

# Reforming Payment Methods for Basic Medical Insurance to Accommodate Traditional Chinese Medicine (TCM) in China : A Case Study of Shaanxi Province

FANG ZHOU

Xi'an Jiaotong University

XIAOHAO ZHANG (✉ [zhangxiaohao@xisu.edu.cn](mailto:zhangxiaohao@xisu.edu.cn))

Xi'an International Studies University <https://orcid.org/0000-0002-7762-495X>

ZHIGUO MA

Xi'an Jiaotong University

---

## Research

**Keywords:** Traditional Chinese medicine (TCM), Basic medical insurance, Payment methods, Reform, Shaanxi Province of P.R. China

**Posted Date:** May 4th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-25851/v1>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Reforming Payment Methods for Basic Medical Insurance to Accommodate Traditional Chinese Medicine (TCM) in China: A Case Study of Shaanxi Province

Fang Zhou<sup>1</sup>, Xiaohao Zhang<sup>2\*</sup> and Zhiguo Ma<sup>3</sup>

## Abstract

**Background:** Traditional Chinese medicine (TCM) attaches importance to the philosophy of holism and disease prevention. Meanwhile, costs arising from TCM diagnosis and treatment services are relatively low. Such features cater to the needs of less developed countries and regions to increase the equity and accessibility of medical services and to save basic medical insurance funds. However, China's current payment system for basic medical insurance fails to fully regard these features, thus unable to incent the demand for and supply of TCM services.

**Methods:** Based on the analysis of the features or rather the advantages of TCM, the article, taking Shaanxi Province located in central China as an example, studies the status quo of economic development, coverage of TCM diagnosis and treatment services by basic medical insurance, implementation of payment methods for basic medical insurance in TCM medical institutions, and aims to explore the reformation of payment methods for basic medical insurance.

**Results:** Statistics have shown that the economic power of Shaanxi Province is below average in China, as a result of which, Shaanxi Province is confronted with a general lack of basic medical insurance fund. On the other hand, the present payment methods for basic medical insurance fail to accommodate the features of TCM. Besides, only a very limited number of TCM medical institutions, service items and medicines are covered by basic medical insurance. Consequently, the advantages of TCM are not exploited to the full in a country that has always treasured TCM. Therefore, reformation in payment methods is pressing.

**Conclusions:** In view of the economic and social development of Shaanxi Province, this article proposes to reform the payment methods for basic medical insurance by introducing a new medicinal-effect-based payment method to accommodate TCM. This payment method has the following four features. Firstly, it advocates strengthening process supervision of diagnosis and treatment activities in medical institutions, establishing a rating system for therapeutic or prophylactic effects, and implementing a reward and punishment mechanism accordingly. Secondly, special audit standards for TCM services shall be determined by the health care department of the people's government together with the relevant TCM administrative department, more TCM institutions, service items and medicines shall be covered by basic medical insurance, and the negotiation mechanism with medical insurance institutions shall be adjusted. Thirdly, in pricing the fees and standards for TCM services, the price control administrations of the people's government shall consult TCM experts, and dynamic price adjustments based on costs and professional technical values shall be made. Last but not least, outpatient diagnosis and treatment services shall be covered by basic medical insurance fund, a practice which will not only give full

---

\* Correspondence: zhangxiaohao@xisu.edu.cn

<sup>1</sup> Law School, Xi'an Jiaotong University, Xi'an, Shaanxi, P.R.China

<sup>2</sup> School of Translation and Interpreting, Xi'an International Studies University, Xi'an, Shaanxi, P.R.China

<sup>3</sup> Law School, Xi'an Jiaotong University, Xi'an, Shaanxi, P.R.China

play to the advantages TCM services, but also help reduce the financial burden on patients and save medical insurance funds.

**Keywords:** Traditional Chinese medicine (TCM), Basic medical insurance, Payment methods, Reform, Shaanxi Province of P.R. China

## Background

Traditional Chinese medicine (TCM) is highly treasured in traditional Chinese culture<sup>[1]</sup>. It attaches importance to the philosophy of holism and disease prevention. Meanwhile, costs out of TCM diagnosis and treatment services are relatively low. Such features of TCM cater to the needs of less developed countries and regions in their endeavor to prevent, diagnose and treat diseases, to increase the equity and accessibility of medical services, and to save basic medical insurance fund. Sadly, these features are not fully regarded in China's current payment system for basic medical insurance nationwide, which has in turn failed to incent the demand for and supply of TCM services. On June 20<sup>th</sup>, 2017, China's General Office of the State Council issued the *Guiding Opinions on Further Deepening the Reform of Payment Methods for Basic Medical Insurance* (hereinafter the "Guiding Opinions"). The Guiding Opinions explicitly state that ".....exploring payment methods that match the features of TCM services and encouraging the supply and use of appropriate TCM services"<sup>[2]</sup> are the main aspects of the next step of reform. In addition, the Guiding Opinions authorize local governments to explore vigorously localized medical insurance payment methods, taking into consideration factors such as the capacity of basic medical insurance fund. On December 5<sup>th</sup>, 2018, the National Health Commission, along with five other departments, jointly issued the *Notice on Launching a Pilot Program for Establishing a Comprehensive Modern Hospital Management System*. The notice introduces the pilot tasks of "exploring payment methods that match the features of TCM services and promoting the supply and use of TCM services"<sup>[3]</sup>. On October 20, 2019, the Central Committee of the Communist Party of China and the State Council released "*Opinions on Promoting the Inheritance and Development of Traditional Chinese Medicine*", further highlighting China's determination to reform payment methods for basic medical insurance tailored for TCM, to improve the equity and accessibility of TCM services, and to enhance public health care throughout the nation.

A viable path in China's ongoing reformation of payment methods for basic medical insurance is to introduce a novel payment method based on the proper understanding of the features of TCM which takes into account the economic development and level of public health care in various regions of the country.

## Methods

### Study design

Firstly, the article takes as its theoretical basis a scientific interpretation of the features of TCM. Secondly, Shaanxi Province is chosen as a sample for economically underdeveloped regions of China and comparative analysis is made of statistics related to economic development, public health care and coverage of TCM services by basic medical insurance among Shaanxi Province, nationwide and Shanghai Municipality (the region with the highest disposable income per capita in China) in order to ascertain the status of Shaanxi Province in the hierarchy of economic development in China and the gap between Shaanxi Province and economically developed regions. Thirdly, attention is given to the incoordination between payment methods for basic medical insurance in Shaanxi Province and the features of TCM, after which the necessity and significance

of reforming such payment methods are highlighted. Lastly, the article proposes a novel payment method accommodating TCM.

## Data resource

The data in this study are mainly from *China Statistical Yearbook 2019*, the newest annual statistical publication available that reflects comprehensively the economic and social development of China. This yearbook covers data for 2018 together with key statistical data in recent years and some historically important years at both national level and such local levels as provinces, autonomous regions and municipalities directly under the central government <sup>[4]</sup>.

In addition, from August 1 to September 30, 2019, Shaanxi Administration of Traditional Chinese Medicine conducted a survey of the implementation of the reformation of medical insurance payment methods in 81 public TCM institutions in Shaanxi Province (hereinafter “SATCM Survey”). SATCM Survey mainly included: (1) coverage of TCM services by basic medical insurance, (2) adoption of basic medical insurance payment methods, and (3) opinion as to the friendliness of medical insurance payment methods to TCM. In the survey, a total of 81 questionnaires were mailed to 81 public TCM institutions, and a special person was assigned to be in charge of the recovery of questionnaires and data entry. All questionnaires were finally recovered (100.0%), according to which, 79 institutions (97.5%) attempted to reform their present payment methods for basic medical insurance. The data were entered in parallel with EipData3.1 and logical proofreading, and SPSS19.0 was used for data processing and analysis. Based on the survey, this paper analyzes the current reformation of basic medical insurance payment methods in public TCM institutions in Shaanxi Province and their adaptability to TCM services.

## Overview of Features of TCM

Compared with West medicine, for which most of the present payment methods for basic medical insurance have been tailored, TCM has many unique features and edges, which is why China holds TCM so dearly and is eager to have it play a more and more important role in disease prevention and treatment.

### *Philosophy of holism*

Based on the concept of holism, TCM regards the human body as an integrated and interconnected system<sup>[1]</sup>, not as dissected parts, and provides disease prevention and treatment services based on syndrome differentiation, aiming to achieve a balance between *yin* and *yang*. A good example is *San-Fu-Tie*, a sticking-plaster to treat bronchial asthma. *San-Fu-Tie* embodies the dialectic and holistic philosophy of TCM’s “nourishing *yang* in spring and summer, and treating winter diseases in summer <sup>[5]</sup>.” Although the symptoms of bronchial asthma patients usually aggravate in winter and the suffering is alleviated in summer, the period between early July and early September with sultry weather of summer (*San-Fu* Period) is when *yang* reaches its peak. During this period, the application of *San-Fu-Tie* conduces to strengthening *yang* of the patients so that in winter new or aggravated symptoms will ease or even disappear, thus achieving the purposes of curing diseases and health preservation. This example points to the challenge to examine TCM diagnosis and treatment services by applying the standards of modern clinical medicine.

### *Health preservation and disease prevention*

In addition to diagnosis and treatment after a patient falls ill, TCM emphasizes health preservation and disease prevention. Since ancient times, TCM has advocated “countering diseases by preventing them before they begin, just like a good government or emperor is known for taking necessary steps to avert war, while treating diseases after contraction is similar to suppressing a

revolt after breakout <sup>[5]</sup>.” For instance, *San-Jiu-Tie*, a follow-up treatment to *San-Fu-Tie*, not only enhances the treatment of *San-Fu-Tie*, but also aims to prevent disease by strengthening physique <sup>[6]</sup>.

*Effects of medical services heavily reliant on TCM doctors’ skills and quality of Chinese medicinal materials*

TCM diagnosis is conducted by means of observation (*wang*), olfaction (*wén*), inquiry (*wèn*), and palpation (*qie*), and Chinese medicinal materials, acupuncture, and massage are applied for treatment <sup>[7]</sup>. Consequently, the effect of TCM diagnosis and treatment is subject to human endeavor, such as knowledge, experience, and level of skill of TCM doctors, as well as the quality of the Chinese medicinal materials prescribed.

*Individualized treatment plans*

TCM holds that even for the same disease, the symptoms may vary greatly on the basis of the age, gender, and physical conditions of individual patients. In light of this, the therapeutic plans for various patients with identical disease often differ according to the “verification of the syndromes <sup>[1]</sup>.” Even in the course of treatment for the same patient, the assorted Chinese medicinal materials in the same prescription will be adjusted from time to time as the phase of disease and condition of the patient may require. In the fight against the novel coronavirus pneumonia (COVID-19) outbreak in China in 2020, TCM doctors have implemented an individualized treatment method of “one person, one prescription”, and the cure rate has been clinically verified.

*Less costly diagnosis and treatment services*

Based on statistics from the *White Paper: Chinese Medicine in China*, with relatively low cost, TCM has contributed a higher share of services in relation to the resources it is entitled to. In 2015, outpatient expenses and inpatient expenses per visit to public TCM institutions were, respectively, 11.5 percent and 24 percent lower than those to non-TCM public institutions <sup>[1]</sup>. Furthermore, due to the emphasis on disease prevention, TCM diagnosis and treatment activities are more suitable for outpatients. Active and steady promotion of the coverage of TCM institutions by basic medical insurance will not only help to promote the development and inheritance of TCM services in accordance with TCM’s own laws, but also reduce the economic burden on patients, reduce hospitalization rate, and save medical insurance funds.

**Analysis**

**Reformation in payment methods to accommodate TCM in Shaanxi Province: a pressing task**

Shaanxi province is located in central China and covers an area of 205,600 km<sup>2</sup> with a population of 38.64 million by 2019 <sup>[8]</sup>. Though known for its rich TCM resources, Shaanxi Province is categorized as an economically underdeveloped region in China due to its low GDP and disposable income per capita of households. In 2019, the disposable income per capita in Shaanxi Province was 24,666 CNY (3,508US\$, as compared to the national average of 30,733 CNY nationwide) (Table 1) <sup>[9]</sup>. The corresponding figure in 2018 was 22,528 CNY, once again below the national average of 28,228 CNY, and roughly one third of that in Shanghai Municipality <sup>[4]</sup>.

**Table 1** Gross Domestic Product & Disposable Income Per Capita of Households by Region (2019) <sup>[9]</sup>

Region	Gross Domestic Product (100 million CNY)	Disposable Income Per Capita of Households (CNY)
--------	---	---

Nation Total	990,865	30,733
Shanghai	38,155.32	69,442
Shaanxi	25,793.17	24,666

Moreover, the public health care in Shaanxi Province is rather frustrating. Corresponding to its economic development, the annual revenue of basic medical insurance in Shaanxi Province is comparatively low, even less than half of Shanghai Municipality. The same is true with the surplus of basic medical insurance fund at year-end in Shaanxi Province where the revenue and the expense are roughly balanced. (Table 2)

**Table 2** Revenue and Expense of Basic Medical Insurance by Region (2018) <sup>[4]</sup>

Region	Revenue (100 million CNY)	Expense (100 million CNY)	Surplus at year-end (100 million CNY)	Cumulative balance (100 million CNY)
Nation Total	21,384.2	17,822.5	3,561.4	23439.9
Shanghai	1,199.5	894.3	305.2	2391
Shaanxi	515.8	437.8	78	446.7

As for coverage by basic health insurance, there are 163 TCM institutions, with a total of 30,815 beds in Shaanxi Province, but only 17 institutions are covered by basic medical insurance at provincial level in 2019-2020 <sup>[10]</sup>. This low rate is echoed by SATCM Survey. According to the survey, from January to December 2018, the numbers of outpatients and inpatients in the 81 institutions were respectively 9,600,253 (92.96% of total) and 727,306 (7.04% of total). The number of discharged patients covered by basic medical insurance was only 422,041, only taking up 4.09% of the total cases since no outpatients are eligible for basic medical insurance reimbursement.

Therefore, a reform in payment methods for basic medical insurance in Shaanxi Province to accommodate TCM so as to optimize such TCM edges as lower costs and disease prevention will be an essential and pressing move towards upgrading public health care and saving basic medical insurance funds significantly. Furthermore, the experience of designing and implementing such reform can provide a reference for other provinces and regions with similar economic development.

**Between current payment methods and TCM services: big gap to fill**

On September 30, 2017, the General Office of the People’s Government of Shaanxi Province issued the *Implementation Scheme of Deepening the Reform of Payment Methods for Basic Medical Insurance in Shaanxi Province* (hereinafter “Implementation Scheme”). The Implementation Scheme confirms the goals of the reform as follows: “From 2017, we will further enhance the budget management of basic medical insurance, and gradually advance the reform in payment mechanism featured by diversified and differentiated payment methods based on the principle of total quantity control with payment by disease type as the preferable method. The reform will improve various other payment methods like payment by per capita, quotas, and bed-days. We encourage regions with favorable conditions to explore pilot payment methods based on diagnosis related groups <sup>[11]</sup>.” On May 14, 2018, the Department of Human Resources and Social Security of Shaanxi Province issued the *Notice to Further Advance of the Reform of Payment Methods for*

*Basic Medical Insurance*, which further explains that in 2018, the types of diseases covered by basic medical insurance in each city shall be no less than 100 <sup>[12]</sup>.

However, in the process of reformation in Shaanxi Province, the payment methods being adopted are obviously not yet ready to embrace TCM.

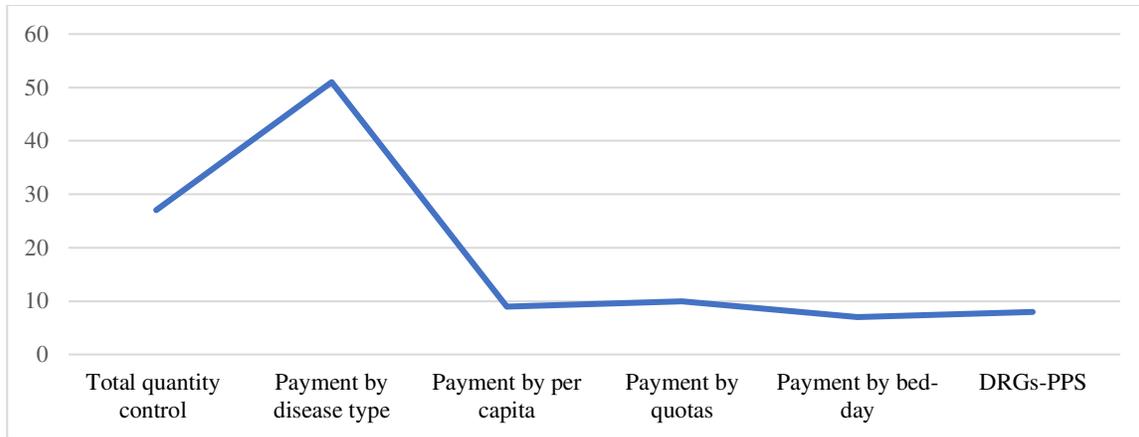
**Table 3** Payment Methods for Basic Medical Insurance in 81 Public TCM Institutions in Shaanxi Province (2018)

Payment methods	Total quantity control	Payment by disease type	Payment by per capita	Payment by quotas	Payment by bed-day	DRGs-PPS
Institutions <sup>4</sup>	43	69	9	26	3	3
Cases	192308	81669	39576	92555	13177	2756
Proportion of total	45.57%	19.35%	9.38%	21.93%	3.12%	0.65%

*Total quantity control method: failing to mirror costs for TCM services*

The total quantity control method is the practice of fixing the current payment amount by referring to historical data of cost on the part of medical institutions and payment capacity on the part of basic medical insurance funds, aiming to achieve the goal of cost control. However, in recent years, market prices of Chinese medicinal materials have increased more markedly than those of Western medicines due to factors like environmental depredation and soaring labor costs <sup>[6]</sup>. The price increase is especially dramatic for high-quality authentic Chinese herbal medicines. Besides, it is very challenging to foresee the fluctuations in prices for the purpose of cost estimation. Thus, a presumption based on historical data may more often than not result in insufficient compensation to medical institutions, incapacitating them for meeting expenses and consequently damping the enthusiasm of medical institutions and their personnel for TCM services. Among the 81 public TCM institutions participating in the SATCM Survey, 43 institutions put in place total quantity control payment method. The number of cases settled in 2018 was 192,308 (Table 3), accounting for 45.57% of the 422,041 cases covered by basic medical insurance throughout the year. From the perspective of the number of cases settled, it can be said that the total quantity control method is the most popular method adopted by public TCM institutions in Shaanxi Province. However, at the same time, only 27 of the 81 institutions (33.33%) responded in the survey that the total quantity control method can reasonably reflect the cost of TCM doctors/institutions' services, and can in turn effectively mobilize the doctors' enthusiasm to inherit and practice TCM (Fig. 1).

<sup>4</sup> Medical institutions can choose to apply multiple basic medical payment methods at the same time in China.



**Fig. 1** Medical institutions’ preferences for various payment methods<sup>5</sup>

*Payment by disease type: inconsistent with TCM’s philosophy of holism*

Payment by disease type is the payment method to determine fixed payment amounts based on universal disease categories, the “clinical path” of a single disease, and to calculate inpatients’ costs relating to a specific disease [7]. Because TCM diagnosis and treatment services highlight the philosophy of holism and syndrome differentiation, disease-type based payment not only undermines the integrity of TCM services, but also puts unreasonable restraint on the capacity of TCM treatment process to make adjustments according to the phase of diseases and individual patients’ conditions. SATCM Survey, on the one hand, found that although 69 public TCM institutions had been reimbursed by disease types, the number of disease types paid was quite limited in general (only 7 institutions had been reimbursed for more than 100 disease types). On the other hand, the number of cases settled by the disease type payment method was also limited: in 2018, a total of 81,669 cases were settled, accounting for only 19.35% of the total cases (Table 3). 51 of the 81 institutions (62.96%) agreed that payment by disease type can reasonably reflect the cost of TCM doctors/institutions’ services, and can in turn effectively mobilize the doctors’ enthusiasm to inherit and practice TCM (Fig. 1). Although the survey shows that most medical institutions prefer this payment method, due to the limited number of disease types, the actual number of cases paid is relatively small.

*Payment by per capita, bed-day, or quotas: poor guide for TCM services*

Payment by per capita (i.e., the number of visits multiplied by the approved average outpatient fee), by bed-day (i.e., the number of bed-days multiplied by the rigorously calculated daily fee or pre-calculated fixed item fee), and by quotas (i.e., pre-calculated fixed item fee) are in essence all payment methods of fixed amounts. TCM services rely heavily on the doctors’ knowledge, experience, and skill to diagnose and treat diseases, which are time-consuming and labor-intensive processes. TCM diagnosis and treatment are patient-specific as well. In practice, fixed-mount payment impels TCM doctors to substitute traditional diagnosis based on doctors’ personal judgments with machine-based test results [7]. This will not only result in the dying out of many traditional diagnostic and treatment methods, but also undermine the reputation of TCM services. Moreover, such payment methods increase the financial burden of patients and meanwhile cause the waste of medical insurance funds. SATCM Survey revealed that neither payment by per capita nor payment by bed-day was widely adopted in public TCM institutions: 10 institutions settled on a per-capita basis 39,576 cases (9.38% of total) and 3 institutions settled on a bed-day basis 13,177

<sup>5</sup> In the survey, the basic medical payment methods preferred by medical institutions can be various.

cases (3.12% of total). Relatively more institutions adopted payment by quotas: 26 institutions took this method, with a total of 92,555 cases paid (21.93% of total) (Table 3). However, among these institutions, only 9, 10, and 7 institutions responded respectively in the survey that paying by per capita, bed-day, or quotas can reasonably reflect the cost of TCM doctors/institutions' services, and can in turn effectively mobilize the doctors' enthusiasm to inherit and practice TCM (Fig. 1).

### *DRGs-PPS: incapable of reflecting the value of TCM services*

DRGs-PPS is a prospective payment system (PPS) based on diagnosis related groups (DRGs). In this method, a scientific calculation of payment standard for each group is made first and then advance payment based on such payment standard will be made to medical institutions<sup>[13]</sup>. The DRGs classify and then group together patients with similar principal diagnoses, the assumption being that these diagnoses require similar treatment protocols and hence consuming similar reservoir of resources<sup>[14]</sup>. In order for the DRG scheme to be practical and meaningful, there should be a manageable number of DRGs encompassing all patients seen on an in-patient basis, and each DRG should contain patients both with a similar pattern of resource intensity and similar from a clinical perspective<sup>[14]</sup>.

The International Classification of Diseases (ICD), the diagnostic classification standard for all clinical and research purposes, is the basis and criteria for DRG grouping<sup>[15]</sup>. WHO was entrusted with the creation of ICD in 1948 and has published 11 versions by now. ICD-10, endorsed in May 1990 by the Forty-third World Health Assembly, has been widely cited and adopted by more than 100 countries around the world. The latest version, ICD-11, was released on 18 June 2018 to allow member states to prepare for implementation. There are 26 chapters in ICD-11: chapters 1-24 encode various disease classifications, chapter 25 encodes special purposes, and chapter 26 encodes a supplementary chapter for "Traditional Medicine Conditions - Module I." This supplementary chapter refers to disorders and patterns which originated in ancient Chinese Medicine. But the description of the chapter says that this supplementary chapter is a subclassification for optional use and not intended for mortality reporting. Coding should always include also a category from the chapters 1-24 of ICD<sup>[16]</sup>.

TCM prescribes individualized treatments based on each patient's physical conditions and syndromes<sup>[1]</sup>, therefore contradicting the grouping practice of DRGs. Consequently, it would be impossible to design payment groups for TCM diagnosis and treatment services in line with the categories in ICD, and the principles of whether there exists a significant complication or comorbidity. That is, DRGs, which determine payment rates based on the difficulty in diagnosis and the differences in costs, cannot accurately group TCM services. According to SATCM Survey, only 3 out of the 81 public TCM institutions were paid by DRGs-PPS, with 2,756 cases (0.65% of total) settled in 2018. But, 8 institutions (9.88% of total) responded that payment by DRGs can reasonably reflect the cost of TCM doctors/institutions' services, and can in turn effectively mobilize the doctors' enthusiasm to inherit and practice TCM (Fig. 1).

In conclusion, the reformation of payment methods for basic medical insurance in Shaanxi TCM medical institutions is by far not satisfactory. The fundamental reason lies in the fact that the existing payment methods fail to take into consideration the striking differences between TCM and Western medicine in terms of concept, manners of diagnosis and treatment, and use of medicine.

## **Discussion**

In light of the disharmony between the present payment methods for basic medical insurance and TCM, it is urgent to initiate reforms that accommodate TCM in Shaanxi Province. Such reforms, by optimizing the edges of TCM, will not only enhance equity and accessibility of medical services to the public, but also reduce medical costs. They will also help save basic medical insurance funds

and provide a reference for other underdeveloped areas in China. To this end, we make the following proposals.

First, it is advisable for the government to adopt a novel payment method based on the overall effectiveness of medical services. To begin with, the government should enhance the process supervision of medical activities in medical institutions and establish a rating system based on treatment and disease prevention performances, rewarding top-rated medical institutions and reducing funds or even punishing those with low ratings. By focusing on the health conditions of the insured, and attaching importance to holism and disease prevention, this new payment method fits in perfectly with the features of TCM. It has the rights and interests of patients at its core, and meanwhile ensures the efficient use of basic medical insurance funds.

Second, the basic medical insurance administrations shall cooperate with TCM administrations to establish auditing standards fit for TCM, and cover more qualified TCM institutions in basic medical insurance. Additionally, these administrations should adjust the mechanism of negotiations with the medical insurance institutions, expanding the scope of payment of basic medical insurance funds to cover all qualified TCM diagnosis and treatment programs, herbal decoction pieces, formulated medicines, and TCM preparations produced by medical institutions.

Third, in deciding what items to charge and fee standards for TCM services, the price control administrations shall solicit opinions from TCM experts. Besides, the prices are to be adjusted dynamically with the costs and values of professional techniques to ensure the continuity and extensive innovation of TCM services.

Last but not least, coverage of outpatient consultation and treatment activities by basic medical insurance will not only highlight the advantages of TCM diagnosis and treatment services, but also help reduce the financial burden on patients and save medical insurance funds in general. This will greatly improve the accessibility and equity of TCM services and in turn public health care to patients in less-developed areas.

## **Conclusion**

In conclusion, this article proposes to reform the payment methods for basic medical insurance by introducing a novel payment method accommodating the features of TCM diagnosis and treatment services in economically less developed regions like Shaanxi Province. The reform aims to optimize such edges of TCM services as disease prevention and relatively low cost by first designing evaluation indicators for effects of medical services, taking into consideration the value and cost of TCM diagnostic and treatment services, paying for TCM services on the basis of comprehensive evaluation of medical services, and then, coverage of outpatient diagnosis and treatment services and more qualified TCM medical institutions, diagnosis and treatment services, and medicines by basic medical insurance.

## **Abbreviations**

TCM: Traditional Chinese Medicine; DRGs-PPS: Diagnosis related groups-prospective payment system; ICD: International Classification of Diseases

## **Acknowledgements**

Not applicable.

## **Authors' contributions**

Conception and design (FZ, XHZ); acquisition of data (FZ); data analysis and interpretation (FZ); drafting of the manuscript (FZ, XHZ); critical revision the manuscript for important intellectual content (FZ, XHZ, ZGM). All authors (FZ, XHZ, ZGM) approved of the final manuscript.

## **Funding**

This study was funded by the National Social Science Fund of China (Project No.: 16ZDA235). The funder played no role in the design of the study; the collection, analysis, and interpretation of data; or in writing the manuscript.

## **Availability of data and materials**

The data supporting the findings of this study are mainly from *China Statistical Yearbook 2019* published by the National Bureau of Statistics of P.R. China, accessible at: <http://www.stats.gov.cn/tjsj/ndsj/2019/indexch.htm>. Accessed Jan. 18, 2020.

The investigation into the implementation of the reform of basic medical insurance payment in public TCM institutions of Shaanxi Province in 2019 that supports the findings of this study is available from Shaanxi Administration of Traditional Chinese Medicine. Restrictions apply to the availability of data used for the current study. Please visit <http://atcm.shaanxi.goc.cn/services/datarequests/> for information on how to acquire these data.

## **Ethics approval and consent to participate**

This study was approved by the Ethics Committee of the Health Science Center of Xi'an Jiaotong University, and is compliant to the ethical principles in the Declaration of Helsinki (Approval number: 2019–967). All participants have obtained informed consents from the investigators before data collection.

## **Consent for publication**

Not applicable.

## **Competing interests**

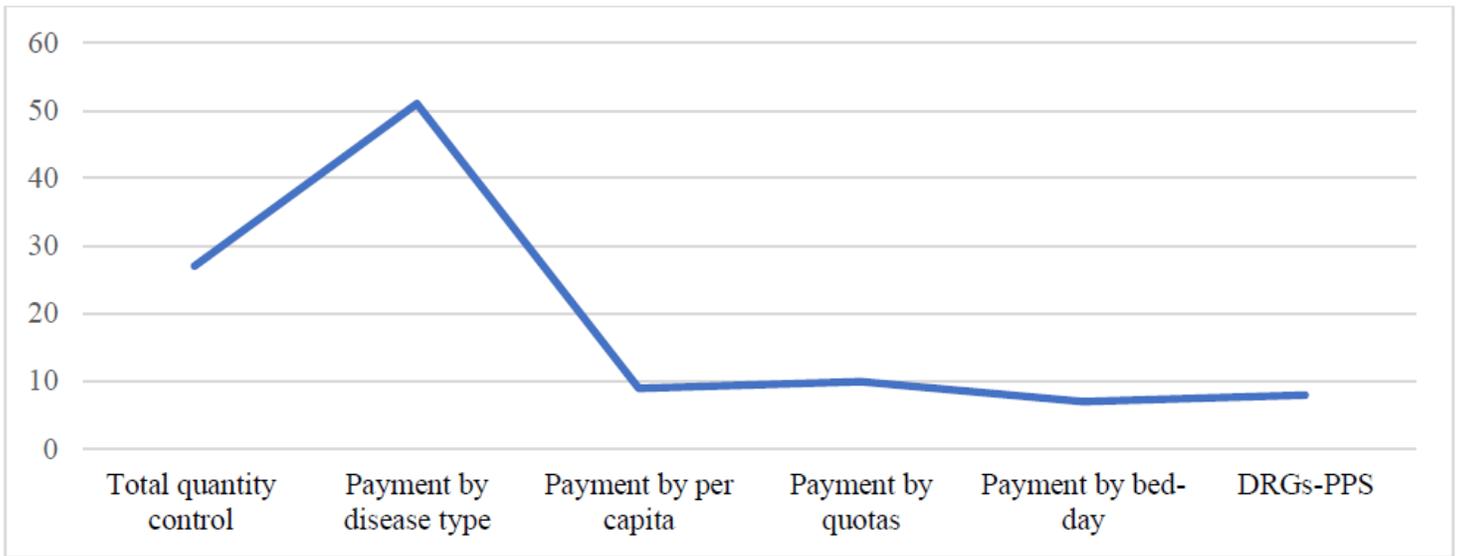
The authors declare that they have no competing interests.

## **References**

1. China's State Council Information Office. White Paper on Traditional Chinese Medicine in China. [http://www.china.org.cn/chinese/2017-01/17/content\\_40120942.htm](http://www.china.org.cn/chinese/2017-01/17/content_40120942.htm). Accessed February 20, 2020.
2. General Office of the State Council of PRC. Guiding Opinions on Further Deepening the Reform of Payment Methods for Basic Medical Insurance. [http://www.gov.cn/zhengce/content/2017-06/28/content\\_5206315.htm](http://www.gov.cn/zhengce/content/2017-06/28/content_5206315.htm). Accessed April 8, 2020.

3. National Health Commission. Notice on Launching a Pilot Program for Establishing a Comprehensive Modern Hospital Management System. <http://www.nhc.gov.cn/tigs/s7848/201812/8ff748fb0c404a5c8eb9e7b3c1a64ee3.shtml>. Accessed April 8, 2020.
4. National Bureau of Statistics. China Statistical Yearbook (2019). <http://www.stats.gov.cn/tjsj/ndsj/2019/indexch.htm>. Accessed Jan. 18, 2020.
5. Yellow Emperor. Canon of the Yellow Emperor: Basic Questions. Beijing, China: People's Medical Publishing House; 2012.
6. Zhu J. Awkward Situation and Development of TCM under the Existing System of Medical Insurance. Tianjin Social Insurance, 2017(05): 53-55.
7. Xie JM, Zhang QQ, Wang ZY, Qiu WR, Ni N, Ren J. Consideration on the Payment Methods and Standards of Medical Insurance Service in Traditional Medicine Service. China Medical Insurance, 2017(07): 51-53.
8. Shaanxi Statistical Yearbook (2019). <http://tjj.shaanxi.gov.cn/upload/2020/pro/3sxtjnj/zk/indexch.htm>. Accessed Jan. 18, 2020.
9. National Bureau of Statistics. Statistical Bulletin of the People's Republic of China on 2019 National Economic and Social Development. [http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228\\_1728913.html](http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228_1728913.html). Accessed April 13, 2020.
10. Shaanxi Provincial Healthcare Security Administration. List of the Basic Medical Insurance Institutions of Shaanxi Province 2019-2020. <http://ybj.shaanxi.gov.cn/zwgk/sjfb/qgyljgcx/959.htm>. Accessed Jan. 18, 2020.
11. General Office of the People's Government of Shaanxi Province. Implementation Scheme of Deepening the Reform of Payment Methods for Basic Medical Insurance in Shaanxi Province. <http://www.shaanxi.gov.cn/zfgb/97485.htm>. Accessed April 8, 2019.
12. Department of Human Resources and Social Security of Shaanxi Province. Notice to Further Advance of the Reform of Payment Methods for Basic Medical Insurance. <http://219.144.222.219:8899/html/100253/1013499.html>. Accessed Jan. 18, 2020.
13. Zhu SJ, Bao YR. Brief Introduction to DRGS: Reform on the Payment Methods of Medical Costs. China Journal of Hospital Administration, 2006, 122 (20) : 664-665.
14. Centers of Medicare & Medicaid Services (USA). Design and Development of the Diagnosis Related Group (DRG). [https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode\\_cms/Design\\_and\\_development\\_of\\_the\\_Diagnosis\\_Related\\_Group\\_\(DRGs\).pdf](https://www.cms.gov/icd10m/version37-fullcode-cms/fullcode_cms/Design_and_development_of_the_Diagnosis_Related_Group_(DRGs).pdf). Accessed April 18, 2020.
15. Zhang X. Function of ICD for Implementing DRGs in Hospitals. Huaxia Medicine, 2018, 31(05): 152-155.
16. WHO. Classification of Diseases. <https://www.who.int/classifications/icd/en/>. Accessed Jan 8, 2020.

# Figures



**Figure 1**

Medical institutions' preferences for various payment methods