

Evaluation on Compensation Effect of Comprehensive Reform of Medical Prices in Different Types of Public Hospitals in Jiangxi Province

Xiaowen Wan^{1a}, Qiang Ma^{2b} and Shuwei Gu^{3c}

^{1,2,3} Jiangxi University of traditional Chinese medicine, China

^aE-mail:645479278@qq.com; ^bE-mail:2254482413@qq.com; ^cE-mail:2399931496@qq.com

Keywords: Public Hospitals; Medical Price Reform; Compensation Mechanism; Time Series Method

Abstract: Objective to evaluate the effect of different types of public hospitals in Nanchang after the reform of drug prices, and to provide empirical basis for eliminating the income compensation path of public hospitals after the drug bonus. Methods This paper analyzes the income and expenditure and compensation of three different representative public hospitals in Nanchang City before and after the reform by using the method of interval time series analysis. Result After the reform of service-dependent and drug-dependent hospitals, the proportion of drugs in outpatient and inpatient departments has decreased by about 8%-12%. The average cost of drugs for inpatients has decreased significantly. 23%-57%; after the total abolition of drug additions, the income of medical services and the average cost of treatment have increased; the proportion of total compensation in some hospitals is on the low side. Conclusion Different compensation schemes should be made for different types of hospitals to coordinate the implementation of relevant reform policies and schemes. At the same time, the government should do a good job in macro-control, establish a scientific and reasonable budget and dynamic compensation mechanism, and further rationally raise the price of medical services.

The comprehensive reform of public hospitals is an important part of the health system reform, and its effect determines the success or failure of the new reform to a great extent. In May 2015, the State Council General Office issued the guiding opinions on the pilot comprehensive reform of public hospitals in cities, calling on all public hospitals in the pilot cities to abolish the drug bonus (except for Chinese herbal pieces) and eliminate the undesirable mechanism of "supporting doctors with medicine", the loss caused by the hospital will be compensated by adjusting the price of medical service and increasing the government investment, so as to further control the increase of medical expenses[1]. In view of the current situation in Jiangxi Province, there are more scholars studying the influence of the comprehensive reform of drug prices on county-level public hospitals [2-3], but there are few relevant studies on the comprehensive reform of urban public hospitals, and the city public hospitals were not divided into different types of hospital research. Based on this, the study selected three different types of urban public hospitals in Jiangxi Province, after the comprehensive reform of drug prices and drug income compensation effect evaluation.

Data and Methods

Data Source. This paper selects three different types of city public hospitals in Jiangxi Province (represented by a hospital, B hospital and C hospital respectively) as representative cases to study, collection of hospital financial data from January 2016 to December 2017 revenue and expenditure situation analysis. At present, the sources of hospital income can be divided into general items, services and medicines. For example, Ma Aixia[4] classifies the subjects of study into three categories: First, representatives of General Hospitals; Second, the representatives of service-dependent hospitals, which are defined as "the medical service income accounts for a higher proportion of the overall hospital income, and there is more room for the service income to rise"; third, the representatives of drug-dependent hospitals, it is defined as "drug income accounts for a higher proportion of total hospital income". Based on the factors of convenience and consensus in

the process of data collation and analysis, and considering the reliability of further analysis, this paper studies the classification method. Among them, hospital a is the representative of the General Hospital, hospital B is the representative of the service-dependent Hospital, and hospital C is the representative of the drug-dependent Hospital.

Research Methods. variables and evaluation indicators, in order to better evaluate the implementation effect of the comprehensive reform of drug prices in three urban public hospitals, in this study, we evaluated the effect of the comprehensive reform of medicine price from the following three aspects: the proportion of medicine, the average cost of medicine, the proportion of Western medicine, the income of medical service, the average cost of treatment and the proportion of compensation. Among them: (1) medicine accounted for 100% of drug income / total medical income, (2) drug expenditure per visit, (3) western medicine accounted for 100% of western drug expenditure / total medical expenditure, (4) medical service income structure the proportion of various service items in medical service income, (5) average treatment cost treatment cost / number of visits.

In this study, "pre-reform" outcomes were the sum (or average) of the values for the first four months (as of May 2017 or August 2017) , the "post-reform projections" are the sum (or average) of the post-reform 4-month values based on data from the first 20 months of the reform (January 2016 -- August 2017) , the "post-reform real" results are the sum (or average) of the values of the post-reform four months (September 2017, December 2017) .

Results

Change of Drug Revenue and Expenditure. proportion of drugs. From Table 1, it can be seen that the proportion of drugs after the reform of B hospital is 30.66% , which is 9.81 percentage points lower than before the reform, and the proportion of drugs in c hospital is 34.27% , by 10.62 percentage points. Compared with B Hospital and C hospital, the proportion of all kinds of drugs increased rather than decreased after the reform of a hospital, the total proportion of drugs was 46.94% , up 11.79 percentage. On the one hand, it may be because hospital a belongs to a comprehensive type, with more comprehensive disease departments and more patients. On the other hand, because the time chosen before and after the reform is summer, Autumn and winter, such as acute tonsillitis, gastrointestinal disease, stroke and other seasonal, high incidence of such characteristics, the need for a large number of drugs to maintain life and health of drug-dependent diseases. Check its hospital departments, cardiovascular department, Department of Gastroenterology, Department of Respiratory Oncology and the majority of serious medicine. Comparing the outpatient and inpatient rates in three hospitals, it was found that the inpatient rate changed more than the outpatient rate.

Table 1. Proportion of drugs in three public hospitals before and after reform %

Hospital	Before reform	Post-reform forecast	Post-reform	Net change
Hospital A				
Outpatient	43.98	44.29	56.26	11.97
Be hospitalized	32.15	34.32	46.48	12.16
Total	33.92	35.15	46.94	11.79
Hospital B				
Outpatient	54.48	57.73	47.83	-9.9
Be hospitalized	29.38	33.74	21.5	-12.24
Total	38.19	40.47	30.66	-9.81
Hospital C				
Outpatient	43.21	46.76	38.71	-8.05
Be hospitalized	43.01	46.93	38	-8.93
Total	45.13	44.89	34.27	-10.62

Note: Net change = actual after reform-forecast after reform

Average Drug Costs Per Visit. As can be seen from Table 2, the net increase in drug revenue and the net increase in the number of visits to the three hospitals are moderate in terms of total drug revenues, while the decrease in the net increase in the number of visits to the third hospital is the least significant, it shows that the third hospital is most affected by the drug price reform. In terms of the net increase in drug charges per visit, the degree of decrease is obvious, ranging from 21% to 58% ; in terms of hospitalization, the drug charges per visit in all three hospitals have decreased to different degrees, and the degree of decrease is more obvious, ranging from 23% to 57% ; and in terms of outpatient service, second Hospital and Third Hospital due to the decrease in outpatient volume, the average drug costs increased, which is similar to Ma Aixia [4] et al.

Table 2. Changes of drug expenditure per patient after reform in three urban public hospitals %

Hospital	Net increase in drug revenue	Net increase in visits	Sub-average drug cost net increase
Hospital A			
Outpatient	-10.24	-7.67	-19.2
Be hospitalized	-13.01	31.53	-57.51
Total	-12.72	-5.55	-58.05
Hospital B			
Outpatient	-5.29	-2.91	7.42
Be hospitalized	-5.89	-2.17	-41.98
Total	-5.65	-2.87	-21.22
Hospital C			
Outpatient	2.63	-0.82	13.22
Be hospitalized	-1.42	0.05	-23.08
Total	-1.09	-0.79	-24.44

Note: Net Growth Rate (post-reform real-post-reform forecast) / pre-reform 100%

Changes in the structure of health services income. The study of health services structure income by outpatient and inpatient components, as shown in Table 3. Out-patient medical services include fees for visits, examinations, surgeries and tests, while inpatient services include fees for beds and care. As a result of the total abolition of the drug plus policy, the three hospitals have increased their income from medical services in all aspects since the reform, and the proportion of income from surgery in outpatient services is low, and the proportion of examination fees is high, the income of out-patient examination fees in the third hospital increased by 35.39 percentage points, followed by the cost of laboratory tests, and the income of the three hospitals increased by an average of 12.82 percentage points. The income of out-patient Medical Service in B hospital has the biggest change. In-patient part, a hospital medical service income in all aspects of the most obvious change. On the whole, except the income of operation and nursing, the average income of inspection, examination and test in hospital a was much higher than that in hospital B and Hospital C, of which 44.57% was the income of test The most important part of the internal proportion of B hospital is the examination fee of 23.03% , and the most important part of the examination fee of C hospital is 9.18% .

Table 3. Changes of medical service income structure after reform in three urban public hospitals %

Hospital	Examination	examination	surgery	assay	bed	Nursing
Hospital A						
Outpatient	2.55	15.46	0.66	9.87		
Be hospitalized	28.54	29.18	7.99	44.57	17.71	4.34
Hospital B						
Outpatient	8.18	14.56	0.86	19.8		

hospitalized	2.35	7.94	9.91	23.03	3.34	4.8
Hospital C						
Outpatient	3.6	35.39	2.09	8.8		
hospitalized	1.93	9.18	4.97	8.49	2.28	2.99

Table forecast value's computation method is uses PASW Statistics 18 software, uses the time series analysis method in the exponential smoothing method [5], according to the relevant data of three hospitals, the fitting degree of the model was evaluated by steady R2, and the sum of the values of the four months after the reform was predicted by the data of the first 20 months (January 2016 ~ August 2017) , by calculating the data models are above 0.5, we can deduce that the fitting degree of the data of the third-class hospitals is higher. The structure of the reformed compensation weightings data analysis is shown in Table 4:

Table 4. The proportion of compensation income of public hospitals in three cities after the reform

	Hospital A	Hospital B	Hospital C
Special financial compensation (wan yuan)	424.25	512.37	373.09
Service income compensation amount (wan yuan)	12946.2407	5177.883	2365.7037
Drug markup loss (wan yuan)	2331.29	1436.4	3967.3141
Financial special compensation ratio (%)	18.2	35.67	23.03
Service income compensation ratio (%)	555.33	360.48	59.63
Total compensation ratio (%)	573.53	396.15	82.66

Note: Service Income Compensation Proportion Service Income Compensation Amount / drug plus loss 100% ; financial special compensation proportion financial special compensation / drug plus loss 100% . Among them, 15% of the hospital's drug revenue after the reform of drug plus loss, and the actual service revenue after the reform of service revenue compensation amount-the forecast of service revenue after the reform.

As can be seen from table 4, the sources of hospital compensation include two parts: Government Financial Subsidy and service income subsidy. In the aspect of government financial subsidy, the degree of government financial subsidy of three hospitals is different because of their different dependence on drug income: Hospital B > Hospital a > Hospital C. Among them, the government financial subsidy of B hospital is 5,123,700 yuan for these three hospitals. In terms of service income compensation, the proportion of A and B hospitals are very high, especially a hospital reached 555.33 percentage points. Not only can the two companies rely on health-care revenues to make up for the loss of the zero drug price difference, but they also have a large balance of payments. In contrast, the proportion of service income compensation in C hospital is 59.63 percentage points higher than that in A and B hospitals. The proportion of total compensation also reached 82.66%, and a, B two hospitals obvious gap.

Discussion and Suggestions

Further adjustments to the drug-to-drug ratio and the implementation of the drug plus policy are in place. As can be seen from table 1, while the reforms have resulted in an overall 30.66 per cent drug share in service-dependent hospitals, the proportion of drugs in drug-dependent hospitals has reached 34.27% , and the overall proportion of drugs in drug-dependent hospitals has dropped by 10.62 percentage points, however, there is still a gap with the requirement of the reform that the

proportion of drugs in public hospitals should be reduced to 30% by the end of 2017, especially in drug-dependent hospitals. After the total abolition of the drug bonus, the proportion of drugs in urban public hospitals, especially in the outpatient department, is still high, the medical service compensation as the compensation route of public hospitals stipulated by the State is relatively low relative to the drug income. It is recommended that the relevant departments further strictly control drug prices and appropriately increase the price range of medical services for medical personnel, reflecting the labor value of medical personnel, at the same time, it is emphasized that the government departments should carry out the policy of canceling the drug bonus in an all-round way.

Implementation of differential compensation, dynamic adjustment from the perspective of different types of urban public hospitals, the focus of compensation path is also different. It is insufficient to make up for the loss of hospital revenue under the policy of total elimination of drug markup by optimizing the current increase in medical service fees and government financial subsidies as well as the hospitals' own self-financing, this may create a "cross-compensation" blind spot. Therefore, it is necessary to differentiate the types of hospitals and then to differentiate and adjust the compensation methods dynamically. For General Hospitals, due to the strong comprehensive strength of the hospitals themselves, they have advantages in terms of medical equipment, the number of beds, the proportion of medical insurance reimbursement and the strength of doctors, etc. , the medical income from the number of patients received on a daily basis can basically make up for the loss of income brought about by the total abolition of the drug plus policy, and therefore the special subsidy for them under the state policy can be reduced appropriately; Because the loss of medical income is large under the drug retail sales policy, the state can increase its special subsidy input. Although the state's special financial compensation rate is as high as 50% , the total compensation rate is less than 30% [4] due to the lack of compensation for services, at present, in the way of compensation for public hospitals, it is itself to advocate the adjustment of medical service prices. Therefore, this type of hospitals can continue to optimize the quality of their own services, such as creating a good medical environment and improving the service standards of medical personnel, CREATE HIGH-END VIP ward, let patients feel that they are not to see a doctor, but to enjoy service, to do patient-centered, improve hospital service reputation, make brand effect. At the same time, the government may appropriately increase the input of special subsidies. At the same time, the average cost of treatment should be appropriately reduced to reduce the burden on the masses to seek medical treatment; and the method of calculating the compensation amount for policy-related losses should be adjusted, so as to give consideration to the quality of service and select the best compensation when calculating the quantity of services to be provided, to encourage hospitals to improve service quality [6].

The government should clearly define its position in the current reform of medical prices, and not only determine the government's compensation proportion according to the reform plan of this municipality, budget adjustment and Macroeconomic regulation and control should be done in a timely manner, and relevant national policies on comprehensive drug price reform should be fully implemented. At the level of the central government, hospitals will continue to be required to purchase drugs in quantity. The "two-vote system" policy was introduced to make up for the fact that the growth of drug costs could not be completely controlled under the zero-plus drug policy alone, at the same time, it is also to reduce the prices of medicines that are invisibly magnified tens or even hundreds of times in the circulation link. To a certain extent, it can play the role of reducing the fictitious high cost of medicines, therefore, relevant enterprises and institutions are required to strictly implement the "two-vote system. ". We will intensify efforts to promote the "three-doctor linkage" , accelerate the reform of payment methods for medical insurance, and comprehensively focus on advancing payment methods for medical insurance based on diseases, such as new payment methods based on DRGs, and study innovative medical service pricing projects, continue to improve the innovative per head and bed day payment methods.

Fund Project

Jiangxi Provincial Department of Education's Scientific and Technological Research Project Key Project: Evaluation of Traditional Chinese Medicine Food Therapy Products (160805) ;

Humanities and social science research and planning project of universities in Jiangxi province (GL19136)

Jiangxi University of Traditional Chinese Medicine Project: Exploring the Implementation of Comprehensive Reform of Pharmaceutical Prices in Public Top Three Hospitals in Jiangxi Province

References

[1] Gao Xinjun. The State Council issued the guiding opinions on the pilot comprehensive reform of Urban Public Hospitals J. Journal of Chinese Medicine Administration, 2015(10) : 50-50.

[2] Wu Ching-hsien, he Rongxin and Mao Ying. The loss calculation of the cancellation of drug addition policy in city public hospitals of Shaanxi Province J. China's health economy, 2016,35(4) : 11-13.

[3] Zhao Wei, Yang Lian and Li Jian . Analysis of the effect of canceling drug addition on the economic operation of county-level Public Hospitals J. Chinese Hospital Management, 2015,35(8) : 12-14.

[4] Ma Aixia, Lu Yijuan, Xie Jing and Tang Wenxi. Compensation effect evaluation of comprehensive reform of medical price in different types of Public Hospitals J. Chinese Hospital Management, 2018,3804:12-14.

[5] Wang Xingli. Analysis on the effect of comprehensive reform of medical price in public hospitals of Nanjing City J. Price Monthly, 201806:38-42.

[6] Xiong Yao. An empirical study on the reform of compensation mechanism in Urban Public Hospitals D. Southern Medical University, 2016.