

Analysis of the Government Health Expenditure in the First Decade of Chinese New Medical Reform (2009–2018): Xinjiang Uygur Autonomous Region as an Example

This article was published in the following Dove Press journal:
Risk Management and Healthcare Policy

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Objective: To analyze the status of government health expenditure in Xinjiang Uygur Autonomous Region since the first 10 years from the new medical reform, and find the existing problems in order to provide evidence for the government to formulate medical and health policies.

Methods: Based on the health expenditure monitoring data of Xinjiang Uygur Autonomous Region government from Urumqi Central Sub-branch of the People's Bank of China, combined with the relevant data in Xinjiang statistical yearbook, Excel2013 and SPSS19.0 were used to conduct a comparative analysis of government expenditure data from 2009 to 2018.

Results: The average annual growth rate of the government's health expenditure in Xinjiang Uygur Autonomous Region was 12.25%, which was similar to the national level. The proportion of government health expenditure in gross domestic product increased from 0.97% to 1.07%, while the proportion in the total fiscal expenditure decreased from 3.06% to 2.63%, which led to far behind the national and even western area level. The Gini Coefficient of per capita government health expenditure in every city (state) of the autonomous region fell from 0.46 to 0.32 between 2014 and 2018. In the past decade, the ratio between public health expenditure and medical institution expenditure has decreased from 1.01 to 0.42, led to insufficient proportion of public health expenditure. The health expenditure level of the four prefectures especially Kashgar and Hotan in Southern Xinjiang was still far lower than the whole autonomous region and the national average level.

Conclusion: The government of Xinjiang Uygur Autonomous Region should continuously strengthen the financial expenditure in health, maintain the current situation of preferential policy implementation for rural and grassroots expenditure, constantly optimize the proportion of various financial expenditures, and strive for the transfer payment from the central and autonomous regional governments to the four prefectures in Southern Xinjiang.

Keywords: new medical reform, Xinjiang Uygur Autonomous Region, government finance, health

Introduction

Xinjiang Uygur Autonomous Region locates in the hinterland of Eurasia and the northwest frontier of China. Its total area is 1,664,900 square kilometers, accounting for about one sixth of Chinese total land area. By the end of 2018, Xinjiang had a permanent population of 24.8676 million, with GDP of 1219.9 billion Yuan (CNY).

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Since the Central Committee of the Communist Party of China and the State Council issued the Opinions on Deepening the Reform of Medical and Health system in April 2009, a new round of health reforms had been started, which put forward the short-term goals of “effectively reducing the burden of medical expenses on residents, effectively easing the difficulty and high cost of medical treatment”, and the long-term goals of establishing and improving the basic medical and health system covering both urban and rural residents, and providing safe, effective, convenient and inexpensive medical and health services for the people.^{1,2} The public welfare-oriented reform line established by the new healthcare reform plan has made it clear that government responsibility played an indispensable role in health care.^{3,4} However, the most immediate embodiment of government responsibility was that at all levels of Chinese government invest in the field of health care through the financial expenditure.^{5,6} Furthermore, it was necessary to make a further analysis and evaluation of the government expenditure, that to assess whether the government financial health expenditure met the requirements of the medical reform and achieved the goals of the medical reform.

The Chinese new medical reform has been lasting the first 10 years by 2018. The emphasis of this study was to suggest the current situation of the health expenditure at all levels of government in Xinjiang Uygur Autonomous Region during the past decade and analyzed the existing problems in the financial expenditure of health in Xinjiang Uygur Autonomous Region, therefore providing a certain foundation for at all levels of governments in Xinjiang Uygur Autonomous Region to formulate medical and health policies.

Methods

Data Sources

All Data based on the health expenditure monitoring data of Xinjiang Uygur Autonomous Region government from Urumqi Central Sub-branch of the People's Bank of China, combined with the relevant data about population, financial expenditure and GDP in Xinjiang Statistical Yearbook. All data in this study were open government data and therefore needed not to require the approval of the ethics committee.

Statistical Caliber

Government expenditure on health investment is the expenditure on medical and health care and family planning under the functional classification of general public budget expenditure of the classification of government

revenue and expenditure (210 categories), which includes the expenditure on medical and health management, public hospitals and grass-roots medical and health institutions, public health, medical security, traditional Chinese medicine and family planning, even on the supervision and management of food and drug. However, the rehabilitation expenditure of disabled persons, the government subsidies for medical insurance of laid-off workers, the expenditure on medical insurance administration (the three categories are the 208 category of expenditure function classification of general public budget), and the expenditure on health services of the army and armed police are not included.⁷ The government financial expenditure on health care is also the most common database used to reflect the level and structure of health financial expenditure in China.

Statistical Analysis

Excel 2013 and SPSS 19.0 were used to conduct a comparative analysis of government expenditure data from 2009 to 2018. Gini Coefficient also was calculated by Excel 2013.

Results

Overall Level of Government Health Expenditure

As could be seen from [Table 1](#) and [Figure 1](#), the total health expenditure of the Xinjiang Uygur Autonomous Region Government reached 69,865,911,051 Yuan from 2009 to 2018, with an average annual growth of 12.25%. For the past 10 years of the new medical reform, the government's health expenditure funds have increased from 4,125,418,263 Yuan in 2009 to 5,906,529,018 Yuan in 2011 and then dropped back to 5,524,416,907 Yuan in 2012. The funds surged to 7,147,070,976 Yuan in 2015 after the decrease in 2013 and 2014 and then increased year by year. The average annual growth rate of per capita government health expenditure increased by 10.68%, from 191.08 Yuan in 2009 to 267.38 Yuan in 2011, then dropped back to 247.40 Yuan in 2012, but it increased from 302.84 Yuan to 526.95 Yuan between 2015 and 2018. The proportion of government health care expenditure in gross domestic product (GDP) increased from 0.97% to 1.07%, while the proportion of government health care expenditure in the whole financial expenditure decreased from 3.06% to 2.63%. Meanwhile, the two proportions also were much lower than the levels of whole of China ([Figure 2](#)).

Table I List of Government's Health Expenditure in Xinjiang Uygur Autonomous Region from 2009 to 2018

	Total Expenditure (Yuan)	Population (Ten Thousands People)	Per Capital Expenditure (Yuan)	GDP (100 Million Yuan)	Proportion of GDP (%)	Financial Expenditure (100 Million Yuan)	Proportion of Financial Expenditure (%)
2009	4,125,418,263	2159	191.08	4273.58	0.97	1346.91	3.06
2010	4,482,389,463	2181	205.14	5418.81	0.83	1698.91	2.64
2011	5,906,529,018	2209	267.38	6474.54	0.91	2284.49	2.59
2012	5,524,416,907	2233	247.40	7466.32	0.74	2720.07	2.03
2013	5,074,812,024	2264	224.15	8360.20	0.61	3067.12	1.65
2014	5,766,518,689	2298	250.94	9264.10	0.62	3317.79	1.74
2015	7,147,070,976	2360	302.84	9324.80	0.77	3804.87	1.88
2016	8,747,214,571	2398	364.77	9617.23	0.91	4138.25	2.11
2017	9,986,320,562	2445	408.44	10,920.09	0.91	4637.24	2.15
2018	13,105,220,578	2487	526.95	12,199.08	1.07	4985.57	2.63

Abbreviation: GDP, gross domestic product.

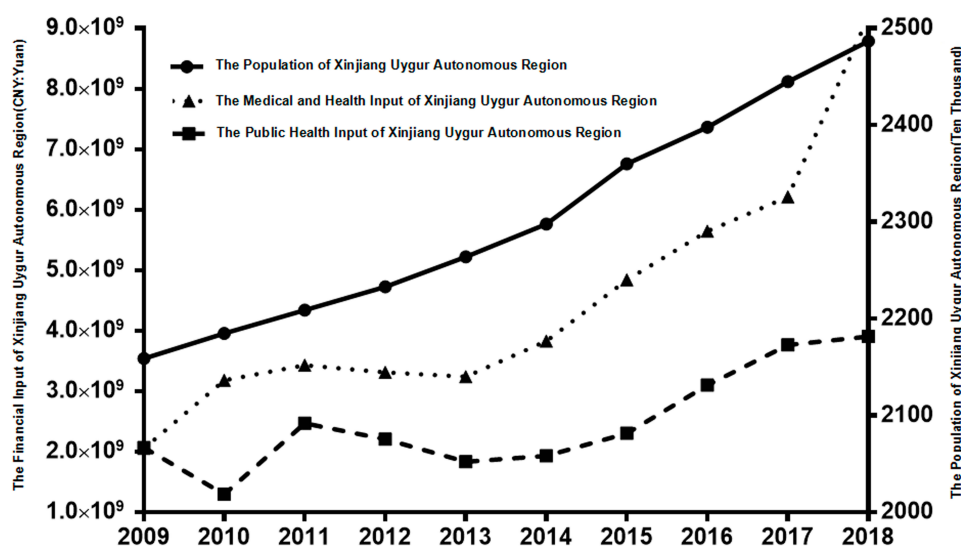
In addition, the Gini Coefficient of per capita government health expenditure between fourteen cities (states) of the autonomous region fell from 0.46 to 0.32 between 2014 to 2018 (Figure 3). Which meant not evenly distributed internally in 2014 and 2015, the per capita government health expenditure varied greatly in different cities (states) of Xinjiang. From 2016, per capita government health expenditure tended to average in different cities (states) of Xinjiang.

Distribution of Government Health Expenditure

Government health expenditure includes public health expenditure and medical institution expenditure. From

Tables 2 and 3 we could see, in the past 10 years, the total expenditure in public health and medical institutions was 24,897,529,507 Yuan and 44,968,381,544 Yuan respectively, while the ratio of the two decreased from 1.01 to 0.42, that was statistically significant ($\chi^2=5.728$, $P<0.01$).

In the past 10 years, the expenditure of medical institutions has increased from 2,056,890,435 Yuan in 2009 to 9,199,085,270 Yuan in 2018, with an average annual growth rate of 16.16%. In every item of primary expenditure invested by medical institutions, the total expenditure of public hospitals reached 31,666,540,702 Yuan, and with an annual growth rate of 13.16%, while the total expenditure of grassroots medical and health institutions reached

**Figure 1** A trend chart of the relationship between Xinjiang Uygur Autonomous Region population and government health expenditure from 2009 to 2018.

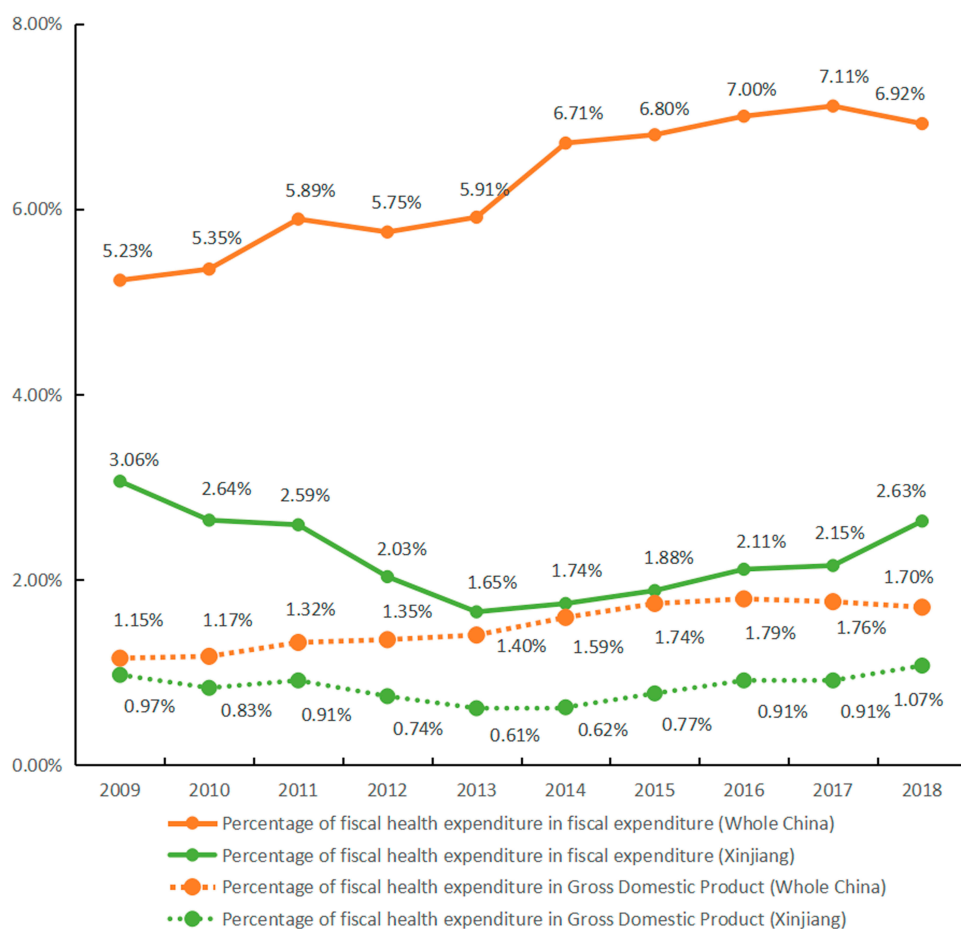


Figure 2 The proportion of fiscal health expenditure in gross domestic product (GDP) or total fiscal revenue in whole China and Xinjiang.

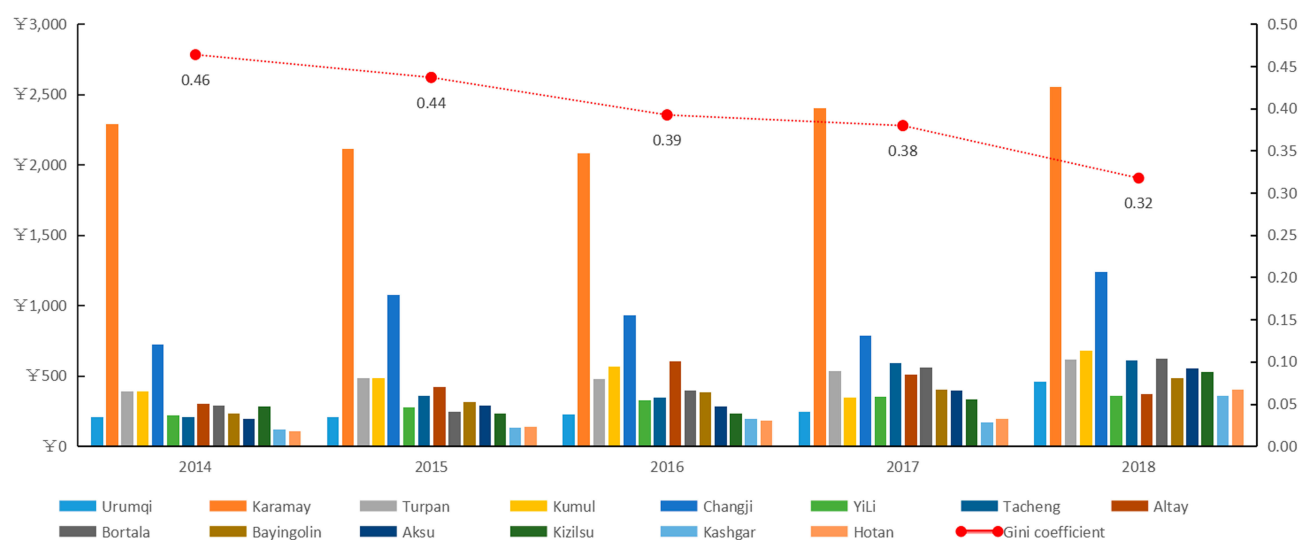


Figure 3 Gini Coefficient analysis of per capita government health expenditure between fourteen cities (states) of Xinjiang Uygur Autonomous Region. **Notes:** The left ordinate represents per capita health expenditure (Yuan); the right ordinate represents the Gini coefficient.

Table 2 List of Medical Institution Expenditure of Xinjiang Uygur Autonomous Region Government from 2009 to 2018 (Yuan)

	Public Hospitals			Primary Medical and Health Institutions			Total
	General Hospitals	Traditional Chinese Medicine Hospitals	Others	Urban Community Health Institutions	Township Hospital	Other basic Medical and Health Institutions	
2009	1,522,158,500	178,511,767	127,853,180	123,169,542	24,370,642	80,826,804	2,056,890,435
2010	1,899,480,165	237,286,341	97,867,381	326,323,179	312,808,545	308,781,955	3,182,547,566
2011	1,613,747,741	405,174,474	575,674,569	200,582,941	327,303,007	312,116,790	3,434,599,522
2012	1,695,419,648	319,853,135	268,093,436	206,835,471	583,627,042	242,533,797	3,316,362,529
2013	1,615,646,129	292,260,367	100,426,861	235,614,258	593,046,477	403,383,643	3,240,377,735
2014	2,087,193,864	445,009,489	105,508,019	219,856,553	628,899,196	345,984,647	3,832,451,768
2015	2,497,026,215	565,733,406	334,293,677	236,173,708	799,122,179	410,130,244	4,842,479,429
2016	2,527,057,547	730,539,115	789,148,891	255,064,799	992,308,480	352,394,292	5,646,513,124
2017	2,967,370,195	594,507,472	779,273,413	410,351,080	1,076,018,622	389,553,384	6,217,074,166
2018	4,496,036,022	734,955,460	1,063,434,223	496,039,262	1,990,631,414	417,988,889	9,199,085,270
Total	22,921,136,026	4,503,831,026	4,241,573,650	2,710,010,793	7,328,135,604	3,263,694,445	44,968,381,544

13,301,840,842 Yuan, and with an annual growth rate of 28.96%. However, in the secondary expenditure projects, the average annual growth rate of expenditure in general hospitals, traditional Chinese medicine hospitals, other public hospitals, urban community health institutions, township health centers and other grass-roots medical and health institutions in the past decade were 11.44%, 15.20%, 23.59%, 14.95%, 55.31% and 17.86%, respectively. At the same time, the percentage of each project in the total expenditure of medical institutions was 50.97%, 10.02%, 9.43%, 6.03%, 16.30% and 7.26%, respectively. Among them, the township hospitals had the highest average annual growth rate, with the total expenditure increased from 24,370,642 Yuan in 2009 to 1,990,631,414 Yuan in 2018; and the public hospitals accounted for the highest proportion, reaching 50.97%, with a cumulative expenditure of 22,211,260,600 Yuan over 10 years.

However, in the field of public health expenditure, the total expenditure increased from 2,068,527,828 Yuan in 2009 to 3,906,135,308 Yuan in 2018, with an average annual growth rate of 6.56%. In the expenditure items of public health expenditure, disease prevention and control institutions, health supervision agency, maternity and child care institutions, emergency treatment institutions, blood collection and supply institutions, other professional public health institutions, the basic public health services and other public expenditure accounted for 13.87%, 4.15%, 8.10%, 1.60%, 5.62%, 1.35%, 29.81%, 35.50%, respectively. The average annual growth rates of various

expenditures were 15.50%, -4.25%, 28.34%, -11.00%, -15.95%, -39.20%, 19.66%, and 11.37%. Among them, the maternal and child care institutions had the highest annual growth rate, and the expenditure of this project increased from 44,473,848 Yuan in 2009 to 539,366,541 Yuan in 2018.

Government's Health Expenditure in the Four Prefectures of Southern Xinjiang

Kashgar, Hotan, Aksu and Kizilsu Kirgiz Autonomous Prefecture are the four traditional Southern Xinjiang area in Xinjiang Uygur Autonomous Region, and also are the four most underdeveloped regions in Xinjiang. Thus, it was a great significance to analyze the health expenditure of the four prefectures in Southern Xinjiang. From Table 4, it could be seen that the health expenditure of the four areas in Southern Xinjiang increased from 807,957,961 Yuan in 2009 to 4,435,805,835 Yuan in 2018, with an annual growth rate of 18.57%; the proportion of the government's health expenditure increased from 19.58% in 2009 to 33.85% in 2018 for the whole autonomous region. Among them, the average annual growth rate of health expenditure of Kashgar, Hotan, Aksu and Kizilsu Kirgiz Autonomous Prefecture, respectively, were 18.20%, 23.55%, 16.89% and 16.20%, which were higher than the average annual growth rate of 12.25% in the whole autonomous region in the past decade. According to the census data in 2010, the total population of the four prefectures in Southern Xinjiang was 8,890,213, accounting for 40.76% of the total population of the whole autonomous region (21,813,334) at that

Table 3 List of Public Health Expenditure of Xinjiang Uygur Autonomous Region Government from 2009 to 2018 (Yuan)

	Disease Prevention and Control Agency	Health Supervision Agency	Maternal and Child Health Care Institutions	Emergency Treatment Institutions	Blood Transfusion Services	Other Professional Public Health Agencies	Basic Public Health Services	Other Public Health Agencies	Total
2009	166,696,476	172,801,660	44,473,848	87,301,695	840,308,145	161,743,712	203,211,682	391,990,610	2,068,527,828
2010	181,508,079	55,190,889	85,920,544	9,057,781	20,524,497	17,669,498	312,956,263	617,014,344	1,299,841,897
2011	239,558,060	200,508,996	211,881,424	131,472,550	55,417,235	110,865,485	472,253,809	1,049,971,938	2,471,929,496
2012	282,844,757	109,222,811	95,182,114	28,137,165	97,963,322	31,742,375	471,725,465	1,091,236,368	2,208,054,378
2013	256,267,478	68,682,142	117,330,423	58,171,093	30,963,817	8,752,936	656,925,348	637,341,052	1,834,434,289
2014	337,871,233	65,158,396	122,322,057	14,045,812	30,066,169	640,000	744,366,788	619,596,467	1,934,066,921
2015	326,695,857	76,657,777	240,317,427	10,059,572	36,493,146	1,548,916	940,201,651	672,617,202	2,304,591,547
2016	392,562,617	82,166,109	214,672,532	24,517,482	62,088,726	1,589,695	1,195,625,113	1,127,479,173	3,100,701,447
2017	564,905,886	91,666,721	345,642,859	7,593,924	78,047,698	458,400	1,200,999,054	1,479,931,853	3,769,246,396
2018	704,061,303	111,902,482	539,366,541	27,244,230	147,904,316	1,117,311	1,223,342,187	1,151,196,939	3,906,135,308
Total	3,452,971,746	1,033,957,983	2,017,109,769	397,601,304	1,399,777,071	336,128,328	7,421,607,360	8,838,375,946	24,897,529,507

Table 4 List of Public Health Expenditure of Four Prefectures in Southern Xinjiang from 2009 to 2018 (Yuan)

	Hotan	Kashgar	Kizilsu Kirgiz	Aksu	Total	Whole Xinjiang	Ratio(%)
2009	123,029,211	312,269,879	73,584,138	299,074,733	807,957,961	4,125,418,263	19.58
2010	205,231,569	383,818,011	61,970,142	381,542,707	1,032,562,428	4,482,389,463	23.04
2011	301,881,468	591,459,389	105,939,211	517,663,569	1,516,943,637	5,906,529,018	25.68
2012	233,178,947	492,102,815	96,723,208	409,890,574	1,231,895,545	5,524,416,907	22.30
2013	256,011,507	518,961,575	99,864,621	500,838,204	1,375,675,907	5,074,812,024	27.11
2014	248,925,891	543,393,306	169,562,927	492,776,594	1,454,658,718	5,766,518,689	25.23
2015	319,124,669	606,785,024	139,097,060	735,794,913	1,800,801,665	7,147,070,976	25.20
2016	444,281,767	883,169,903	140,298,757	708,804,751	2,176,555,179	8,747,214,571	24.88
2017	494,693,367	793,599,421	209,759,768	1,017,972,346	2,516,024,901	9,986,320,562	25.19
2018	1,019,649,367	1,662,155,469	330,305,593	1,423,695,406	4,435,805,835	13,105,220,578	33.85
Total	3,646,007,764	6,787,714,793	1,427,105,424	6,488,053,795	18,348,881,776	69,865,911,051	—

time, which was far higher than the proportion of medical and health expenditure ($\chi^2=7.445$, $P=0.006$). It showed that the government's health expenditure in the four prefectures of Southern Xinjiang still needed to be strengthened, though Aksu and Kizilsu Kirgiz Autonomous Prefecture due to their small population, has reached the average level of Xinjiang Uygur Autonomous Region (Figure 3).

Discussion

The Shortage of Autonomous Region Government's Overall Financial Expenditure on Health Expenditure Remains to Be Further Strengthened

During the first 10 years since Chinese new medical reform, although the health expenditure of the all levels governments in the autonomous region has been

increasing, and the proportion of this expenditure in the GDP of the whole region has also been increasing (that have reached 1.07%), the annual average growth rate has also reached 12.25%, which was higher than the annual growth rate of 11.06% of the total GDP in the same period, compared with the overall level of the country, there was still a certain gap. Guo Feng⁷ reported that since the 18th National Congress of the Communist Party of China, the annual growth rate of Chinese government's health expenditure has been 12.52%, so the expenditure growth rate in Xinjiang was similar to that of the whole country. The national government's health expenditure has reached 1.70% of the total GDP of 2018, while the proportion in Xinjiang had only reached 1.07% in 2018, which was far below the national average level. So there was plenty of fiscal space for health to increase. The WHO offered seven options to increase in fiscal space for health, including

reprioritizing expenditure, Raising revenue, boosting efficiency, increasing borrowing, securing more external grants, monetary expansion and conducive overall macro-economic conditions in 2017.⁸ Xinjiang as a remote economically underdeveloped area only could increase in fiscal space for health by reprioritizing health expenditure and securing more external grants from the advanced regions of China.

Meanwhile, the government per capita expenditure on health in the whole of China and the western region has reached 1093.88 Yuan and 1139.53 Yuan, respectively, in 2017, while that in Xinjiang only reached 526.95 Yuan in 2018, less than half of the national level. Compared with Inner Mongolia Autonomous Region, the proportion of government health expenditure in Xinjiang was still less. According to Wenlan reported,⁹ the government health expenditure in Inner Mongolia accounted for 1.36% of the total GDP in 2014, and 6.27% of the local financial expenditure, which both were higher than those in Xinjiang. However, compared with the Inner Mongolia Autonomous Region, the per capita government health expenditure was not much different, less than 50% of the national average.

Therefore, in terms of the situation of the whole country and other provinces, the government's health expenditure in Xinjiang Uygur Autonomous Region still had a large space to increase.^{10,11} In addition, from the perspective of realizing the 13th five-year plan of health development and building a well-off society in an all-round way in 2020, this paper examined the current situation of government health expenditure in Xinjiang, the government health expenditure was also an urgent work. Thus, it was still necessary for governments at all levels in Xinjiang to continue to increase the intensity of government health expenditure, and to effectively guarantee the increasing intensity of government health expenditure through laws and regulations, then they could strive to reach the overall level of the country as soon as possible.

The Structure of Government Expenditure on Health Needs to Be Improved

During the 10 years of the new medical reform, the government's financial expenditure in medical institutions and public health agencies has changed significantly. Because it benefited from the new model of medical reform, the proportion of government financial expenditure in medical

institutions has been continuously strengthened, which have been accounted for 70.22% of the total government expenditure in 2018. And the average annual growth rate was also as high as 16.16% during the 10 years, far higher than the average annual growth rate of 5.65% in the field of public health. These data indicated that the universal health insurance model plays an important role in the government's health care expenditure. However, the proportion of medical institutions in Xinjiang compared to the national level was relatively high, the overall national level was about 45%, which was far lower than the level of 70.22% in Xinjiang. The primary reason was that there was a large number of farmers and herdsmen in Xinjiang, whose medical insurance reimbursement ratio was much higher than that of the general population. Secondly, a series of medical insurance reimbursement policies for the elderly issued by the Autonomous Region Government have improved the reimbursement ratio of the elderly. Finally, because of the relatively backward medical and health conditions, the prevalence of major diseases and chronic diseases in Xinjiang was higher than the national level, thus leading to a heavier burden on health care. All of these reasons lead to the government health expenditure concentrate on major hospitals, thereby reducing the government financial expenditure in public health.¹² Because the government public health expenditure has been compressed, many diseases could not be effective in preventing, which leads to the incidence of various major diseases and chronic diseases can not effectively reduce, and thus forming a vicious cycle. That was to say, because the proportion of government public health expenditure was reduced, it could not do better in disease prevention, and could not effectively enhance the concept of universal health. This was why the incidence of various diseases is so high. The more money needed for personal health care, the more the government will invest in personal health care, which leads to a further squeeze on public health funds. In order to break up this vicious circle, a reasonable plan of government health expenditure must be established, balance the proportion of medical institutions and public health expenditure, and appropriately increase the annual growth rate of public health expenditure, so as to reach a reasonable proportion of expenditure as soon as possible.

In the past 10 years, the total expenditure of public hospitals was 2.38 times of primary medical and health institutions, which showed that it was still a long way to implement Premier Li Keqiang's important instructions on

strengthening the primary level of medical reform in Xinjiang Uygur Autonomous Region. However, it was gratifying that in the past decade, the annual growth rate of expenditure in primary medical institutions has been as high as 28.96%, far higher than the average annual growth rate of 13.16% in public hospitals, which made us believe that in the fact the expenditure in primary medical institutions will surpass public hospitals in the future. By analyzing the input data of grass-roots medical institutions, it also was found that the expenditure of township health centers has been continuously strengthened. In the past decade, the financial expenditure of township health centers was 2.70 times than urban community health institutions, and the annual growth rate was as high as 55.31%, far higher than the 14.95% annual growth rate of urban community health institutions, it showed that the government finance of Xinjiang Uygur Autonomous Region has paid more attention to rural medical institutions. The support of health care, especially township hospitals, is in line with the policy that the new medical reform of the country inclines to the medical and health expenditure in rural areas.

The Health Expenditure of Four Prefecture in Southern Xinjiang Has a Long Way to Go

The government expenditure on medical and health care in the undeveloped and remote areas has always been a difficult problem.¹³ The four prefectures in Southern Xinjiang are the areas with backward economy, poor health conditions and a large proportion of minority population in Xinjiang. The status of medical and health level in this area plays a role of cask effect on the overall medical and health level in Xinjiang to some extent. Through the analysis, it could be found that, although the annual growth rate of the government's medical and health expenditure in the four southern regions was as high as 18.57%, which was higher than the overall annual growth rate of 12.25% in Xinjiang, but because the baseline level before the medical reform was too low, the current level of the government's medical and health expenditure in Kashgar and Hotan was still far lower than the level of the whole autonomous region, even very far from the national average level. The main reason for this phenomenon is that the economic level of Southern Xinjiang prefectures is too backward, and the financial revenue of the local government was limited. The funds invested in the local areas mainly came from the transfer

of financial funds from the central government and the autonomous region, as well as financial assistance from some provinces and cities of the Chinese developed area. How to solve this problem is mainly to obtain more input subsidies from the central finance and the autonomous region's finance for local medical and health care through multiple channels, so as to increase the level of local medical and health expenditure, improve the local medical and health conditions, and realize the grand blueprint of all the people in Xinjiang Autonomous Region to enter the well-off society in 2020.

Conclusion

In the first decade of the new medical reform, restricted by the regional economic conditions and social reality, the financial expenditure of Xinjiang Uygur Autonomous Region government to medical and health care was generally less, especially in the four prefectures of Southern Xinjiang such as Kashgar and Hotan, at the same time, the expenditure of medical institutions and public health is unbalanced. So the governments at all levels of the autonomous region should continuously strengthen the financial expenditure in medical and health care, maintain the current situation of better implementation of the policy for inclining to rural and grass-roots expenditure, constantly optimize the proportion of various financial expenditures. Strive to achieve the general goal of social stability, long-term stability and stability in Xinjiang Uygur Autonomous Region, and strive for all ethnic people in Xinjiang to enter a well-off society in an all-round way.

Funding

The study was funded by the National Natural Science Foundation of China (No.71662033).

Disclosure

The authors declare that they have no competing interests.

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