical services must not exceed a certain level [1]. Due to the purpose of price control and the degree of information control, the maximum price for medical services is generally lower than the free market price [2]. The maximum price lower than the equilibrium price prevents the price from adjusting the supply and demand, resulting in the inability to effectively allocate medical service resources. To explore the changes in the medical service demand curve when the supply is constant, draw [Figure 1](#), and plot the medical service ceiling price  $P_2$  below the equilibrium points A and B.

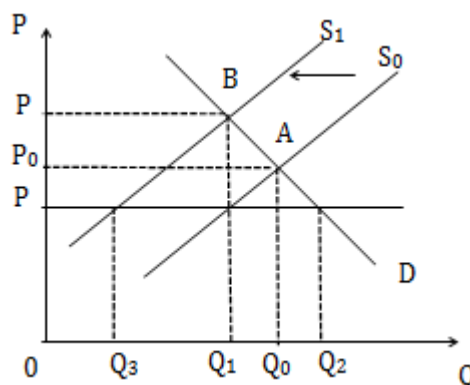


**Figure 1:** Medical service demand curve

As shown in the figure, when the demand curve is  $D_0$  and the government price limit is  $P_2$ , the supply of medical services is  $Q_2$  and the demand is  $Q_1$ . Compared with point A of supply-demand equilibrium, the supply decreased by  $Q_0 - Q_2$ , the demand increased by  $Q_1 - Q_0$ , and the gap between supply and demand of medical services is  $Q_1 - Q_2$ . When consumer demand increases, the demand curve moves from  $D_0$  to  $D_1$ , and the equilibrium point moves from A to B. At this time, the equilibrium price increases from  $P_0$  to  $P_1$ , and the equilibrium quantity of supply and demand increases from  $Q_0$  to  $Q_1$ . In the case of the government setting a ceiling price of  $P_2$ , the demand increased to  $Q_3$ , which leads to a further expansion of the supply and demand gap to  $Q_3 - Q_2$ . Therefore, under the condition of the government's highest price limit, excessive medical service demand will further aggravate the imbalance between supply and demand, resulting in the phenomenon of "difficult to see a doctor".

**2.2. Insufficient Effective Supply Leads to "Difficult to See a Doctor"**

Insufficient effective supply of medical services, that is, the quantity and structure of medical service supply do not match the multi-level and diversified consumer needs of patients. The medical service supplier holds absolute information in the medical service market and is in a monopolistic competitive position. Its supply directly affects the price and demand of medical services. The government implements price control, but it does not bear the cost of the hospital's human resources, equipment updates, and technological product innovation, which has caused the hospital to reduce the supply of medical services. The low quality of medical services (such as bad attitude, long queue, high search cost, etc.) is also a manifestation of insufficient medical service supply [3]. To explore the changes in the medical service supply curve when demand remains unchanged, draw [Figure 2](#) and plot the maximum medical service price  $P_2$  below the equilibrium points A and B.

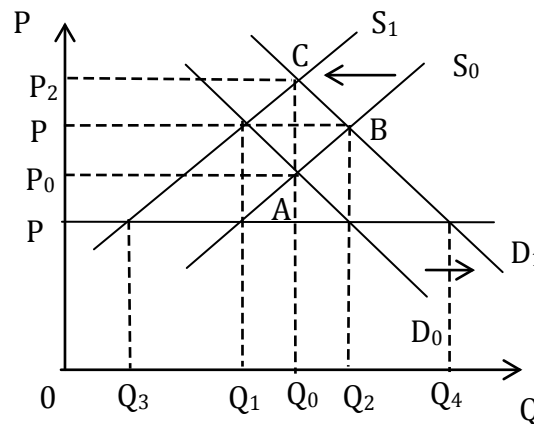


**Figure 2:** Medical service supply curve

When the supply curve is  $S_0$  and the government price limit is  $P_2$ , the demand for medical services is  $Q_2$ , and the market supply is  $Q_1$ . Compared with point A, where supply and demand are balanced, supply decreases by  $Q_0-Q_1$ , demand increases by  $Q_2-Q_0$ , and the gap between supply and demand for medical services is  $Q_2-Q_1$ . When the effective supply of medical services is insufficient, the supply curve moves from  $S_0$  to  $S_1$ , and the equilibrium point changes from a to b. At this time, the equilibrium quantity decreased from  $Q_0$  to  $Q_1$ , and the equilibrium price increased from  $P_0$  to  $P_1$ . With the government's ceiling price at  $P_2$ , the supply of medical services is reduced to  $Q_3$ , and the gap between supply and demand is further expanded to  $Q_2-Q_3$ . Therefore, under the condition of the government's highest price limit, the insufficient supply of effective medical services will make the gap between supply and demand larger, resulting in a "difficult to see a doctor" phenomenon.

**2.3. Excessive Demand and Insufficient Supply Coexist Leading to "Difficult to See a Doctor"**

The theory of supply and demand balance means that any kind of commodity can achieve the balance of supply and demand through price adjustment [4]. The supply and demand of medical services are often difficult to balance in actual life. The demand of patients continues to expand and the supply of medical institutions cannot keep up with the changes in demand. The excessive demand and insufficient supply of medical services coexist to create an imbalance, which eventually leads to "difficult medical treatment." In order to discuss the changes in supply and demand, draw Figure 3.



**Figure 3:** Medical service supply and demand curve

Suppose the initial medical service supply curve is  $S_0$ , the demand curve is  $D_0$ , and the government's maximum price is  $P_3$ , as shown in Figure 3. First of all, when the price is  $P_3$ , the demand is  $Q_2$  and the supply is  $Q_1$ . At this time, the gap between the supply and demand of medical services is  $Q_2-Q_1$ . Secondly, as the demand for medical services grows rapidly, the demand curve moves from  $D_0$  to  $D_1$ , and the equilibrium point moves from point A to point B. In the case where the government price limit is  $P_3$ , the medical service supply and demand gap is  $Q_4-Q_1$ . It can be seen that the excessive demand for medical services has further increased the gap between supply and demand by  $Q_4-Q_2$ . Finally, as the supply of medical services decreases, the supply curve moves from  $S_0$  to  $S_1$ , and the equilibrium point moves from point B to point C. In the case where the government price limit is  $P_3$ , the medical service supply and demand gap is  $Q_4-Q_3$ . It can be seen that the insufficient supply of medical services has further increased the gap between supply and demand by  $Q_1-Q_3$ . In general, the equilibrium point changes from point A to point C after two changes. The equilibrium price  $P_2$  at point C is higher than the equilibrium price  $P_0$  at point A, and the gap between supply and

demand is greater. From the above analysis, it can be seen that the coexistence of excessive demand for medical services and insufficient effective supply will lead to a further expansion of the gap between supply and demand, causing a more serious "difficult to see a doctor" phenomenon.

### 3. The Direct Cause of "Difficult to See a Doctor": Excessive Demand

#### 3.1. Excessive Demand for Outpatient

The difficulty of seeing a doctor is mainly reflected in the difficulties of patient registration and hospitalization. Therefore, from the perspective of outpatient needs and hospitalization needs, the main reasons for "difficult to see a doctor" are discussed. According to the data from the China Health Statistics Yearbook, the number of outpatient visits of medical institutions at various levels is drawn into a line chart, as shown in [Figure 4](#). It can be seen from the figure that public hospitals have the highest number of diagnosis and treatment, and they differ greatly from private hospitals.

Tertiary hospitals have the second highest number of diagnosis and treatment, and the number of diagnosis and treatment in secondary and primary hospitals decreased accordingly. Specifically, the number of medical treatments in tertiary hospitals and public hospitals is significantly higher than that in other hospitals, and People tend to seek medical treatment in high-level public hospitals. Although the number of hospital visits in various hospitals is increasing year by year, the number of hospital visits in tertiary hospitals is rising fastest, and there is little change in primary hospitals.

At present, most patients do not have a high degree of awareness of graded diagnosis and treatment. The medical treatment of a top three hospital shows that about 40% of the outpatients of this hospital are common diseases every year [5]. It can be seen that the excessive demand of outpatient clinics is mainly concentrated in specific medical institutions. Consumers are more willing to go to large hospitals and urban hospitals for medical treatment, but lack trust in primary medical institutions. The overlapping needs of severely ill patients and ordinary patients make the demand excessive, and the disorder of ordinary patients' medical treatment is the direct cause of "difficult to see a doctor".

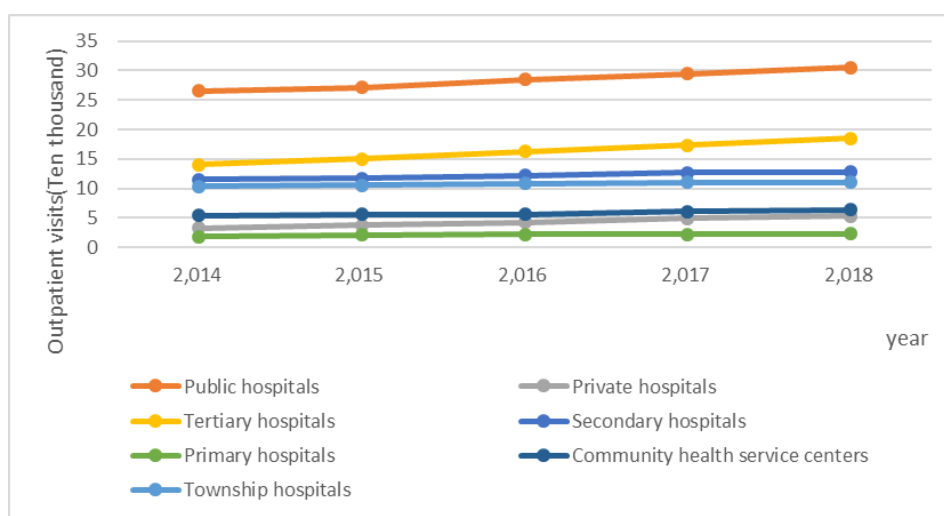


Figure 4: Number of outpatient visits by medical institutions in 2014-2018

#### 3.2. Excessive Demand for Hospitalization

According to the data of China Health Statistics Yearbook, plot the utilization rate of hospital beds at various levels into a line chart, as shown in [Figure 5](#). It can be seen from the figure that

the utilization rate of beds in the tertiary hospitals is the highest, followed by the public hospitals and the secondary hospitals. The bed usage rate of private hospitals, township health centers, and primary hospitals is close to and successively decreasing, and the bed utilization rate of community health service centers is the lowest. In general, the bed utilization rate of primary medical institutions such as primary hospitals, community health service centers, and township health centers is significantly lower than that of secondary hospitals and tertiary hospitals. Basic-level medical organizations are rarely trusted by patients, and the annual bed utilization rate can hardly exceed 60%. The low bed utilization rate indicates that the medical service has potential and has not been fully realized. In contrast, the utilization rate of hospital beds in tertiary hospitals is too high, indicating that the usage rate of hospital beds is too heavy and there is not enough space to serve patients. Thus, the excessive demand of patients for medical services in high-level urban hospitals is the direct cause of the "difficult to see a doctor" phenomenon.

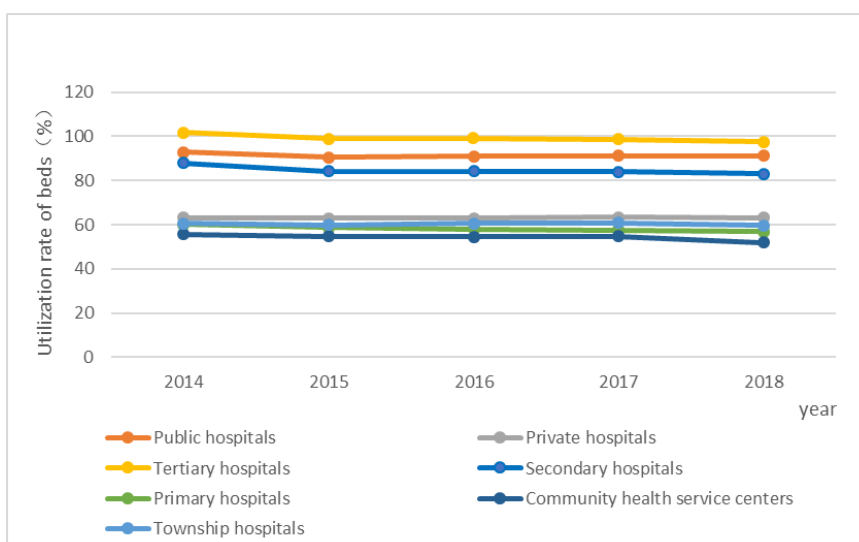


Figure 5: Utilization rate of beds in medical institutions in 2014-2018

#### 4. The Deep Reason of "Difficult to See a Doctor": Structural Supply Imbalance

##### 4.1. Structural Imbalance of Primary, Secondary and Tertiary Hospitals

China's public hospitals are divided into three levels. Different levels of medical institutions have different medical service supply capabilities, and the overall allocation of medical resources presents an "inverted triangle" pattern [6]. Relevant data were obtained from China Health Statistical Yearbook, and Table 1 was gained through calculation. It can be seen from the table that the number of tertiary hospitals is the least, but the average number of beds and the average number of health workers far exceeds the number of primary and secondary hospitals. Although the number of primary hospitals is the largest, the number of beds and the number of health workers are the least. Tertiary hospitals have an absolute advantage in the supply of medical services and the construction and development of human resources, and there is a large gap between tertiary hospitals and secondary hospitals and primary hospitals. The inverted triangle structure of medical service supply shows that the supply structure of medical service in China is out of balance, especially the 3A grade hospitals. Although the number of 3A grade hospitals is limited, they have a large number of medical and health resources and have long been in a monopoly position in the medical service supply market. Due to the lack of competitive pressure, it is difficult to improve the work efficiency. At the

same time, the development scale of primary hospitals in China is limited. Patients who really need prevention and health care are unwilling to go to primary hospitals for treatment, which makes it difficult to effectively utilize the medical service resources and thus reducing the supply of medical services in primary medical institutions. The treatment of medical staff at different levels is also different. The salary of medical staff in primary hospitals is generally lower than that of secondary and tertiary hospitals, resulting in a small number of medical staff in primary hospitals, and low educational level and technical ability [7].

From the above analysis, it can be seen that the unbalanced supply structure among primary, secondary and tertiary hospitals in China has caused the shortage of the quantity and quality of medical services in low-level hospitals, and has caused huge pressure on diagnosis and treatment for high-level hospitals. The structural imbalance between different levels of hospitals is the underlying cause of the difficulty in seeing a doctor.

**Table 1:** Health supply of China's primary, secondary, and tertiary hospitals from 2014 to 2018

year	Number of hospitals			Average number of beds			Average number of health personnel		
	tertiary	secondary	primary	tertiary	secondary	primary	tertiary	secondary	primary
2014	1954	6850	7009	961.26	299.84	55.24	1248	336	54
2015	2123	7494	8757	964.58	293.13	55.03	1259	325	52
2016	2232	7944	9282	991.81	289.89	55.79	1272	329	51
2017	2340	8422	10050	1008.5	290.99	58.20	1287	332	53
2018	2548	9017	10831	1007.5	283.28	58.20	1317	309	51

#### 4.2. Structural Imbalance between Public and Private Hospitals

There is also a phenomenon of unbalanced supply structure in public hospitals and private hospitals in China. Relevant data of public and private hospitals are obtained from China Health Statistics Yearbook, and [Table 2](#) is obtained through calculation. It can be seen from the table that the number of public hospitals in China has decreased year by year, and began to be smaller than the number of private hospitals in 2015. However, the average number of beds and the average number of health personnel in public hospitals are much higher than those of private hospitals, and the health supply of public hospitals is growing faster than private hospitals. The "Guiding Principles for the Planning of the Establishment of Medical Institutions (2016-2020)" issued by the National Health and Family Planning Commission pointed out that the number of public hospitals should be set reasonably and the scale of public hospital beds should be strictly controlled. Actual data shows that although the number of public hospitals has been controlled, the size of beds in public hospitals is still unreasonably expanded.

In recent years, China has vigorously promoted the reform of public hospitals and introduced various policies to encourage and support the development of private hospitals. However, these policies have not fundamentally solved the invisible barriers encountered by our country's social medical services in the medical field. Private hospitals are in a marginal position [8]. China's health personnel employment choices are more biased towards public hospitals, and public hospitals have more complete medical service supply and larger scale expansion. Due to insufficient government compensation for public hospitals, public hospitals blindly expand their scale in order to maintain their own development, which ultimately affects the medical service supply of private hospitals. The imbalance of supply structure between public and private hospitals makes the allocation of medical service resources inefficient, which leads to the phenomenon of "difficult to see a doctor".

**Table 2:** Health Supply of Public Hospitals and Private Hospitals in China from 2014 to 2018

year	Number of hospitals		Average number of beds		Average number of health personnel	
	public	private	public	private	public	private
2014	13314	12546	309.88	66.59	367	68
2015	13069	14518	328.75	71.23	390	71
2016	12708	16432	350.59	75.08	420	73
2017	12297	18759	376.61	79.39	451	76
2018	12032	20977	399.12	81.88	478	77

### 4.3. Structural Imbalance between Urban and Rural Medical Institutions

The distribution of medical resources between urban and rural areas is unreasonable In China. High quality medical and sanitation resources tend to gather in cities and developed areas with high purchasing power and population density. Medical services also focus on high-priced and high-profit treatment. Relevant data of urban and rural medical institutions are obtained from China Health Statistics Yearbook, as shown in Table 3. It can be seen from the table that the number of urban medical institutions in China is far less than the number of rural medical institutions, but the number of beds per thousand population and the number of health technicians per thousand population in urban medical institutions are about twice that of rural medical institutions. It shows that China's health personnel resources are concentrated in cities, the medical facilities of rural medical institutions are still lagging behind that of cities, and the structure of medical service supply is seriously biased towards cities.

At the same time, the data forecast shows that by 2030, the health resources per thousand people in cities will be three times that in rural areas [9]. The ratio of doctors to nurses in rural medical institutions is more disproportionate. Most hospitals in rural areas are dominated by doctors, few nurses, or even only one practicing physician [10]. The long-term urban-rural dual structure makes the rural medical institutions face the problems of resource shortage, talent bottleneck and so on. Rural medical institutions are unable to meet the needs of patients, which makes the medical service supply of urban hospitals face challenges. Therefore, the unbalanced supply structure of medical services in China's urban and rural areas, resulting in inadequate medical service supply is the underlying cause of "difficult to see a doctor".

**Table 3:** Health Supply of Urban and Rural Medical Institutions in China from 2014 to 2018

year	Number of hospitals		Number of beds per thousand population		Number of health technicians per thousand population	
	urban	rural	urban	rural	urban	rural
2014	156256	825176	7.84	3.54	9.70	3.77
2015	165484	818044	8.27	3.71	10.21	3.90
2016	172532	810862	8.41	3.91	10.42	4.08
2017	181983	804666	8.75	4.19	10.87	4.28
2018	196074	801359	8.70	4.56	10.91	4.63

## 5. Conclusion and Suggestion

The phenomenon of "difficult to see a doctor" in China is ostensibly caused by the patient's inability to meet the specific needs of high-level public hospitals. In fact, it is due to the imbalance of the supply side of medical services and the inability to distribute medical services quantitatively, resulting in an imbalance between supply and demand. In order to

alleviate the "difficult to see a doctor" phenomenon, the reform of the national medical and health system needs to continue to explore and innovate on the side of medical service supply, and improve the diversified medical pattern. On the one hand, government departments loosen price control, and the market price mechanism regulates supply and demand, improving the fairness of health input and the rationality of medical resource allocation; On the other hand, the high-level public hospitals reasonably expanded the scale to relieve the shortage of beds and the number of outpatient visits. At the same time, the government should improve the medical level of grassroots hospitals, establish a coordinated linkage with high-level hospitals, and carry out graded diagnosis and treatment to achieve patient diversion. Only by stimulating the vitality of the supply side of medical services can the effectiveness and flexibility of the supply of medical and health resources be improved and resource waste be reduced.

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